CRAIG YR HESG QUARRY

Section 73 Time Extension

Environmental Statement

Volume 1

May 2021

ENVIRONMENTAL STATEMENT

VOLUME 1

CRAIG YR HESG QUARRY

Section 73 Application for Time Extension

Client: Hanson
Job no. 407.00027.00518
Document title: Environmental Statement Volume 1
Status: Final
Date: 17 05 21

Ref: ES

CONTENTS

CONTENTS

CONTENTS

CONTENTS

TABLES (within ES Volume 1)

FIGURES (within ES Volume 1)

APPENDICES (ES Volume 2)

CONTENTS

APPLICATION PLANS

1.0 INTRODUCTION

1.1 Background

This Environmental Statement (ES) sets out the results of an Environmental Impact Assessment (EIA) which has been undertaken to accompany a 'Section 73' planning application, submitted to Rhondda Cynon Taff County Borough Council (RCT), which seeks permission to continue the operation of Craig yr Hesg Quarry (the Quarry) without complying with the current time limit planning conditions for quarrying which expires on 31st December 2022. For the reasons set out below, the application seeks to extend the time limit for quarrying by 6 years to 31st December 2028.

A 'Section 73' application is derived from Section 73 of the Planning Act 1990, which allows applications to be submitted to continue a development without complying with a condition subject to which a previous permission was granted. In this case the application relates to conditions 1-4 of an Environment Act 1995 'Review of Old Mining Permissions' commonly referred to as a ROMP Review of conditions, issued by RCT on 24th April 2013 (ref 08/1380/10) which collectively seek to impose time limits in the carrying out of the development. The dates stipulated in Conditions 45 and 46 relating to restoration will also need to change to 31st December 2028 and 31st December 2030 respectively.

Condition 1 states:

"*This consent for the winning and working of minerals or depositing of mineral waste shall expire on 31st December 2022".*

Condition 2 states:

"Following the expiry of the planning consent all extraction, processing and stockpiling of minerals and depositing of mineral waste shall cease".

Condition 3 states:

"*No later than 12 months following the expiry of the planning consent, or the earlier permanent cessation of winning and working of minerals, as agreed between the mineral operator and the Local Planning Authority, all plant, machinery, hard standings, ancillary workshops, buildings, structures or other works associated with the development shall be dismantled and removed from the site unless otherwise agreed in writing with the Local Planning Authority".*

Condition 4 states:

"No later than 12 months following the expiry of the planning consent or the earlier permanent cessation of winning and working of minerals, as agreed between the mineral operator and the Local Planning Authority, the sale and transportation of any residual stocks shall cease."

Condition 45 requires that not later than 31st December 2022 the operator shall submit for the written approval of the Local Planning Authority a detailed final restoration scheme, with condition 46 requiring that the approved scheme shall be fully implemented within 2 years of the date of approval or by 31st December 2024, whichever is the sooner.

These conditions form part of the suite of 49 conditions set out in a schedule which now applies to the four historical permissions in place at Craig yr Hesg Quarry granted in 1949, 1965, 1970 and 1993. The quarrying time limit is consistent with the time limit end date referred to on the 1993 permission and was not altered as part of the ROMP Review.

The underlying reason for not seeking a change to the quarrying end date as part of the ROMP Review was that in May 2015 a planning application was submitted for a western extension to the Quarry and the consolidation of the existing permissions into one overall permission covering the existing quarry and extension area. The application included a request for an extension of the current December 2022 end date for quarrying as part of a proposal for the extraction of an additional 10 million tonnes of sandstone, together with the extraction of the remaining reserves in the existing quarry. If permission had been granted, this would have superseded the current ROMP schedule of conditions, and the quarrying end date which is included in that schedule as condition 1.

However, in July 2020, RCT refused planning permission for the western extension development (and indirectly the associated time limit extension). An appeal against that decision was lodged in December 2020, and the matter will be determined by the Planning Inspectorate in due course.

In the meantime, there are remaining reserves at the Quarry of some 3.3m tonnes as at 31st December 2020. Assuming a continuation of recent sales of 400,000 tonnes per annum, the existing reserves would provide a remaining life of some 8 years i.e., some 6 years beyond the current end date of December 2022. It also follows that in the absence of a permission to extend the life of the quarry by the requested 6 years, a reserve of some 2.5m tonnes would remain unworked at the quarry as at December 2022.

If the appeal against the refusal of the western extension development is allowed, then the time limit issue will have been resolved by that means. However, as a contingency, and to avoid the sterilisation of much needed currently permitted reserves, an application is being submitted to extend the current time limit to allow for the extraction of the remaining permitted reserves.

The Quarry has been in existence since the late 1800's and has been operated in its current form for several decades. The Quarry has reached its full lateral and depth limits, and a phased quarry development scheme and restoration strategy (via the ROMP Review) is in place. No changes are proposed to the approved quarry development and restoration scheme. Similarly, no changes are proposed to the current working practices or processing arrangements, or to the controls on the plant separately in place via an Environmental Protection Act Permit

The existing planning conditions imposed via the ROMP Review have been deemed adequate by RCT to regulate the ongoing operation, and other than conditions 1-4 (and consequential changes to conditions 45 and 46), it is not proposed to seek to amend any of the other existing planning conditions. The existing planning conditions which regulate hours of working, noise, blasting, dust and air quality, and surface water and groundwater protection would thus be unchanged and would remain in place to regulate the operation for the additional timescale requested.

1.2 The Application Site

The application site represents the boundary of the permitted 'mining site' as defined in the ROMP Review application and schedule of current planning conditions. The defined 'mining site' is based upon a combination of four mineral extraction planning permissions as shown edged Red on Application Plan CYH 2 issued in 1949 (ref 5183); 1965 (ref P22/Z/596); 1970 (ref 349/Z/970); and 1993 (ref 56/86/0827). It includes peripheral woodland along the southern, eastern and north western sides of the plant site, and to the north of the main quarry area, together with a more substantial area of scrub woodland to the south west of the quarry as illustrated on the aerial photograph produced as plan ref CYH3. These areas do not form part of the operational area and would not be disturbed as part of the ongoing development. There are also some very small areas at the periphery of the site which appear to now form part of residential dwellings and/or small businesses unconnected with the Quarry and which are not part of the operational area.

In practical terms the operational quarry area includes other areas which have been historically quarried and or disturbed as part of the quarrying operations. These areas are apparent from the aerial photograph plan ref CYH3, including land to the immediate west of the plant site. No further quarrying operations will take place outside the defined quarrying area shown on plans CYH5 and CYH6, but the EIA has considered the quarrying and related operations within the overall footprint of the existing disturbed quarry area, together with the restoration of that overall area.

For the avoidance of doubt, the application site does not include the separately proposed western extension area, and this would not be permissible procedurally given that the application is confined to seeking to amend a planning conditions (time limit) associated with the permissions by virtue of the ROMP schedule of conditions which apply at the Quarry.

Again, for the avoidance of doubt, the application site does not include the main access to the Quarry, which is permitted pursuant to planning permission reference 13/1039/10.

The Quarry itself is situated on the western side of the Taff Valley, some 1km north of the built-up area of Pontypridd. The village of Glyncoch lies beyond the northern boundary of the quarry. Locally, the Quarry is bounded to the north by the Glyncoch football ground and clubhouse; to the west / northwest by grazing land which comprised the separately proposed western extension area; to the southwest by the prominent wooded ridgeline of Coed Craig yr Hesg, which overlooks the town of Pontypridd; and to the east by a narrow corridor of woodland between the site and the B4273 Ynysybwl Road.

The quarry processing plant in the eastern area of the site comprises a crushing and screening plant and asphalt plant. The main quarry area lies to the west, with a series of quarry faces and benches which are being developed in a general north-westerly direction within the limits of the planning permission.

1.3 Planning and EIA Context

The most recent planning permission for quarrying was granted in August 1993, which included a time limit for quarrying to December 2022, and which, as noted above, was carried forward via the ROMP Review. The planning permission (reference 56/86/0827) was accompanied by a Section 106 legal agreement which, inter alia, provided for the relinquishment of the right to quarry and remove vegetation from a defined area of land to the south of the quarry, thereby protecting the integrity of the Craig yr Hesg ridgeline above Pontypridd.

In July 2010, an ES was submitted in support of a ROMP Review application which considered the environmental effects of the ongoing quarry operation, and which via recommendations made in the ES, provided a context for the drafting of updated planning conditions. The EIA which formed the basis of the ES was informed by an EIA scoping opinion issued by RCT in July 2009 which confirmed the issues which should be assessed as part of the EIA.

An updated schedule of planning conditions was issued in April 2013, and the requirements of those conditions provide the controls which regulate the current operation. Importantly, in determining the ROMP application, and issuing the schedule of updated conditions, RCT were satisfied that the conditions imposed were adequate to regulate the ongoing operation, and that they could be enforced to ensure compliance with the respective requirements. RCT raised no issues which suggested that the quarry development was unacceptable which would require either restrictions or modifications to the terms of the existing permission. The updated conditions simply reflect modern standards, updated from the controls exercised via conditions imposed on the 1993 permission.

The May 2015 western extension application was similarly informed by an EIA, the results of which were included within an ES which accompanied the application. That EIA was similarly informed by a formal EIA 'scoping opinion' issued by RCT in November 2014. Whilst the EIA studies reported in the 2015 ES were largely focused on the environmental effects of operations within the proposed western extension area, they also dealt with the ongoing operations within the existing quarry as part of the consolidation application and the consideration of the environmental effects of the overall project. This included the effects of noise, blast vibration, dust and air quality and traffic associated with ongoing operations within the existing quarry together with the effects of such operations within the proposed extension area.

As noted above, the application for a western extension was refused (and an appeal has been lodged), but it is noteworthy that the reason for refusing the application was confined to effects associated with development within part of the extension area, and no issues were raised in the refusal notice regarding the effects of the ongoing quarrying and processing operations within the existing quarry. It is also apparent that the RCT officers were content that the ongoing operation could continue to be satisfactorily regulated by planning conditions, as evident from the schedule of planning conditions which accompanied the Planning Officers Reports to Committee (February and July 2020) which generally mirrored the controls set out in the ROMP schedule in terms of the conditions relevant to the existing quarry as opposed to the proposed extension area.

In this context, the key focus of the EIA undertaken in support of the Section 73 application, and reported in this ES, is on establishing whether the existing environmental and amenity controls imposed as planning conditions via the ROMP Review remain appropriate for the extended duration of the operation, or whether additional or amended controls are required.

Finally, in view of the fact that EIA's have been undertaken in 2010 in support of the ROMP application, and in 2015 in support of the western extension application (both informed by formal EIA scoping opinions), it has not been deemed necessary to seek a formal 'scoping opinion' from RCT as to the issues which should be addressed as part of the current Section 73 application EIA. The issues are well known from the previous EIA's, and the same topics are addressed and reported in this ES.

1.4 Section 73 Time Extension Application

The application is a straightforward request to continue the currently permitted development without complying with conditions 1-4, set out at paragraph 1.1 above:

[1] The winning and working of minerals and the depositing of mineral waste shall cease by 31st December 2028.

[2] No processing or stockpiling of minerals shall take place after 31st December 2028 or, if sooner, the permanent cessation of the winning and working of minerals.

[3] No later than 31st December 2029 or the expiry of 12 months following the permanent cessation of the winning and working of minerals and the depositing of mineral waste, whichever is the sooner, all plant, machinery, hard standings, ancillary workshops, buildings, structures or other works associated with the development shall be dismantled and removed from the site unless otherwise agreed in writing with the Local Planning Authority.

[4] No later than 31st December 2029 or the expiry of 12 months following permanent cessation of the winning and working of minerals and the depositing of mineral, whichever is the sooner, the sale and transportation of any residual stocks from the site shall cease.

[45] No later than 31st December 2028 or the expiry of 6 months following the permanent cessation of the winning and working of minerals and the depositing of mineral waste, whichever is the sooner, the operator shall submit for the written approval of the Local Planning Authority a detailed final restoration scheme, including drawings to illustrate the proposals for the final restoration of the quarry. The final restoration scheme shall be based upon the restoration concept plan ref CYH7, and include, inter alia, the following matters:……(list of matters unchanged from current condition 45).

[46] The scheme detailed in condition 45 above shall be fully implemented within two years of the date of approval of the scheme or by 31st December 2030, whichever is the sooner, unless otherwise agreed in writing by the Local Planning Authority.

No changes are proposed to any of the remaining existing planning conditions and in particular, as described in chapters 3.0 and 4.0 below, no changes are proposed to the approved working and restoration scheme. It follows that no changes are proposed to the current quarry working and processing arrangements, to the pattern of output, or to the hours of working: the change is confined solely to the time limit to allow the remaining permitted reserves to be worked, and to avoid what would otherwise be an unnecessary sterilisation of permitted reserves.

1.5 Environmental Impact Assessment (EIA)

The EIA has drawn upon the context and content of the EIAs and ES's undertaken in connection with the 2010 ROMP Review application and the 2015 western extension application, with updates to five key topics to reflect current circumstances, namely:

(i) Landscape and Visual effects, noting the physical and landscape changes which have occurred to the existing quarry since the 2010 ES, with a review to establish whether the visual assessment of the then anticipated changes undertaken in 2010 remains accurate.

(ii) Ecology, with an update of the ecological surveys undertaken in 2009, 2014 and 2018, focused on any material changes in the ecology of the existing quarry which would be relevant to a continuation of operations for an extended time period.

(iii) Noise, noting that the existing operations are subject to noise limits as measured at defined properties, and where the key focus of the current study is on establishing whether these existing noise limits remain appropriate (including drawing upon the results of noise monitoring as required by the ROMP conditions), or whether revised limits should be applied for the extended duration of the operations.

(iv) Dust and Air Quality, again noting that dust control measures are in place via existing planning conditions and via separate controls imposed on the Environmental Permit, but where over the intervening period since the 2015 ES there has been ongoing air quality monitoring in the locality undertaken by both Hanson and RCT, the results of which are considered as part of the current EIA; and

(v) Traffic, where a traffic survey was undertaken as part of the 2015 EIA, which has been updated via a traffic survey undertaken in 2020 with additional commentary to reflect current circumstances and the requested extended time period.

Other topics which were addressed in the previous EIA's are briefly addressed in the current ES, but it has not been deemed necessary to commission fully updated studies of these topics on the basis of the following:

(i) Blast Vibration. Limits on ground vibration from blasting are prescribed by the existing ROMP Review planning conditions, together with other blast control measures. These limits comply with current guidance issued by Welsh Government, and there would be no basis for revising such limits for the extended duration of the operation. A brief overview chapter is thus provided, confirming that all blasts are routinely monitored, and all blasts are shown to comply with the ground vibration limits in place.

(ii) Hydrology and Hydrogeology. The quarry has reached the full extent of its permitted lateral and depth limits, and the remaining operation will be confined to working the existing middle and lower benches to their final positions, within this defined footprint. It follows that there would be no changes to surface water patterns arising from the remaining development, and no effects on groundwater which lies below the permitted base level of the quarry.

(iii) Cultural Heritage. The quarry has reached its full lateral limits, and all land within the footprint of the quarry operational area has been disturbed. It follows that no features of archaeological interest remain within the defined area, and any indirect effects on the settings of any cultural heritage features in the wider locality will not change and have been deemed acceptable by virtue of the previous planning permissions.

During the processing of the 2015 western extension application, it was agreed with RCT that the Applicants would provide a report setting out a 'Response to Public Consultation Well-Being and Environmental Health Issues'. This report was submitted in June 2016 and set out a response to concerns which had been raised by interested parties relating to potential noise, blast vibration, air quality and other amenity / environmental health issues, together with comments on the amenity and economic benefits which the scheme would have delivered. For consistency, a similar commentary on socio economic, wellbeing and health issues is included as a separate chapter in this ES which draws upon the conclusions of the updated studies referred to above and provides an update on the socio-economic benefits associated with a continuation of the development for the requested extended period.

1.5.1 Technical Studies

In the context of the above, the updated technical studies reported in this ES have comprised the following:

- Landscape and Visual Impact and Restoration Design – SLR Consulting Ltd;
- Ecology – SLR Consulting Ltd;
- Noise – WBM;
- Air Quality – Smith Grant LLP;

- Traffic – Hurlstone Partnership; and
- Socio-economic, well-being and health issues – RPS Consulting.

The EIA and preparation of the ES has been coordinated by SLR Consulting. SLR is a member of the Institute of Environmental Assessment and Management with an awarded 'Quality Mark' and has specialist capability in mineral planning.

SLR were responsible for producing the 2010 and 2015 ES's and this continuity and background is re-enforced by the involvement of other technical members of the EIA project team who have similarly been responsible for inputs into the previous EIAs and ES's.

A Statement of Experience of the consultant team involved in undertaking the EIA is included with the application documents.

1.6 The Environmental Statement

The ES has been prepared to fulfil the requirements set out in the Town and Country Planning (Environmental Impact Assessment) (Wales) Regulations 2017 regarding the content of environmental statements (Schedule 4).

It has a clear structure and reads as a concise single document. It is sub-divided into a number of Chapters, namely:

1.0 **Introduction** which sets out the background to the EIA and the preparation of the ES.

2.0 **The Application Site**, which provides a summary baseline description of the site from which the environmental effects of the development are assessed.

3.0 **The quarry development**, which describes the details of the phased quarry development scheme.

4.0 **The Restoration Strategy**, which provides a description of the concept for the restoration of the overall site upon cessation of quarrying.

5.0 - 13.0 **Environmental effects and mitigation measures**, which in the context of section 1.5 above describes in a proportionate way the potential effects of the ongoing development under the sub-headings of landscape and visual effects (6.0); ecology (7.0); hydrology / hydrogeology (8.0); noise (9.0); blast vibration (10.0); dust / air quality (11.0); traffic (12.0); and cultural heritage (13.0).

14.0 **Socio Economic, Well-Being and Health effects**, which draws upon the findings of the 'environmental health effect' studies in preceding chapters and sets these into a context of effects and benefits associated with the ongoing development.

15.0 **Summary of Environmental Issues**, which draws upon the content of preceding chapters in identifying the principal findings and conclusions.

16.0 **Planning Policy**, which provides a commentary on relevant planning policy.

17.0 **Conclusions**, which provides a general overview of the EIA, and the key conclusions which are reached.

The ES seeks to provide an objective account of the environmental effects of a continuation of the quarry development for the requested extended time period. It draws upon the details of the currently approved quarry development and restoration scheme, which it is not proposed to change, and focuses on the environmental and amenity effects of a continuation of that scheme for the requested extended period, together with the consequent delay in the delivery of the approved restoration scheme.

The 'baseline' for the assessment has, where appropriate, considered a scenario whereby quarrying operations have ceased (as would be the case in December 2022 based upon the current planning conditions), and a baseline

associated with a continuation of quarrying and related operations as part of an existing baseline movements (noting that the Quarry has been in existence in its current form for many decades and might thus be regarded as an existing 'baseline'). Comments are thus made, where appropriate, regarding the contribution to the baseline environmental which may be attributable to the quarry and which might be removed in a 'no scheme' world.

1.7 Submitted Documents

The aims of the statement are to:

- Describe the baseline conditions at the site, and in terms of the defined EIA topics, to identify, where applicable, the environmental control measures which are in place.
- Describe the details of the ongoing development, noting again, that there are no proposals to amend the currently approved quarry development and restoration scheme, or any elements of the existing working practices, unless additional mitigation measures are identified and recommended through the EIA process.
- Consider the environmental effects of the development, which, as a continuation of an existing scheme are definable and measurable and are subject to existing controls.
- Describe the measures which are in place to mitigate the effects, with the identification of any additional mitigation measures which might be required to be implemented for the extended duration of the development.
- Assess the likely effectiveness of the mitigation measures, noting that the measures which are in place via the ROMP review were deemed by RCT to be adequate to mitigate the effects of the development within the timescale of the approved development.
- Draw conclusions regarding the effects, with particular reference to whether the effects can continue to be adequately mitigated for the requested extended duration of the development.

The ES (Volume 1) draws together the inputs from the specialist technical consultants who have undertaken the EIA and is intended to be a self-contained document which covers all relevant topics. It does however cross-refer to a number of background documents and technical appendices prepared by the consultant team, which have been bound into Volume 2. The appendices have been numbered to accord with the ES chapter number such that, for example, appendices accompanying the Noise Chapter 9.0 are numbered 9.1- 9.8.

The ES reproduces a series of figures which have been prepared by the EIA project team as part of their inputs into the ES. These are referred to within the respective chapters of the ES and follow the chapter numbering sequence of the ES, such that, for example, figures within Chapter 6.0 are numbered 6.1 – 6.9. The respective figures are produced either within the chapter or in the appendix accompanying the technical study and chapter. A full list of figures included within the ES Volume 1 is provided within the contents schedule of the ES.

A Non-Technical Summary of the ES has been prepared as a separate document (Volume 3) as a means of enabling the findings and conclusions of the ES to be more readily understood.

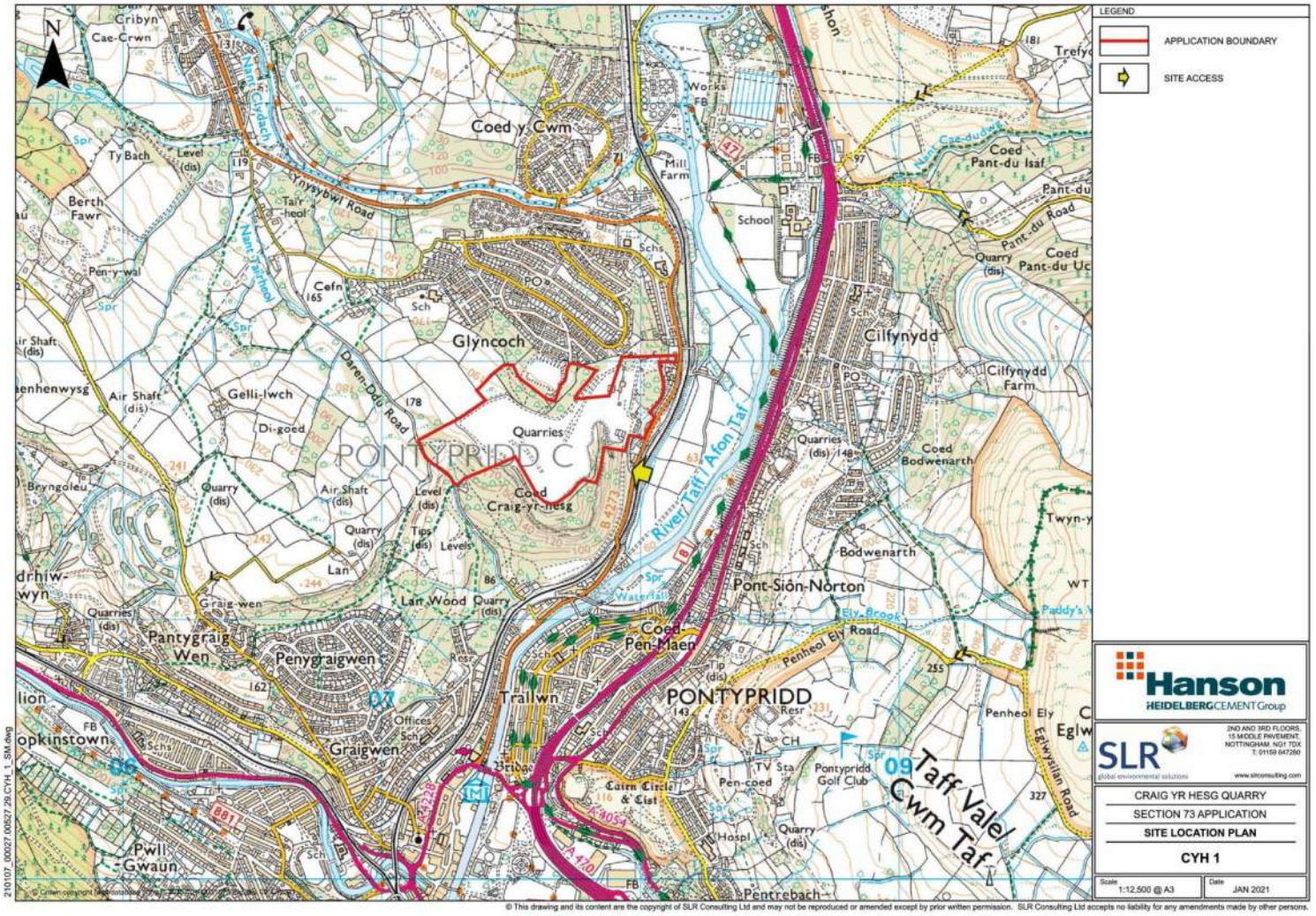
A series of quarry development and restoration plans have been prepared to accompany the application. These plans follow the principles of the approved ROMP scheme but have been updated from the plans prepared in 2010 to reflect the passage of time and to show the current circumstances at the quarry and the remaining area to be worked.

A description of the scheme illustrated on these plans is provided within Chapters 3.0 and 4.0 of the ES, which again follows the principles of the approved ROMP scheme. The working and restoration scheme, as described, forms the basis for the technical assessments undertaken as part of the EIA and reported in this ES.

For completeness, the ES also includes a review of policy in the local development plan, national planning policy, and the context provided by the Regional Technical Statement (Second Revision 2020) which sets the

parameters for the contribution to be made by RCT towards regional supplies of crushed rock aggregate.

Figure 1-1 Site Location



INTRODUCTION 1

2.0 THE APPLICATION SITE

2.1 Application Site

Craig yr Hesg Quarry comprises two main areas with the processing plant site situated in the east, with the quarry access of the B4273 south of the plant site, and the main quarry area in the central and western areas of the site linked to the plant site by a narrow cutting and access road at the plant site level, and by a higher-level haul road which provides access to the primary crushing plant at the northern end of the plant site.

The plant site itself comprises a series of crushers and screens with conveyors to aggregate vehicle load out points and storage areas, together with a separate asphalt plant which produces coated roadstone for highway construction and maintenance. The plant site also includes related stockpile areas and surface water drainage infrastructure, together with the site offices, weighbridge, and a staff and visitor parking area.

The main quarry void comprises a series of faces, benches and haul roads at varying levels, together with locations for the disposal of quarry waste and the storage of quarry fines generated as part of the processing operation. The quarry area is essentially devoid of vegetation, but with some natural recolonisation on the worked out upper faces along the southern side of the quarry.

The application site represents the boundary of the permitted 'mining site' as defined in the ROMP Review application and schedule of current planning conditions. The defined site is based upon a combination of four mineral extraction planning permissions and includes peripheral woodland along the southern, eastern and north western sides of the plant site, and to the north of the main quarry area, together with a more substantial area of scrub woodland to the south west of the quarry as illustrated on the aerial photograph produced as plan ref CYH3. These areas do not form part of the operational area and would not be disturbed as part of the ongoing development.

In practical terms the operational quarry area includes other areas which have been historically quarried and or disturbed as part of the quarrying operations. These areas are apparent from the aerial photograph plan ref CYH3, including land to the immediate west of the plant site. No further quarrying operations will take place outside the defined quarrying area shown on plans CYH5 and CYH6, but the EIA has considered the quarrying and related operations within the overall footprint of the existing disturbed quarry area, together with the restoration of that overall area.

2.2 Landscape Context

The landscape character of the area is strongly influenced by the pattern of topography with steep, wooded valley side slopes rising from the valley floor. The main topographical feature in the area, the River Taf valley, is defined by Cefn Eglwysilan to the east which rises to a height of 382m AOD. Land to the west of the valley rises to over 240m AOD. The hilltops and ridgelines are typically agricultural pasture with either small scale fields or large, open areas with no enclosure. The enclosure field pattern is common throughout the upland area to the west of Craig yr Hesg quarry, while extensive areas of open land occur at Cefn Eglwysilan. Fields have a variety of boundary types including tall, overgrown and discontinuous hedgerows, fences and dry stone walls. The levels of maintenance for walls, hedges and fences vary considerably between areas.

Hedgerow trees, small areas of woodland and larger blocks of deciduous woodland on valley side slopes are characteristic of the area. Coed Craig yr Hesg, adjacent to the southern boundary of the Quarry, is a densely wooded ridge rising from the valley floor at around 80m to a height of 200m AOD. Part of the woodland is a designated Local Nature Reserve and includes a section of the 'Pontypridd Circular Walk'.

There are no public rights of way links from Glyncoch westwards into open countryside. The nearest public route in the vicinity of the site is Darren Ddu Road, a track which is impassable to vehicles, running generally north – south from Ynysybwl Road to the south west of the existing quarry, northwards to Ynysybwl. Public footpaths cross agricultural pasture land to the west of

Darren Ddu Road and connect with the minor road between Penygraigwen and Llanwonno.

Land designated as open access by the CROW Act includes large areas of Urban Common to the east at Cefn Eglwysilan and north-east at Craig-Evan-Leyshon Common. To the north and west are areas of Public Forest and to the south much smaller areas of open country access land lie adjacent to the settlement of Pontypridd.

Other public routes within the study area defined in ES Chapter 6.0 include the National Cycle Route 8 'The Taff Trail' which follows the river north from Pontypridd to Abercynon and is at its nearest at 350m to the east of the quarry. National Cycle Route 47 'The Celtic Trail' follows the minor road north west from Penygraigwen at a distance of 1km at its nearest point from the quarry with a separate branch of The Celtic Trail connecting Ynysybwl to the Taff Trail, running to the north of Glyncoch, some 650m from the site.

The Taff Trail long distance footpath follows the line of National Cycle Route 8 to the east of the quarry. Further east the Rhymney Valley Ridgeway Path runs north from Mynydd Meio to Nelson.

2.3 Ecology

The site comprises an active sandstone quarry which has been worked (in terms of habitat losses and overburden removal) to its full permitted lateral and depth limits, although a degree of extraction remains to achieve final face positions. As such, the majority of the site comprises active mineral extraction and processing areas with only minimal vegetated areas associated with the periphery of the quarry void and self-sown scrub which has established on internal bunds.

Craig-yr-Hesg Local Nature Reserve lies immediately to the south of the existing quarry.

The application site includes a small area of the Craig yr Hesg / Lan Wood Site of Importance for Nature Conservation (SINC) which comprises an extensive area to the south west of the application site, although the small area included within the application site does not form part of the quarry area.

A further three SINC's occur within the 2km wide search area, namely Lower Clydach Woodland SINC, Llys Nant and Craig Twyn-y-glog SINC and Taff and Rhondda Rivers SINC.

No protected or notable plants were recorded within the quarry boundary during the habitat survey.

The majority of quarry faces are in their final worked position, and either lack cracks or fissures that could be used by bats as roosts or are highly disturbed by current mineral extraction and processing operations. Surveys of the site in 2009 did not identify any roost sites. It was concluded that the presence of roosts within the active quarry (faces) was unlikely due to the high levels of ongoing mineral extraction at the site. A further bat survey was carried out in 2015 in relation to a face requiring removal. No evidence of roosting was recorded at the time.

The operational quarry itself offers negligible foraging opportunities for bats, due to the absence of vegetated habitats. The woodland and woodland edge habitats to the north of the quarry void all offer highly suitable bat foraging and commuting habitat but these will all remain undisturbed by quarrying operations.

The quarry does not contain habitats that are potentially suitable for badgers, otters or water vole.

The operational quarry provides limited opportunities for invertebrates, due to absence of vegetation or flowering plants.

No suitable aquatic habitats for great crested newt occur within the site, and none were identified in the immediate surrounding area.

Surveys have confirmed the presence of adder, slow worm, grass snake and common lizard in peripheral habitats, which may be subject to disturbance during final restoration but not during extraction activities.

A breeding bird survey has recorded the presence of 34 species of which 28 were confirmed or likely breeders. This included the presence of peregrine falcon within the quarry void, although the majority of the bird interest was found to be associated with peripheral woodland and scrub habitats of the existing Quarry which will remain undisturbed by quarrying activities.

2.4 Geology

Craig-yr-Hesg quarry is located in the south of the South Wales Coalfield, close to the axis of the syncline that forms the predominant geological structure of the region.

The regional solid geology comprises predominantly Upper Carboniferous rocks, with the Upper Pennant Series present in the vicinity of Craig yr Hesg.

The Upper Pennant Measures typically comprise bluish grey, weathered, brown, thick massive or cross-bedded fine to coarse grained (locally pebbly) sandstones.

In the area of Craig-yr-Hesg the Hughes Beds (180–270 m thick), Brithdir Beds (110-270 m thick) and the Rhondda Beds (160-335 m thick) of the Upper Pennant Measures are present and consist predominantly of conglomerates, medium to coarse grained sandstone and local finer grained units of fluvial origin.

2.5 Hydrology and Hydrogeology

The River Taf forms the major surface water drainage feature in the vicinity of the Quarry, flowing from north to south approximately 350 m to the east. The stage of the River Taf ranges from 80 m AOD in the vicinity of Abercynon to 49 m AOD in Pontypridd. The Afon Cynon joins the River Taf at Abercynon, approximately 3 km north (upstream) of the Quarry. Downstream of the site, the River Taf continues to flow south, joined by the River Rhondda approximately 1.6 km south of the site, through the suburbs and inner city of Cardiff, to discharge to Cardiff Bay.

The Nant Clydach flows from west to east approximately 850 m to the north of the Quarry, at an elevation of between 80-90 mAOD. The Nant Clydach joins the River Taf 850 m north of the Quarry, east of Coed-y-Cwm. The river is largely sourced from compensation release from Clydach reservoir located 6.6 km north-west of the Quarry and is augmented by numerous spring fed springs originating on both eastern and western valley slopes upstream of the confluence with the River Taf.

Numerous smaller water features are present in the vicinity of the Quarry. These originate from spring flows on the mid slope areas. Stream flows are ephemeral, with lengths of dry channel, sinking and re-emergence behaviour identified in the upper reaches.

The Pennant (Upper Coal) Measures are designated by the Environment Agency as a Secondary A aquifer.

Groundwater levels in the Pennant Measures within the quarry are monitored via an observation borehole which confirms that the elevation of the regional water table is lower than the permitted base of the excavation (100 m AOD) with maximum water levels of 96.77 m AOD being observed.

2.6 Access and Traffic

Historically, the Quarry used two access points to the B4273 Ynysybwl Road / Berw Road, in locations approximately 440m apart. The B4273 is subject to a 40 mph speed limit in the vicinity of the site and has street lighting with a pedestrian footway along its western side.

The southern connection formed the main site access for all vehicles and also the egress for light vehicles. The northern connection served as the egress for HGV traffic leaving the site.

However, planning permission (13/1039/10) was issued on 14 March 2014 to improve the southern access to provide for two-way HGV traffic (Access Permission). The access improvements have been completed and all traffic now uses the southern access, which is subject to a 10 mph speed limit, although the northern access remains in place for emergency use only.

The bellmouth of the access extends approximately 29m between its tangent points with the western edge of the B4273, which is approximately 6.8m wide at the access point. The access itself is controlled by Give Way markings and associated signage.

Visibility at the access exceeds the 2.4m x 120m distances in both directions specified at condition 12 of the Access Permission.

There have been no changes to design guidance which would result in the existing site access now being unacceptable since it was approved and constructed.

Almost all HGVs travelling to/from the Quarry do so via the B4273 to the south of the site, where they continue to Pontypridd before heading east to join the A470 at its grade-separated roundabout interchange, at which point they distribute primarily towards the south, where the larger conurbations in South Wales and M4 Motorway may be accessed.

2.7 Cultural Heritage

There are no World Heritage Sites or sites included on the Tentative List of Future Nominations for World Heritage Sites issued by the Secretary of State for Culture, Media and Sport situated within the site or its environs.

There are no Scheduled Ancient Monuments, Registered Parks or Gardens, Registered Battlefields or Landscapes of Outstanding and Special Historic Interest within the site or within 500 m of the site boundary.

There are no Listed Buildings within 500m of the site boundary, but there are a small number of Listed Buildings within the wider environs of the site.

There are no heritage assets recorded within the site. Within the surroundings of the site, evidence for pre-modern activity is limited and includes a chance find of a Neolithic axe head. The reviewed historic cartographic evidence has also indicated that modern industrial and transport activity, recorded within the study area and in the wider environs of the site, did not extend into the site.

2.8 ES Baseline

The above summary of baseline conditions represents a brief overview of the much more detailed consideration of current circumstances set out in the environmental impact assessment chapters.

However, this Chapter 2.0 provides a brief outline of current circumstances as a context for the description of the quarry development and restoration scheme which is described in the following chapters 3.0 and 4.0.

3.0 THE PROPOSED DEVELOPMENT

3.1 Introduction

The EIA Regulations require that ESs should include a description of the development, which then provides a context for the assessment of the aspects of the environment likely to be significantly affected by the development, and the measures available to prevent, reduce and where possible offset any significant effects on the environment (ref Schedule 4 to the EIA Regulations).

This chapter therefore provides a description of the development as an introduction to the environmental impact assessment chapters which follow as Chapters 6.0 – 14.0. However, as emphasised in the introduction chapter, no changes are proposed to the currently approved ROMP Review scheme of working in terms of the general sequence of working and the final quarry layout upon completion of quarrying.

The plans accompanying the ROMP application ES illustrated the site as existing in 2010, a series of quarry phasing plans showing the anticipated progress of quarrying at 2010, 2014, 2016, and a final extent of quarrying upon completion of extraction of the permitted reserves.

With the passage of time, the plans accompanying the current Section 73 application represent an update within this approved context to illustrate:

- the site as existing at the end of 2020;
- a final quarry layout which is consistent with the approved quarry layout; and
- an intermediate development plan illustrating the quarry layout at a general mid-way point between the current 2020 circumstances and the final quarry layout.

The submitted plans thus update rather than revise the quarry development scheme.

It is also the case that the Quarry has reached its full permitted lateral and depth limits, and no new areas of quarrying would be involved with a continuation of the approved scheme. The remaining development would be confined to working back the faces and benches at the medium and lower levels of the quarry to the defined final positions, with then the implementation of the approved restoration scheme.

3.2 Existing Quarry

The quarry is illustrated on an aerial photograph produced as plan ref CYH3 (**Figure 3.2**) with the application site superimposed, which shows the quarry as at March 2020, with no substantive changes apparent between March and December 2020 as shown on the respective plans.

The current circumstances at the quarry are illustrated on plan ref CYH4, produced at a smaller scale at the end of this chapter as **Figure 3.3.** The plan is based upon a topographic survey of the site as at December 2020.

The key features within the existing quarry are the development of the faces and benches in the north western area of the quarry, with faces generally at levels of 140m 150 /155m, 165 / 170m and 180 / 185m AOD, and a quarry base level in the north west at circa 135m AOD.

A system of internal haul roads run from the quarry area to the primary crushing plant located at the northern end of the plant site with a feed hopper at the 140m AOD level.

A separate access has been created from the eastern side of the plant site into a dust / quarry fines stockpile area.

A quarry sump is present in the south eastern area of the quarry as part of the surface water drainage arrangements.

Quarrying has been completed on the upper quarry face (185 AOD) along the northern side of the quarry, and future quarrying in that area will be associated with working the middle and lower benches back to their final positions.

Quarrying will also progress to the final position along the western boundary of the quarry, together with and deepening and broadening the floor of the quarry within the defined footprint to the approved maximum 100m AOD level..

3.3 Approved Quarry Development Scheme

The approved quarry development scheme shown on plan ref numbers SR04 and SR05 are produced for ease of reference at the end of this chapter as **Figures 3.5 and 3.6**). Plan ref SR04 (**Figure 3.5**) illustrates the anticipated progress of extraction at the end of 2016, with the direction of working beyond that date. The current circumstances shown on **Figure 3.2** are consistent with this anticipated progress, with the narrow cutting west of the plant site established, and the quarry faces and benches progressing generally westwards within the main quarry area.

The 'Intermediate' quarry development plan which accompanies the current application (ref CYH 5, produced as **Figure 3.3** at the end of this chapter), continues the approved quarry development scheme, where the key features shown are:

- The further establishment of the narrow cutting along the eastern side of the quarry, which would be developed down to the final base level of 100m AOD;
- The establishment / relocation of the dust / fine aggregate tip in the southern area of the quarry;
- The development of the quarry faces and benches westwards with intermediate benches shown at the 165m, 150m, 140m, and 130m AOD levels, and a sinking down to 115m and the final base level of 100m AOD (with a sinking below 100m AOD which would act as a quarry sump for surface water drainage).
- At this stage, quarrying would be completed above the 150m AOD level, with future quarrying associated with working the lower benches back to their final positions below this level.

The Final Quarry Development Plan is shown on plan ref CYH6 (produced as **Figure 3.4**). This is consistent with the approved final quarry layout shown on plan ref SR 05 (**Figure 3.6**), subject to some very minor inconsequential changes to face positions. The plan shows the faces and benches worked back to their final positions, creating a wider floor at the 100m AOD level. The stockpile of dust / fine aggregate is shown on plan CYH6 as being removed, albeit with some uncertainty as to the volume of that material which will be capable of being marketed over the remaining life of the quarry.

The approved quarry development plan SRO5 (**Figure 3.6**) illustrates a retained stockpile of dust in the southern area of the worked-out quarry, reflecting the same uncertainty as to the marketability of this material, and this issue will be reviewed as the development proceeds. Either way, a proportion of this material will be used in profiling the base of the quarry at the 100m AOD level as part of the restoration scheme, and to provide a gradient for long term surface water drainage.

3.4 Processing Plant

The proposed Section 73-time extension does not propose any variation to the current processing arrangements. The stone quarried from the current working area would continue to be transported to the processing plant by dump trucks from where it is discharged into a primary crusher feed hopper located at the northern end of the plant site, at a level of 135m AOD. The primary crusher reduces the stone in size, from where it is fed by enclosed conveyor to a secondary crusher and series of screens, which produce a range of single sized aggregate. The processed stone is moved by enclosed conveyors to a series of hoppers for loading out to road going vehicles, or to product stockpiles within the plant site.

In addition to the quarry processing plant, the plant site includes an asphalt plant following the implementation of permission for a new replacement plant issued by RCT in November 2013 (ref 13/0825/23). For the avoidance of doubt, the time extension application includes the continuation of the operation of the asphalt plant for the requested extended duration, in conjunction with the aggregates processing plant.

Both plants are regulated by an Environmental Permit issued by RCT which imposes detailed requirements relating to the control and monitoring of emissions from the plants and associated activities.

The plant site also previously included a ready mixed concrete batching plant, but this was decommissioned and removed from the site in 2014.

3.5 Hours of Operation

It is proposed that operations will be undertaken in accordance with the hours of working set out in the Environment Act Review schedule of conditions (ref 08/1380/10, April 2013) summarised below:

Table 3-1 Approved hours of working

Operations	Monday to Friday	Saturday	Sunday/Public Holidays
Quarrying Operations (except in emergencies)	07:00 to 19:00	07:00 to 16:00	No working
Blasting	10:00 to 16:00	No blasting	No blasting
Drilling (above 180m AOD)	10:00 to 16:00	No drilling	No drilling
Drilling (below 180m AOD)	07:00 to 18:00	No drilling	No drilling
Soil stripping or bund creation/removal	08:00 to 17:00	08:00 to 13:00	No operations
Other than vehicles associated with manufacture of coated road stone, production of ready mix concrete or servicing etc of plant, no vehicles to enter/leave quarry except between hours:	07:00 to 19:00	07:00 to 16:00	No vehicle movements other than as specified opposite.

3.6 Output and Traffic Movements

The hours of operations described in section 3.5 above establish a working week of 5.75 days. When excluding public holidays and planned shut-downs for extended breaks (such as at Christmas), it is established that there is a total of 287.5 working days per annum.

Based on an assumption that was made for the 2015 quarry extension application of the average output of 400,000 tonnes material being transported in 20 tonne average payloads, this equates to 70 loads per full working day, which results in 140 total HGV movements per day on the local highway network. However, weighbridge data indicates the actual average payload is 24 tonnes, which gives an average of 58 loads / 116 HGV movements per day.

These movements would be distributed throughout the day, with a notional 6 loads / 12 movements per hour when taking into account the maximum permitted operating hours at the site of 07:00 – 19:00 during the week, or 7 loads / 14 movements over the typical loading period of 07.00 – 17.00 based on the 140 movements per day. This reduces to an average of 5 loads / 10

movements per hour over a 12 hour working day and 6 loads / 12 movements per hour when averaged over the 10 hour period 07:00 – 17:00 during which the majority of transport activity occurs based on 116 movements per day.

Other than occasional vehicles meeting local demand, all traffic heads to/from the south along the B4273, A4223 and A470.

These issues are considered further in the transportation chapter 12.0.

3.7 Water Management

The current water management system at the Quarry comprises:

- A drainage system for the eastern side of the quarry comprising the main haul road and processing plant area / office complex area; and
- A water management system associated with the main excavation and dust stockpile area.

Processing / office complex

Surface water from this area is dealt with via an existing system of settlement lagoons and an off-site discharge regulated by NRW by a consent issued in 2013 (Consent Number AF4029101).

Main excavation and waste tip

Seepage from perched groundwater and rainfall / runoff into the main excavation makes its way to the quarry floor, via drainage channels and flows along haul roads. Runoff from the adjacent dust stockpile area is collected in a drainage channel at the base of the tip and gravity fed to the base of the quarry at approximately 107 m AOD. The water collected at the lower floor level freely seeps into the Pennant Sandstone and migrates downwards to the underlying regional water table.

Ongoing Development

The proposed development will be a continuation of the existing programme of working the quarry benches and faces in a north-westerly direction to the limit of the current excavation footprint. The base level of the quarry will not extend below a floor level of 100 m AOD, although the extent of the void area at this level will be enlarged.

Groundwater flow into the quarry is, and will continue to be, minimal, and related to perched groundwater within the Pennant Measures. Water derived from rainfall and perched sources will thus continue to be accommodated at the base of the quarry void from where it will seep into the underlying strata and water table.

The soakage capacity of the main excavation will need to be maintained to ensure efficient operation of the quarry, and this will be catered for by the retention of the existing soakage area and the encouragement of the continued efficiency of the soak-away by installing a drainage blanket (which has already been done).

Following the cessation of operations, management of surface water run-off within the quarry void would cease. It is anticipated that the quarry void will not flood but that inflow will continue to freely seep into the floor of the quarry and migrate to the underlying regional water table, as is envisaged in the restoration proposals for the Quarry described in Chapter 4.0.

3.8 Alternatives

The EIA Regulations 2017 require that Environmental Statements should include:

> *"a description of the reasonable alternatives studied by the applicant which are relevant to the proposed development and its specific characteristics, and an indication of the main reasons for the option chosen, taking into account the significant effects of the development on the environment" (ref Regulation 17 (3) (d)."*

The requirement is re-iterated in Schedule 4 to the Regulations, which in addition to providing an indication of the main reasons for selecting the chosen option, suggest that it may also be appropriate to include "*a comparison of the environmental effects*" (ref Schedule 4 1.2.)

Whilst the requirement applies to all EIA's undertaken, the circumstances of the Section 73 application which forms the subject of this EIA and ES are that the application is confined to a request for an extension of time within which to complete the currently approved development. No changes are proposed to that development, and thus no alternatives to the approved development have been considered. Moreover, a Section 73 application cannot amend the terms and parameters of an approved development: the issue is confined to the planning conditions to which the approved development is to be subject – in this case the time limit.

It would theoretically be possible to consider an alternative quarry development scheme, and as part of the submission, to make an additional request to amend the current planning conditions which require the implementation of the currently approved scheme. However, the scheme as approved is considered to represent the most logical means by which to complete the extraction of the remaining reserves at the site, and there are no obvious alternatives other than to progress the development scheme by advancing the existing quarry faces and benches westwards to the approved limits of extraction (as per the currently approved scheme). Similarly, there is no basis for amending a restoration strategy which is already approved, and which is considered to be appropriate in terms of the proposed land uses and relationship to its adjoining landscape and land use context.

There is of course a 'do-nothing' alternative, which would mean that the planning permission for the winning and working of minerals at the site would expire in December 2022, and the operation would then cease. This would result in the sterilisation of some 2.5 million tonnes of high specification aggregate which is acknowledged to be a resource of UK importance in view of its properties which are able to meet exacting specifications in highway construction and maintenance. It would not be in keeping with the principles of sustainability to sterilise this resource.

The further consequence would be that RCT would be faced with a greater burden in meeting its obligation to provide its agreed share of regional aggregate supply, given that circa 2.5m tonnes of currently permitted reserves would have been removed from the landbank of permitted reserves by virtue of the time limit on the planning permission. Changes would also need to be made to the approved restoration scheme to reflect the fact that the final quarry configuration would not have been achieved.

A 'do nothing' alternative would also remove the socio-economic benefits which would be associated with a continuation of the operation for the requested extended time period (as discussed in Chapter 14.0 of the ES). However, it is also recognised that a do-nothing' alternative and the cessation of quarrying would see the cessation of blast vibration, and the elimination of noise, dust and traffic effects attributable to the current operation.

These issues are considered further in the technical chapters of this ES, where the key consideration is whether those effects can be sufficiently regulated and controlled to allow the quarry to continue in operation for the requested extended time period without giving rise to unacceptable effects on the environment and amenity of the locality. The starting premise is that effects can be adequately regulated as is evident from the outcome of the ROMP review and the schedule of conditions imposed, where a different outcome would have been reached if RCT had concluded that the effects could not be adequately controlled. As noted in the introduction, it is also noteworthy that the refusal of the western extension application did not cite any reasons for refusal linked to operations within the existing quarry.

The Applicant thus concludes that there are no reasonable or necessary alternatives to the currently approved working and restoration schemes, which remain the most environmentally acceptable means of developing the Quarry. The existing suite of environmental mitigation measures set out in the ROMP schedule of conditions have been reviewed and, for the reasons set out in subsequent chapters, are considered to be adequate and appropriate to regulate the operation for the requested extended time period.

The ES has thus reviewed the possible need for 'alternative' or additional control / mitigation measures, and in the context of the EIA Regulations, this

is considered to be an appropriate response to the circumstances of the Section 73 application.

Figure 3-1 Craig yr Hesg Quarry Aerial Photograph March 2020 (Plan CYH3)

Figure 3-2 Existing Situation (Plan CYH4)

Figure 3-3 Intermediate Quarry Development (Plan CYH5)

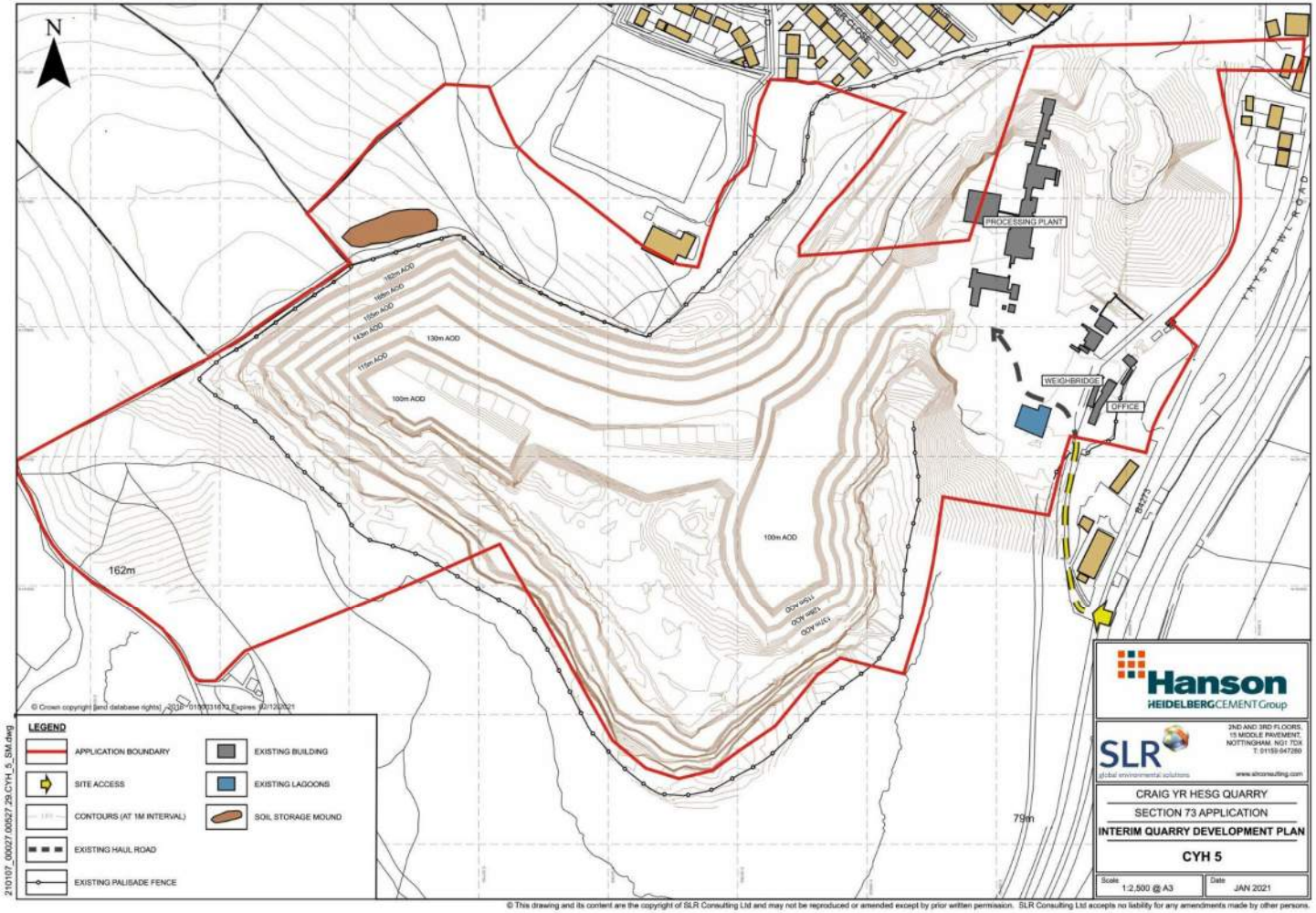


Figure 3-4 Final Quarry Layout (Plan CYH6)

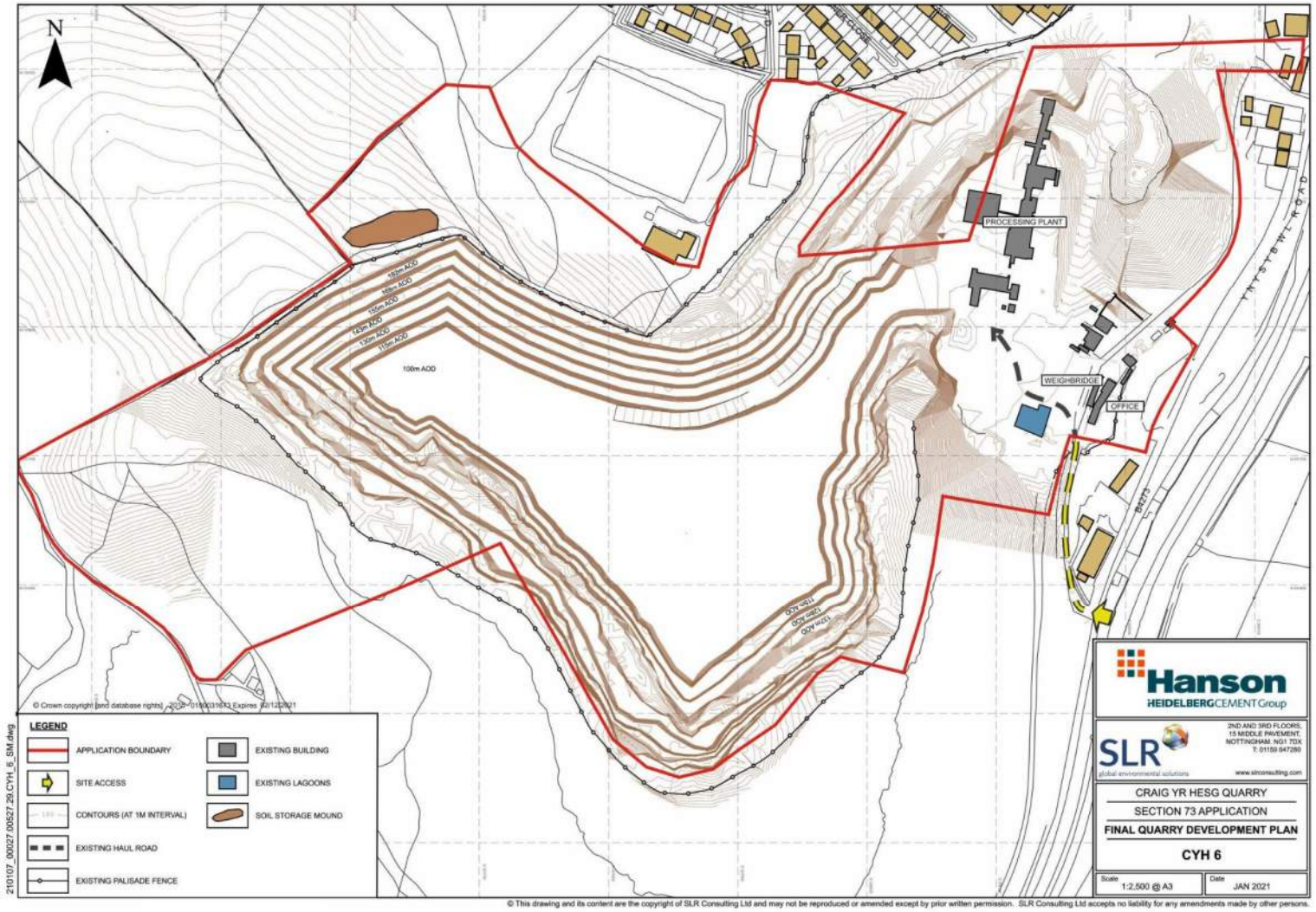


Figure 3-5 Approved Quarry Phasing Plan SR04 2016

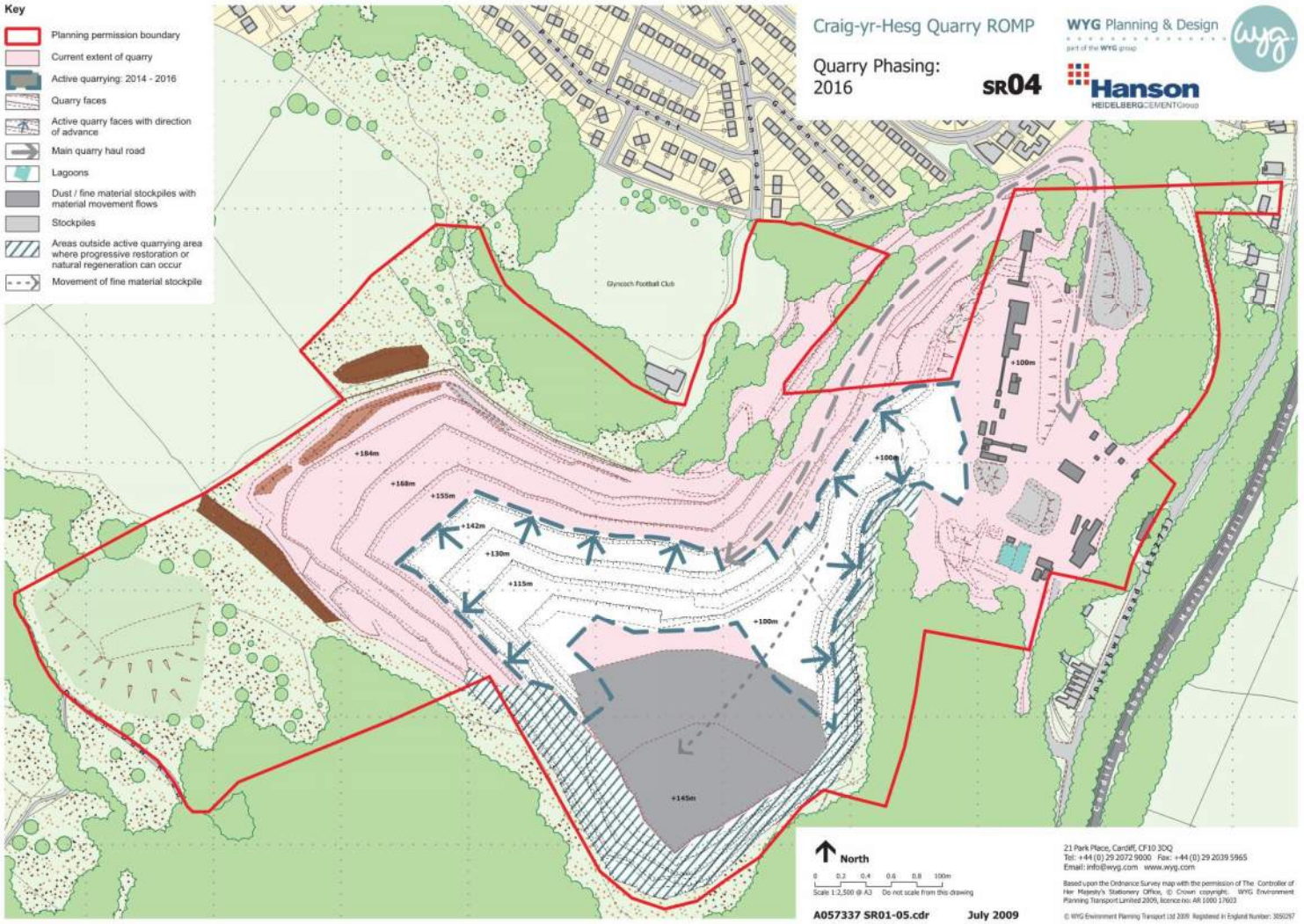
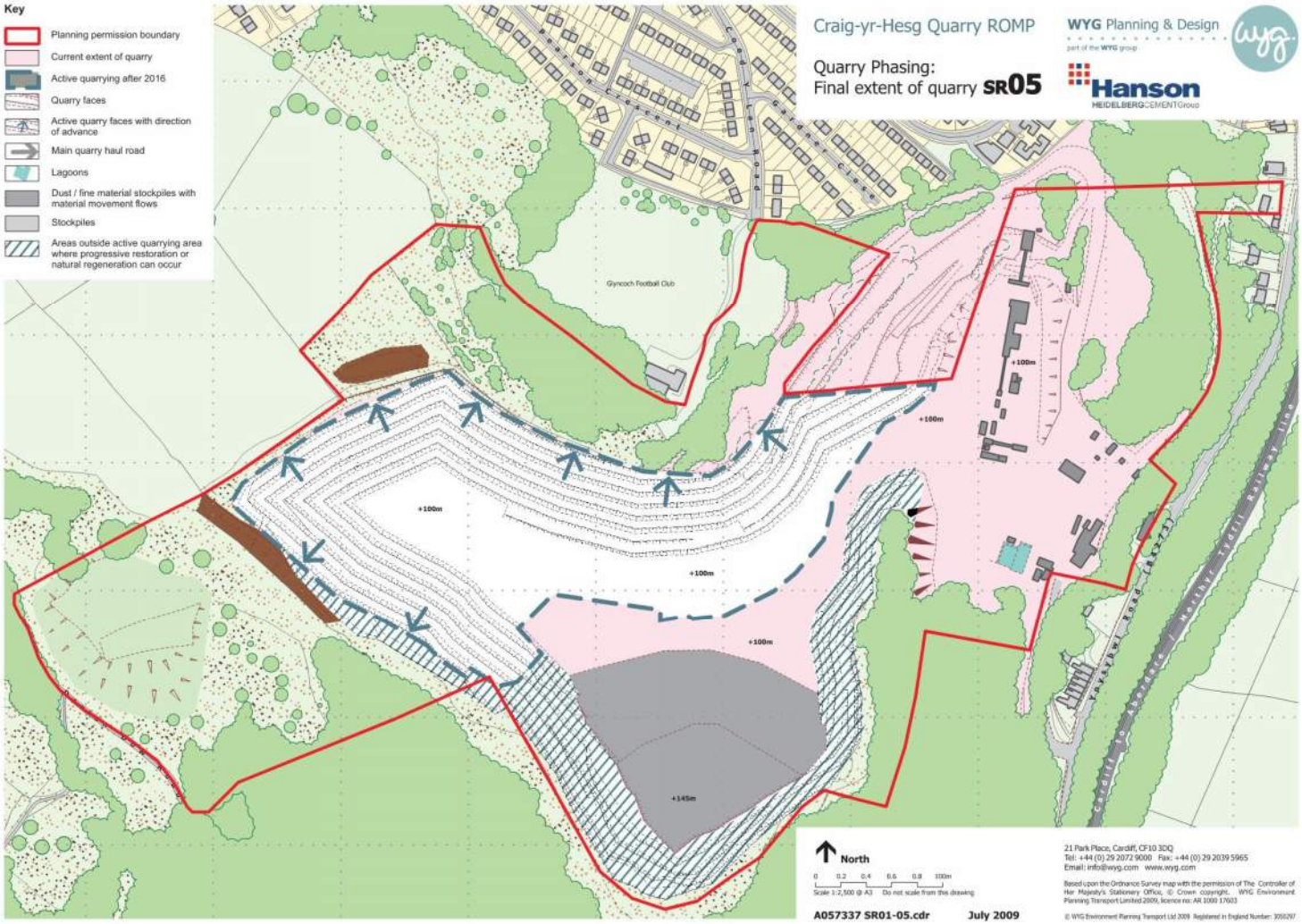


Figure 3-6 Approved Final Extent of Quarry Plan SR05



4.0 RESTORATION STRATEGY

4.1 Introduction

This strategy describes the aims and objectives for the restoration of Craig yr Hesg Quarry, the overall concept and afteruses, and proposed establishment of the restoration types, specification and management.

The restoration concept plan for Craig yr Hesg Quarry is shown on Drawing CYH 7 (reproduced below as Figure 4.1).

Cross sections are shown on plan ref CYH8, with bench treatments on CYH9, and follows the approach taken in the 2010 ROMP application (ref approved restoration strategy plan ref 'Figure 9.1' accompanying the ROMP application, reproduced below as Figure 4.2).

The restoration strategy has been based upon the anticipated physical form of the quarry upon reaching the final extent of excavation, as shown on Drawing CYH 6 (ES Figure 3.4). The opportunities for progressive restoration are constrained by the physical nature of the quarry and the order and direction of working. Limited access to existing benches along the southwest boundary of the quarry constrain the restoration approach which can be taken in that location.

The restoration concept plan has been prepared to guide the long-term restoration of the quarry, and to assist in establishing restoration principles and restoration treatments.

The details of the restoration works are likely to evolve as the quarry develops and would be subject to amendment depending on the physical nature of the quarry benches, faces and slopes created. The strategy is therefore based upon a number of quarry bench treatments or the retention of key features which would be used to create a diverse mix of habitats.

4.2 Restoration Design Principles and Objectives

The restoration strategy incorporates three main elements:

- To utilise on-site soils either for restoration planting in selected locations or to support natural regeneration in other areas. In each case the aim would be to reflect and extend the pattern of existing woodland adjacent to the site;
- To restore quarry benches and faces with a variety of treatments to enhance the ecological and landscape value of the site; and
- To restore the quarry floor using fine granular material / quarry waste and create smooth flowing contours for subsequent natural regeneration and development of species-rich grassland.

In view of the recognised ecological potential of restored mineral workings, the main objectives of the restoration proposals are ecological enhancement and nature conservation and where possible to meet local biodiversity targets (such as Action Plan for Pollinators in Wales). This is also consistent with paragraphs 134 -135 and 137 of Minerals Technical Advice Note 1: Aggregates (MTAN1). In particular, natural regeneration is proposed wherever practicable, as also encouraged by Rhondda Cynon Taf Council during previous discussions about the site. Proposals for planting are also included, where practical to supplement or assist the process of natural regeneration and give greater habitat diversity to the restoration strategy.

Overall, the aim will be to create a sheltered valley (with grassland, scrub and woodland) to extend and compliment the semi-natural broadleaved woodland habitats found locally and take account of the site's landscape setting. This includes the Craig-yr-Hesg Local Nature Reserve (LNR) immediately to the south of the site, and Craig-yr-Hesg / Lan Wood Site of Importance for Nature Conservation (SINC) to the south and west (AW 8) and the relevant descriptions of Cynon LH091 in LANDMAP.

4.3 Restoration Details

Detailed specifications and proposals for the treatment of individual quarry faces and benches will be produced as they are formed and become available for restoration.

Natural regeneration would be utilised within the quarry floor and around most of the quarry benches, with subsequent successional development of a mosaic of bare ground, grassland, trees and scrub as dictated by the substrate layer. Areas of native tree and shrub planting would also be undertaken on certain benches and slopes in the north and east of the site where safe access is available (access may be restricted due to health and safety constraints from rock fall or working at height).

The restoration of the site would be developed according to geotechnical principles and constraints. This would aim to manage loose rocks to prevent rock fall as far as possible, in the long-term, whilst adopting a rough appearance for ecological and landscape purposes within certain areas and also to prevent access to the crests of the quarry faces, through the use of barriers such as existing fences.

There is approximately 2,275m3 of soil which has been stored in a bund to the west of the site and this would be used selectively on the benches as indicated on Drawing CYH 7.

There is also quarry waste / dust that is being generated at the site and would be used to reprofile the floor and on the benches as indicated on Drawing CYH 7.

Quarry Faces: Restoration Treatments

Opportunities are likely to be available to retain attractive rock outcrops as crags, and to retain naturally occurring crevices and pockets in which different types of vegetation can locally establish. Quarry faces would generally be left to regenerate naturally, which would in part be enhanced by low scree slopes and crushed rock placed at the toe of faces, where practicable. Where deemed necessary, to create a more 'natural' and variable cliff profile, a small proportion of the faces in the south-west of the quarry may be subjected to a series of restoration blasts to form scree slope. The potential extent of these areas is shown on Drawing CYH 7. Set within existing and proposed woodland, the faces would appear similar to natural outcrops occurring within woodland along the steep valley side slopes of the Taf, for example, within Coed Craig yr Hesg to the south of the site.
Localised small scree slopes and pockets of loose rock would create different conditions with a variable and uneven surface texture creating suitable ground conditions to facilitate ecological succession, encouraging natural regeneration of a diverse range of species, as described in MTAN1, paragraph 135. The resulting variety of vegetation types would avoid uniformity of restoration treatment, increasing biodiversity, geodiversity and landscape interest.

Quarry Benches: Restoration Treatments

Restoration work would commence on benches as soon as possible after they have been worked to their final positions and are no longer required for access purposes. The quarry benches would predominantly be restored through natural regeneration. Habitat diversity would result from the variety of conditions created by the bench treatments during restoration.

Quarry benches would be restored using a combination of the following treatments, depending on the specific requirements of the area to be restored. In all cases a geotechnical rock trap profile will be established along the edge of the bench to catch rock fall from the quarry faces. This rocktrap comprises a 1.5m high bund at the front edge of the bench with a trough behind it where the restoration treatments defined below will be applied.

The selection of the most appropriate treatment is based on landscape, visual and ecological considerations. Through the use of different treatments the development of a variety of plant communities would occur. Coarse rock and fine granular material remaining from quarrying would either be retained on the benches as a substrate or form the basis of one of the alternative treatments set out below. This would provide a variable and uneven surface texture creating suitable ground condition to facilitate ecological succession.

All bench treatments will also incorporate placed material for rock trap profiles for geotechnical and health and safety reasons where access is available, and it is safe to do so.

Quarry Bench Treatment 1: Bare Rock (T1 on Drawing CYH 7)

Quarry benches around parts of the site would be left as bare rock, with any existing remaining loose material to be retained, with no further treatment, allowing vegetation to re-colonise naturally. Quarry benches in the southern part of the quarry are suited to this approach, where further access to the higher levels is not possible and the lower levels are set down and visually enclosed.

Low fertility and poor growing conditions would result in gradual colonisation through natural ecological succession. This typically promotes the growth of less common species, which often appear following re-colonisation by more common pioneer species. These faces are generally north facing, and the existing higher-level sections are already regenerating and would be suitable for colonisation of mosses, ferns, bryophytes and lichens.

Quarry Bench Treatment 2: Quarry Waste (T2 on Drawing CYH 7)

In several areas around the site, the bench surface behind the rock trap bund would be covered with a layer of granular material and fines taken from the quarry waste stockpile. There would be no further treatment of this material once deposited, allowing vegetation to re-colonise naturally. The material with be deposited with a minimum depth of 150mm, including undulations in the surface. These would form hummocks and hollows, leading to more diverse growing conditions than would otherwise be the case. Particular care would be taken during the spreading of fine grain sized material to avoid trafficking as this would lead to compaction, slowing down the process of natural colonisation by shrub and tree species.

Bench treatment 2 is proposed in the north-west of the site, including the benches which are still to be formed. Parts of these faces are set down and visually enclosed. Similar to bench treatment 1, the use of quarry waste on benches would create low fertility and poor growing conditions. It would result in gradual colonisation through natural ecological succession. This typically promotes the growth of less common species, which often appear following re-colonisation by more common pioneer species.

Quarry Bench Treatment 3: Soiling - Natural Regeneration (T3 on Drawing CYH 7)

The benches in the northern-most part of the existing quarry near to the plant site, have reached their final position and are beginning to weather. Part weathered rock and loose material in this part of the site would form the substrate for soiling. Quarry waste and subsoil available on site would be spread over the surface of the benches to variable depths up to 500mm. Particular care would be taken during the spreading of the growing medium to avoid trafficking as this would lead to compaction, slowing down the process of natural colonisation. The benches would then be left to re-vegetate naturally.

Quarry Bench Treatment 4: Soiling - Planting (northwest quarry waste stockpile / tip) (T4 on Drawing CYH 7)

Bench treatment 4 would be of particular value in visually prominent locations where more rapid re-vegetation would be beneficial. It is also important for providing a substrate suitable for more demanding species that are required to link and buffer the existing semi-natural woodland blocks. The bench would be prepared with quarry waste spread over the surface behind the rock trap bund to a depth of 250mm. This material would facilitate the drainage of the subsoil and topsoil, which would be taken from the on-site stockpiles and spread to a depth of up to 500mm (but where the actual depth will reflect the available soil volumes). Undulations in the surface of the soil would create hummocks and hollows, leading to diverse growing conditions. Particular care would be taken during the spreading of the soils to avoid trafficking as this would lead to compaction, limiting the establishment of planting.

The soiling of the benches would aim to create low-nutrient levels, suitable for establishing native shrub and tree planting, and for natural colonisation, whilst being less attractive to broadleaved weed species. A proportion of the area shown would be planted leaving other areas to infill with natural regeneration.

Planting would be undertaken in selected locations where the long-term approach of natural colonisation may not be suitable. There is limited space available for machine access to rip these areas prior to planting, therefore the material will be loose placed by excavator and any large stones removed during this process. There will be no other cultivation.

4.4 Quarry Floor

On completion of quarrying the processing plant, offices, ancillary buildings and hard standings would be removed unless otherwise agreed in writing with the local planning authority (ref ROMP condition 3). A maintenance access route would be retained from the entrance in the south and leading to the central areas of the site.

The area would be re-profiled to smooth flowing contours of a suitable gradient using quarry fines and soils available from the soil stockpile. Similarly, the quarry floor within the quarry void would also be graded to smooth flowing contours using quarry fines and soils. A consistent fall across the quarry floor will aid site drainage however some undulations and depressions would be retained and enhanced to provide seasonal pools and wetland areas.

Given that the quarry floor is set down and hidden from view, it has been previously agreed (as part of the 2010 ROMP) that restoration techniques can utilise natural processes and the dispersal of seed from the existing habitats surrounding the site.

The aim of the restoration strategy would be to establish species-rich grassland across the quarry floor, with a rich mosaic of bare ground and sparsely vegetated areas anticipated due to the conditions. Local areas of more compacted ground may also offer slower drainage and wetness variation / seasonal ponding.

Most of the limited quantities of soils available within the site would be used for the restoration of the quarry benches, however any remaining soils would be mixed with the graded quarry waste to improve and further vary the substrate conditions.

The 2010 ROMP application also described how potentially an imported source of organic matter could be mixed into the restoration surface. The aim being to support the establishment of a suitable grass mix and sward that would stabilise the surface to prevent erosion and gullying. It was anticipated that following the initial stabilisation of the surface, the grass cover would decline due to the progressive reduction in the nutrient content of the growing medium. Natural colonisation would then occur, and species diversity would increase during subsequent years as the fertility of the growing medium declines.

The availability of a potential source of suitable organic matter would need to be assessed towards the later stages of the development and in preparation for the restoration works. In addition, it is proposed that areas of grass seeding direct onto the quarry waste surface are also trialled to determine whether organic matter is required.

Seeding Techniques

Seeding of the initial nurse crop would typically involve the following tasks:

- Assess need to apply herbicide in advance to remove any weeds prior to sowing;
- Carry out cultivations and stone pick to form a fine tilth;
- Sowing rate to be agreed with supplier;
- Sow when growing conditions are good and sufficiently warm and moist (not too early in the Spring before the soil is warm or late in Autumn); and
- Once sown, roll immediately to ensure good soil-to-seed contact.

Management of Grassland

Management of the species-rich grassland would then also typically include the following:

- Mow all plant growth (sown grasses and weeds) regularly to 40-60mm throughout the first growing season to prevent weeds smothering the slower-growing grasses;
- The sowing can be managed as a meadow allowing the grasses to grow tall, flower and seed from May through to July/August. The grass meadow should be cut back and mowing resumed in late summer; and
- Requirements for artificial fertiliser to be reviewed, although assumed not necessarily required to encourage floristic diversity.

4.5 Planting proposals

Planting would be undertaken along selected sections of the quarry benches to the north-west of the site as described above, and shown on the quarry restoration plan, Drawing CYH 7 and also with some enrichment planting west of the rugby club.

Although the 2010 ROMP application originally proposed additional planting to be carried out along the south-western boundary of the quarry, following subsequent discussions with the planning authority, it is now proposed that this area would be left for natural regeneration. This is due to the proximity to the existing woodland at Coed Craig-yr-Hesg and the aim of allowing the existing genetic parent material to spread naturally.

All planting would be of native species, specified in accordance with the HTA National Plant Specification: 1997. In order to ensure that all new planting is compatible with the local gene pool of the area, all woody plant species would be of local Forestry Commission provenance zone 303 as outlined in Forest Practice Note No. 8, entitled 'Using Local Seed Sources for Planting Native Trees and Shrubs', produced by the Forestry Commission (1999).

In order to provide feeding opportunities for birds outside of the breeding season, planting would incorporate berry and seed-bearing tree and shrub species, for example, Hawthorn, Blackthorn and Common Alder. Other suitable species that occur in abundance locally, for example Elder and Bramble would colonise the planting.

The proposed planting mixture is set out in the table below, reflecting the species composition of existing woodland and hedgerows in the area and in accordance with 2009 ROMP.

Table 4-1 Proposed Planting Species Mix

Hedgerow Species Mix:	Bare Root BR ContainerGrown CG	Height Cm	%
Alnus glutinosa (Alder)	BR	40-60	5
Betula pendula (Birch)	BR	40-60	10
Cornus sanguinea (Dogwood)	BR	40-60	5
Corylus avellana (Hazel)	BR	40-60	15
Crataegus monogyna (Hawthorn)	BR	40-60	20
Fraxinus excelsior (Ash)	BR	40-60	15
Ilex aquifolium (Holly)	C	40-60	5
Prunus spinosa (Blackthorn)	BR	40-60	5
Quercus petraea (Oak)	BR	40-60	20

Whilst Ash is included in the species mix, the guidance relating to imports or movement associated with Chalara Ash die-back will need to be reviewed at the time of implementation. In the event that a suitable source of Ash trees are not available this species will be substituted with Oak.

Planting Techniques

All plant handling and planting operations would comply with relevant clauses of CPSE 'Handling and Establishing of Landscape Plants' (obtainable from the Horticultural Trades Association).

Planting of new trees, shrubs and woodland blocks would be carried out as follows:

- Planting to be carried out during suitable conditions, typically between Mid-October to April;
- To be planted at 2m centres in single species groups of 3-5 plants, with shrub species will be concentrated to the edges of the planting blocks;

- Precise extent of planting block to be based on assessment of safe standoffs to rock faces on an area-by-area basis. Unplanted areas for natural regeneration would provide opportunity for further diversity along the benches;
- Stock will be supplied as 40-60cm 1+1 transplants;
- All plants will be planted using notch- or pit planting techniques. Soil amelioration is not proposed within areas to be planted; and
- All plants will be protected from grazing, by biodegradable individual spiral guard.

Management of Planting

Typical management of planting areas would be as follows:

- Following the 1st growing season, a 'beating up' inspection will take place and replacement of dead / diseased or dying plant stock, to ensure an 85% overall stocking density by year 5;
- Herbicide application to 1m diameter around the bases of the trees and shrubs will be required to reduce competing vegetation (typically 1 visit at beginning of the growing season);
- Inter-row strimming as necessary to reduce competing vegetation (typically 1 or 2 visits a year);
- Fertilisers may be used in Year 1 or 2 to aid establishment;
- Tree/shrub ties, stakes and rabbit-guards will be checked, adjusted or replaced; and
- In year 5, and if plants have grown to a suitable level, selective thinning of the planting block and coppicing of hazel may be carried out to encourage structural diversity. All protective tree / shrub guards to be removed during the winter of Year 5 unless agreed otherwise.

Although management of the new blocks would ideally follow the tasks described above, it may be that less maintenance can be safely carried out on certain parts of the site, than would otherwise be undertaken at more accessible within the main quarry floor. Specific tasks would therefore be based on assessment of safe standoffs to rock faces on an area-by-area basis.

4.6 Fencing

All planting areas are located away from existing grazing by livestock, being along quarry benches. Any potential livestock grazing would only occur on the quarry floor. Whether or not livestock fencing is required would depend on the future potential of the habitats created to support light grazing. The need for fencing would be reviewed if grazing is proposed.

If fencing is provided it would be stock-proof, with stiles and gates to allow for maintenance access.

4.7 Coordination, monitoring and aftercare

It is anticipated that the timing and location of restoration works would to a certain extent be flexible. All restoration work would be governed by detailed specifications, which would detail the locations selected for each restoration treatment.
It is recommended that any progressive restoration undertaken is monitored throughout the quarry phases to identify any further management and/or improvements required. The monitoring programme would be carefully designed as the results may yield important information that can be applied in devising effective quarry restoration schemes in the future and may provide new information on colonisation/succession at hard-rock quarries.

Management of the areas would be important to the development of the ecological potential of the site. This would include an aftercare scheme setting out the objectives for the different habitat types, and guidance for the treatment of the vegetation to ensure desirable species are encouraged and undesirable species are prevented from becoming established.

Figure 4-1 Updated Restoration Strategy Plan CYH7

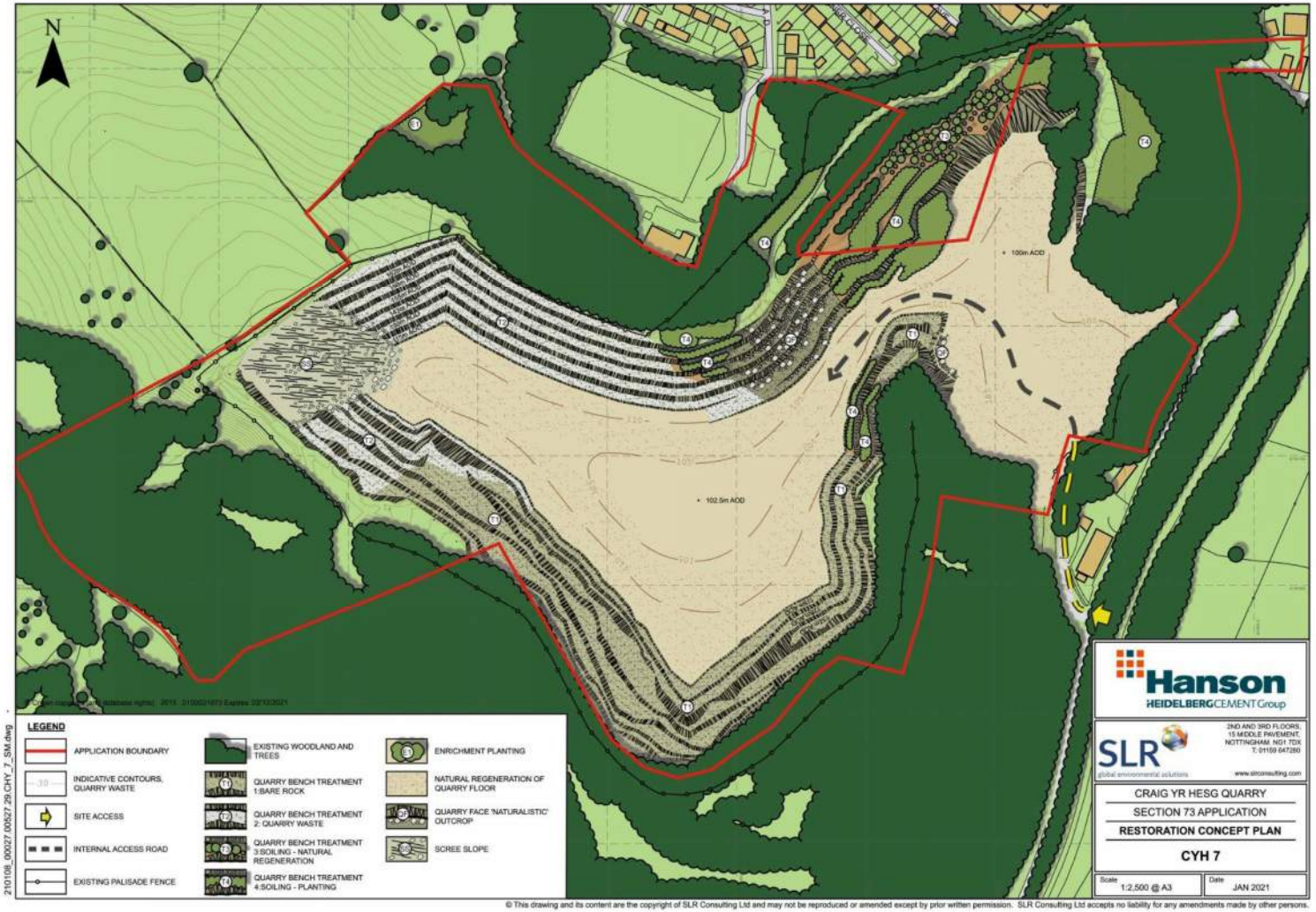
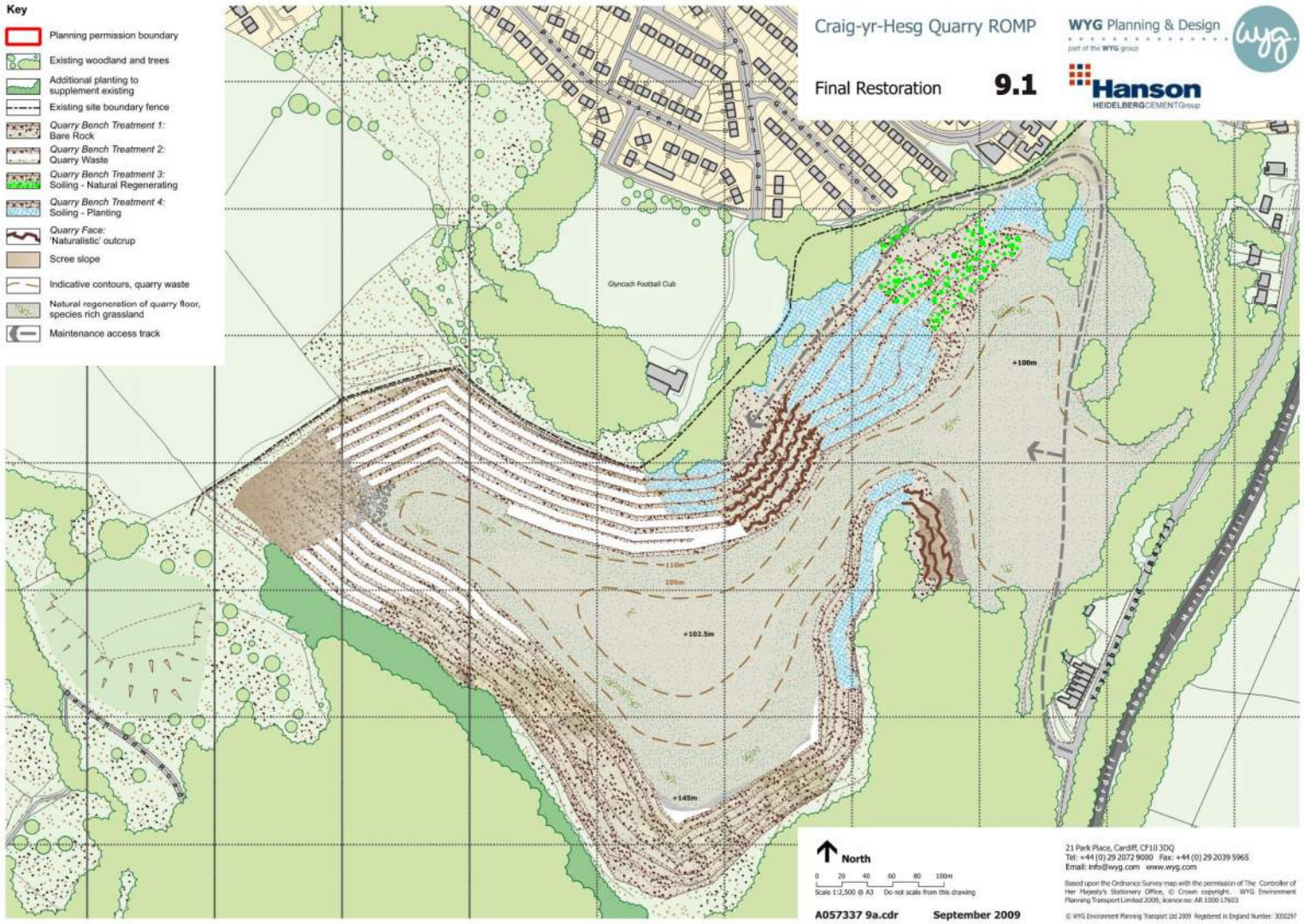


Figure 4-2 Approved Restoration Strategy ref CYHA057337/9a



5.0 ENVIRONMENTAL IMPACT ASSESSMENT

5.1 Introduction

The consideration of the potential environmental effects of a continuation of the current development for the requested additional time period has been informed by:

(i) the formal scoping opinions issued by RCT Council prior to undertaking the 2010 ROMP EIA and 2015 western extension EIA;

(ii) the issues which were raised during the processing of the two applications;

(iii) the Applicants' experience of environmental and amenity issues associated with the operations at the existing Quarry; and

(iv) based upon the above, the Applicant's view as to the key issues which require consideration, as highlighted in section 1.5 of this ES.

It has not been deemed necessary to seek a formal EIA scoping opinion from RCT regarding the issues which should be addressed as part of the current EIA. These issues are well established from the previous EIA's and the consideration of the respective applications.

This is re-enforced by the fact that other than timescale, the Section 73 application does not seek to change any elements of the currently approved quarry development and restoration scheme, which itself has been the subject of an EIA (ROMP application) and which is subject to a comprehensive schedule of controls / planning conditions which were informed by that EIA.

The EIA has thus focused on the key topics which are considered to be relevant to the requested time extension, notably landscape and visual effects, noise, blast vibration, dust / air quality, and traffic where the consequence of the time extension would be that these effects would be experienced for a slightly longer period.

The EIA has included the commissioning of an updated ecological study to supplement ecological surveys and assessments previously undertaken. Updated studies have also been carried out with respect to landscape, traffic, and noise, including undertaking updated noise and traffic surveys, with the Air Quality study benefitting from recent PM10 monitoring reports.

For completeness, the EIA and this ES also gives brief consideration to hydrology / hydrogeology and cultural heritage, but in the context that there would be no changes affecting these topics arising from the time extension.

Again, for completeness, the ES includes consideration of socio-economic, well-being and health issues, consistent with the approach undertaken in support of the western extension application.

Via the ROMP Review, the quarry is currently regulated by a comprehensive schedule of 49 conditions which impose detailed controls on the full suite of environmental and amenity issues associated with the approved quarry development scheme. In determining the ROMP application, RCT were satisfied that these conditions provided an adequate level of control over the operation to safeguard the environment and amenities of the locality within the time period of the development to December 2022. In this context, a key function of the current EIA is to establish whether the existing environmental and amenity controls remain appropriate for the extended duration of the operation, or whether additional or amended controls are required.

5.2 Methodology

The EIA has included the commissioning of specialist consultants to assess the landscape / visual, ecological, noise, dust/ air quality and traffic effects of the requested time extension, with the results set out in individual chapters in this ES. In general terms, each chapter sets out the methodology adopted in the assessment, to include, where appropriate:

- Desk based data collection, site survey, etc
- Guidance to be adopted [*GLVIA, BS4142 etc*];
- Sources of information;

- Relevant Planning Policy or Strategy referred to;
- How "*significance*" is defined;
- The 'characteristics' of the impacts;
- The 'sensitivity' of receptors;
- The 'nature' of the effects (e.g. direct/indirect, temporary (reversible) / permanent (irreversible).
- Any interaction with other topics; and
- Any technical difficulties associated with the assessments.

5.3 Assessment Structure

There are differences of approach in undertaking the respective assessments, which for certain topics are prescribed in detail by external guidance, but where others follow less prescriptive approaches.

The Chapters do however follow a generally common approach with, where appropriate, sections which deal with:

- **Baseline conditions**; reflecting current and future circumstances at the quarry.
- **Key Receptors**; namely the receptors in the vicinity of the quarry which are affected by the ongoing development.
- **Summary of development,** highlighting those issues of relevance to the technical topic;
- **Design Mitigation,** highlighting the 'built-in' or 'designed-in' mitigation measures, with cross references to existing planning conditions/ controls.
- **Assessment,** relevant to the technical chapter and following specific technical guidance, but with a description of the sensitivity of receptors, character of impact, and significance.
- **Mitigation measures,** which are identified as a means of addressing identified negative impacts, again drawing on controls imposed via existing planning conditions and other regulatory regimes.
- **Residual impacts,** after taking into account built in and additional mitigation measures.
- **Summary of effects.**
- **Recommendations,** and
- **Conclusions.**

5.4 EIA and ES

In undertaking the EIA and preparing the ES, it has been recognised that there is no statutory provision as to the form of the ES, but it must contain the information specified in Regulation 17 of the EIA Regulations 2017, and any additional information specified in Schedule 4 of the Regulations relevant to the specific characteristics of the particular development or type of development and to the environmental features likely to be significantly affected.

The ES may consist of one or more documents, but it must constitute a 'single and accessible compilation of the relevant information' (ref Berkeley v SSETR, 2000). The ES has been prepared to ensure compliance with these requirements, with Volume 1 (this document) intended to be read as a single document, with cross references to technical appendices and data (ES Volume 2).

Whilst only applicable in England, it is also useful to note the advice set out in the Planning Practice Guidance to the National Planning Policy Framework (NPPF) which provides further commentary on the information to be included within an ES. It notes that whilst every ES should provide a full factual description of the development, the emphasis of Schedule 4 is on the "*main*" or "***significant***" effects to which a development is likely to give rise. It confirms that an ES "should be proportionate and not be any longer than is necessary to assess properly those effects. Where, for example, only one environmental factor is likely to be significantly affected, the assessment should focus on that issue only. Impacts which have little or no significance for the particular development in question will need only very brief treatment to indicate that their possible relevance has been considered" (ref Planning Practice Guidance ID4-035-20170728: Revision date 28 07 2017).

The potential environmental and amenity effects are considered in turn, in this context, with attention to those topics deemed to have the potential to give rise to the 'main' or 'significant effects' and with brief treatment of other topics to show that their possible relevance has been considered.

An overall summary of the environmental effects is set out in Chapter 15.0 which draws upon the main environmental issues set out in preceding chapters, and which provides a link between the conclusions and recommendation of the topic studies, and the overall conclusions of the ES.

Further context is provided by the consideration of planning policy which highlights, inter alia, the environmental issues which need to be addressed to satisfy planning policy requirements and advice.

6.0 LANDSCAPE & VISUAL IMPACT

6.1 Introduction

This chapter provides a summary appraisal of the potential landscape and visual effects of the proposed Section 73-time extension application at Craig yr Hesg Quarry.

The quarry currently has a time limit planning condition requiring the winning and working of minerals or the depositing of mineral waste to cease by 31st December 2022, and the application seeks to extend that end date by 6 years to 31st December 2028.

If the application is granted the conditions will include requirements inter alia, that:

- no later than 12 months following expiry of the planning consent, or the earlier permanent cessation of winning and working of minerals, to dismantle and remove all plant, machinery, hard standings, ancillary workshops, buildings or structures (unless otherwise agreed in writing with the LPA,), and the sale and transportation of any residual stocks shall cease;
- the working of the site to be carried out in accordance with the updated quarry phasing plans, drawing numbers CYH5 and CYH6 (ES Figures 3.3 and 3.4) which, with minor updates, reflect the currently approved working scheme shown on plan ref numbers SR04 and SR05 (ES Figures 3.5 and 3.6); and
- detailed final restoration to be in accordance with the updated restoration concept plan ref CYH7 (ES Figure 4.1) which, with minor updates, reflect the currently approved restoration concept plan ref CYHA057337/9a (ES Figure 4.2).

The existing ROMP planning conditions were informed by an EIA undertaken in support of the ROMP application (08/1380/10) and set out in an Environmental Statement (ES) dated July 2010. Where appropriate, the landscape and visual assessment section of the 2010 ES has been referenced in this updated appraisal of the proposed time extension (hereafter referred to as “2010 ES”).

The main landscape and visual elements of the proposed development include continued mineral extraction within the existing quarry void / footprint of disturbance in accordance with the currently approved limits but over an extended period of time, followed by progressive and then final restoration of the site in accordance with the currently approved schemes. The site’s infrastructure, access, plant and buildings associated with mineral processing, distribution and management would all continue during operational phases as existing, but over the requested extended period of time, after which time they would be removed (unless otherwise agreed with the LPA) and the areas restored in accordance with a detailed restoration scheme based upon the restoration concept plan ref CYH7 accompanying the application.

These aforementioned elements conform closely with the currently approved working and restoration scheme, and the potential of the scheme to affect landscape character, elements and features within the site itself and also the character and visual amenity of offsite receptors in the immediate surrounding area was assessed as part of the 2010 ES. The purpose of this current appraisal is to check and update the findings of the 2010 ES and consider the effects on landscape character and visual amenity which would arise from a continuation of the mineral extraction operation for an extended time period, with an associated delay in the implementation of the restoration strategy.

6.2 Methodology

This appraisal has been undertaken in accordance with the principles produced by The Landscape Institute and Institute of Environmental Management and Assessment’s Guidelines for Landscape and Visual Impact Assessment, third edition (GLVIA3). A full impact assessment is not deemed to be required due to the condition of the existing site and the nature of the ongoing works proposed (extension of time).

In relation to duration of effects, GLVIA3 describes how short term might be zero to five years and medium term might be five to ten years, whilst also recognising that there is no fixed rule on these definitions. In view of this, the

proposal to extend the timescale of the development at the Quarry by six years can be regarded as short to medium term. However, the progressive nature of the development means that certain effects would be much more limited in duration, such as the working of individual benches or within certain parts of the site. The final restoration of the site would then be permanent.

A desk-top review has been undertaken of the 2010 ES; the relevant designations and published landscape character assessments have been researched; and aerial photography and topographical surveys have been reviewed within a 3km study area.

Fieldwork was then undertaken in January 2021 to the site and surrounding areas, including taking updated photographs from several representative public viewpoints which were used in the 2010 ES.

Paragraph 5.1 of the GLVIA3 describes how landscape effects are concerned with "*how the proposal will affect the elements that make up the landscape, the aesthetic and perceptual aspects of the landscape and its distinctive character*".

Paragraph 6.1 of the GLVIA3 describes how visual effects are concerned with "*assessing how the surroundings of individuals or groups of people may be specifically affected by changes in the content and character of views as a result of the change or loss of existing elements of the landscape and/or introduction of new elements*".

The summary appraisal thus deals separately with each of these effects, although where relevant and appropriate, cross references are made to the same features or elements where they are relevant to both topics. The working and restoration scheme enjoys the benefit of planning permission, and no changes are proposed to this approved scheme. The 2010 ES concluded that the landscape and visual effects associated with the development scheme would be generally negligible / slight adverse during the quarrying operations, reducing to slight beneficial at the restoration stage. The key issue for this Appraisal is thus to consider whether these previously assessed effects remain applicable, and whether it would be acceptable for the identified effects to continue for a longer time period.

6.3 Policy Context

Planning Policy Wales (PPW) (Edition 11) sets out the land use planning policy guidance in relation to mineral extraction and related development in Wales. One of the key principles set out under paragraph 5.14.2, relevant to this landscape and visual appraisal is to:

- *"protect environmental and cultural characteristic of places, including those highly cherished for their intrinsic qualities, such as wildlife, landscapes, ancient woodlands and historic features, and to protect human health and safety and general well-being".*

In relation to landscape, PPW confirms that "Landscape is an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors. Landscape policy is guided by the European Landscape Convention". Under paragraph 6.3.3 it is described how:

- *"All the landscapes of Wales are valued for their intrinsic contribution to a sense of place, and local authorities should protect and enhance their special characteristics, whilst paying due regard to the social, economic, environmental and cultural benefits they provide, and to their role in creating valued places".*

In relation to local landscapes, PPW confirms that planning authorities may include policies for landscape features, characteristics and qualities of local significance, and the designation of Special Landscape Areas (SLAs):

- *"SLAs are non-statutory designations that define local areas of high landscape importance, which may be unique, exceptional or distinctive to the area."*

On the 2nd March 2011, RCT resolved to adopt the 'Rhondda Cynon Taf County Borough Local Development Plan' (LDP), which covers the period from 2006 – 2021. The LDP interactive proposals map shows the site covered by Policy AW 14 – safeguarding of minerals (where "*mineral resources shall be safeguarded from any development which would unnecessarily sterilise*

them of hinder their extraction"). Policy SSA25 defines land to the west of the existing Craig yr Hesg Quarry as a 'preferred area of known mineral resources'. Policy CS10 defines a quarry minerals buffer zone around the existing quarry and 'preferred area'.

The LDP interactive proposals map also shows that the land immediately to the south and west of the existing quarry is within a Special Landscape Area (SLA) with reference to LDP Policy NSA 25 and SSA 23. The quarry itself lies outside the SLA. The SLA also extends over the valley floor to the east of the site, the ridgeline to the east of Pontypridd and Abercynon, higher ground to the west and southwest of Pontypridd; and land along the valley side between Cilfynydd and Glyntaff. The policy describes how:

- *"Development within the defined Special Landscape Areas will be expected to conform to the highest standards of design, siting, layout and materials appropriate to the character of the area."*

In the Northern Strategy Area, SLAs have been identified to "*protect the distinctive upland / valley landscape of the area. Particular consideration has been given to the protection of the unspoilt valley slopes and ridges which form a visual backdrop to the settlements of the area*."

The LDP interactive proposals map also shows several landscape-related environmental designations within the study area:

- Craig-yr-Hesg Local Nature Reserve (LNR) immediately to the south of the site and Craig-yr-Hesg / Lan Wood Site of Important Nature Conservation (SINC) to the south and west (AW 8);
- Housing allocation (SSA 10) and Green Wedge (NSA 24 and SSA 22) west of the Glyncoch residential area, to the north-west of the site; and
- Cycle Network Improvement (NSA 23 and SSA 21), along part of the Taff Trail to the east of the site.

6.4 Landscape Assessment

6.4.1 Landscape Baseline

The landscape baseline in the 2010 ES described the elements and features within the site and surrounding area and which are largely unchanged. These are summarised below.

The site and study area is located within Natural Resources Wales' National Landscape Character Area "NLCA37 South Wales Valleys". The key characteristics in the published description from 31/03/2014 describes *inter alia*:

- *Extensive Upland plateaux;*
- *Numerous steep-sided valleys;*
- *Ribbon urban and industrial areas in valleys;*
- *Extensive remains of heavy industry;*
- *Contrast of urban valley activity next to quiet uplands;*
- *Large blocks of coniferous plantation and deciduous woodland fringes;*
- *Heather, rough grassland and steep bracken slopes;*
- *Improved pastures on some lower valley sides;*
- *Field boundaries;*
- *Transport routes restricted to valleys*; and
- *Iconic cultural identify.*

LANDMAP, the Welsh landscape baseline classifications indicate the following key characteristics for the site and immediately surrounding study area (and as was detailed within the 2010 ES):

- Geological Landscape *"CynonGL015: Taff Valley", "Classified as glacial mountain valley, N-S valley, glacially eroded into high-level plateau in North and South dipping Pennant sandstones (Upper Carboniferous)...Boulder clay in hollows in high ground & beneath sand/gravel in valley floor…Large working Glyncoch (Craig yr Hesg) Pennant sandstone quarry", with moderate overall evaluation;*

- Cultural Landscape *"CynonCLS013: Ynysbwl", described as "CynonCL056: Designated Landscape Areas" and the northern and east part in "CynonCL036: Pontypridd", with high overall evaluation;*

- Historic Landscape *"CynonHL352: Nant Clydach (Ynysybwl).* Most of the quarry is situated within this area which is described as *"An urban aspect area centred on the Nant and Cwm Clydach. It is defined by the extent of urban growth and industrial activity expanding in the surrounding areas...,".* The western part is within aspect area *CynonHL833: Llanwonno and Cwm Clydach,* whilst the eastern boundary is adjoined by aspect area *CynonHL977: Pontypridd and the Afon Taff;*

- Landscape Habitats *"CynonLH091".* The site is within a mosaic of dry (relatively) terrestrial habitats and area of *"Broadleaved woodland and bracken dominated ffridd slopes grading into wooded river valley and including Ynysybwl…includes ancient woodland and small marshy fields, especially at Buarth Capel..." with high overall evaluation; and*

- Visual and Sensory *"CynonVS141: Ynysybwl"* hillside and scarp slope mosaic described as *"Essentially upland in character with built development/ associated elements (pylons, telecom masts)… Open landscape of rough grazing with conifer plantations, small woodland/broadleaf clumps creating a mosaic pattern, combined with strong rhythmic undulations of minor ridge/crests and valleys provides visual movement and cohesion…" with moderate overall evaluation.*

6.4.2 Attributes of the Site and Study Area

The application site boundary covers an area of around 28.8ha and extends over the active quarry and stocking area (13.5ha), plant site area and offices (2.5ha), a soil storage bund (0.1ha), and a range of successional habitats and undisturbed land, woodland and scrub around the margins (12.7ha).

The quarry has been developed to its maximum permitted lateral footprint, and all future quarrying operations would be confined to this existing footprint, largely associated with working the middle and lower benches to their final pre-restoration positions.

The main quarry has been worked into the side of a natural hill, as a series of roughly parallel benches (and vertical rock faces), stepping down from 185m AOD at the highest point along the western rim down to the quarry floor, at approximately 100m AOD. The quarry is however visually well contained, with the undisturbed ground around the west of the quarry sloping gradually down from the 194m AOD on the western corner, to 190m AOD on the northern corner and dropping further to 180m AOD along part of the northern boundary. To the south, the undisturbed ground rises up to 200m AOD, with land along the eastern boundary then set down slightly at 160m AOD.

Most of the plant site area and access road are also on the lower ground at 102m AOD, except for the primary crusher which has its loading / turning area at 140m AOD. The plant is still contained by natural hillside and other landforms, albeit with varying degrees of visibility from the east (and the upper parts of the primary crusher being glimpsed in certain views to the north).

The site access point from the B4273, Ynysybwl Road to located to the east at 84m AOD and is offset from the plant site and workings via a switchback access and intervening mature vegetation.

A temporary soil storage mound (which has established grassland cover) is located on land to the west of the quarry. These materials are reserved for the restoration of the site.

The site is situated on the western side of Taffs Vale, some 1km north of the settlement of Pontypridd. The village of Glyncoch (and Glyncoch rugby football ground and clubhouse) lies immediately north of the northern boundary of the site. Open agricultural land lies to the northwest of the site, with the prominent wooded ridgeline of Coed Craig yr Hesg to the southwest (ancient and semi-natural woodland). There is a narrow corridor of trees and woodland between the site and the B4273 Ynysybwl Road, to the east.

Land cover within the Quarry and study area is shown on the aerial photograph (dated May 2020) on Drawing CYH 3, including the disturbed bare ground of the quarry workings, hardstandings, roads, plant and buildings, but with woodland and tree cover immediately to the north, east, south and south-west, with open fields to the west.

National Cycle Route 8 'The Taff Trail' follows the river north from Pontypridd to Abercynon and is at its closest point 350m to the east of the quarry, being set down in the valley floor at c60m AOD.

National Cycle Route 47 'The Celtic Trail' follows the minor road north west from Penygraigwen at a distance of 1km at its nearest from the quarry at 160m AOD and extending to 270m AOD near to Twyn y glog. A separate branch of National Cycle Route 47 connects Ynysybwl to the Taff Trail, extending to the north of Glyncoch, some 650m from the site, but set down in the valley from 150m AOD to 110m AOD.

The Taff Trail long distance footpath also follows the line of National Cycle Route 8 along the river to the east of the quarry. Further east (at 2km away from the site) the Rhymney Valley Ridgeway Path runs north from Mynydd Meio to Nelson over the elevated tops, at 354m AOD. Part of the Coed Craig yr Hesg woodland adjacent to the southern boundary of the Quarry is a designated Local Nature Reserve and includes a section of the 'Pontypridd Circular Walk'.

Land with public access rights (open access land) includes large areas of urban common to the east of the site at Cefn Eglwysilan; north-east at Craig-Evan-Leyshon Common; west of the site near Twyn y glôg; Mynydd y Glyn to the south of Porth; and three relatively small areas adjacent to the settlement of Pontypridd to the south. There is an established golf course 1km away at Pontypridd and Country Park at Barry Sidings at 2km away to the south-west (west of Pontypridd).

There are Conservation Areas at Trallwn in Pontypridd adjacent to the River Taff, as well as Pontypridd Town Centre, Graigwen, Troedrhiwtrwyn, and Broadway in Trefores. The nearest listed buildings include Taff Vale Railway Viaduct and Railway Bridge over Graig-yr-Hesg Road (both Grade II) and the Grade II* White Bridge, all of which are located to the south of the site. Ynysangharad Park in Pontypridd is a Grade II Registered Historic Park and Garden located 1km south of the quarry.

Landscape Classification

Overall, the site and study area are consistent with the descriptions in the published character assessments and the 2010 ES, being located within an undulating landscape of incised valleys and broad ridgelines, defined as "*hillside and scarp slopes mosaic*". The landscape setting is essentially upland in character, comprising an "*open landscape of rough grazing with conifer plantations, small woodland/broadleaf clumps creating a mosaic pattern*". The application site itself can be classified at a local level as "active quarry".

The approved restoration concept plan for the Quarry consists of mainly natural regeneration of species-rich grassland within the quarry floor, with a range of quarry bench treatments including bare rock, quarry waste, soiling and natural regeneration and soiling and planting, as well as naturalistic outcrop and scree slopes. At this stage, and once the successional vegetation has started to become established, the "active quarry" site would be re-classified as "sheltered valley (with mixed rocky grassland, scrub and woodland mosaic)" and would thus be well integrated into the local landscape.

Landscape Value

Overall, the landscape value of the site and study area has not changed from the assessment undertaken as part of the 2010 ES. It is of 'local' value due to the following factors (and the SLA local landscape designation extending over land immediately to the south and west):

- the site has a previously developed appearance, with buildings, plant and engineered topography/surface. The broader study area has a variable landscape quality, from locally designated semi-natural grassland and woodland habitat mosaics (LNR and SNIC), to areas affected by rugby football club management and agricultural use, as well as mosaic of built environment / settlement;

- scenic / visual quality varies from the confined views from within the quarry itself and with few views out, restricted views from the built up parts of settlements along the valley floor and lower valley sides, but with longer-distant views towards and/or from the elevated hillsides and ridges, often with attractive woodland cover;

- the previously developed land within the site is not considered to be a rare feature, but is representative of a land use that has taken advantage of the geology of the area (and provided construction materials for roads, etc) and is therefore locally distinct (Pennant sandstone quarry);
- areas identified as ancient and semi-natural woodland include the slopes immediately to the south and southwest of the quarry; this area extends into the western part of the site (but would not be disturbed as part of the approved development scheme);

- the enclosed nature of the quarry, being worked into the natural hillside and benefiting from mature trees and woodland cover provides some assimilation with the adjacent areas (as it is mainly hidden from views to the west, south and north), albeit contrasting with the aspects of the character of the wider, undeveloped parts of study area (e.g. with rock exposure textures, angular lines and often chaotic, but regular pattern);

- the study area has recreational uses both along public rights of way, long distance footpaths and National Cycle Routes, where visitors would appreciate the scenic qualities noted above, as well as other activities such as rugby football and golf courses;

- tranquillity is disturbed within and immediately surrounding the application site by plant and vehicles during working hours. However, tranquillity is more apparent outside of working hours and in the more rural and upland areas in the study area surrounding the site; and

- no evidence of artistic or literary associations with the application site or study area has been noted as part of this appraisal.

6.4.3 Potential Landscape Effects

The physical disturbance of landscape elements and features at the application site as part of the extension of time for the operational phases and subsequent final restoration would be limited and neutral in nature, and in landscape terms, would not change from the approved quarry development scheme.

The previously developed / active quarry, with visible or audible signs of human activity, has negligible susceptibility to the requested time extension proposal. This aspect, in combination with the local value of the site (described above), results in the sensitivity of the landscape to the type of development proposed, being no more than negligible. The 2010 ES concluded that the effects of the overall quarry development would be slight adverse / negligible, and this appraisal concludes that the effects of the time extension would similarly be negligible.

The physical disturbance of the approved quarry development scheme would result in the following changes to elements and features:

- progressive development of production benches up to the current edge of disturbance / approved quarry limits and basal levels, with no lateral expansion into undisturbed land;
- continued use of existing infrastructure, roads and access, plant and buildings, etc, with no new built development;
- retention of the temporary soil storage mound west of the site until such time that the material is required for restoration;
- bench treatments as part of restoration, where appropriate;
- restoration would utilise the existing soil materials in storage (and quarry waste / dust depending on availability) to provide mainly natural regeneration and mosaic of grassland, scrub and woodland cover, with exposed rock outcrops and slopes;
- there would be no visually significant or mature landscape elements or features removed or created; and

- duration of the extended workings would be short to medium-term, although certain tasks and effects would be shorter, with final restoration permanent.

The aesthetic and perceptual aspects within the application site and its immediate landscape setting would be as follows:

- the overall scale of the locally distinctive quarry site would remain as large;
- the sense of enclosure would remain as confined (few views out) and mainly hidden from view, with the regular pattern of uniform stone, rock exposure texture, angular lines and muted colours being broadly unchanged;
- vehicle and plant movements would continue during working hours, with use of the existing site access onto a public highway and the majority of HGVs travelling southwards along the B4273 to Pontypridd; and
- the existing strong sense of place / local distinctiveness of a sandstone quarry would continue, until final restoration when its overall character would soften to that of a sheltered valley, with the development of mosaic of rocky grassland, scrub and woodland habitats.

Thus, there would be limited alterations to landscape elements/features, aesthetic or perceptual aspects or characteristics during working and after restoration, which results in a low degree of change to the overall character of the baseline conditions (the change is discernible but the underlying landscape character as a result of the development would be similar to the baseline conditions).

At a local level, the proposed development would not alter the current classification of the application site as an “active quarry”, followed by its restoration to ““sheltered valley (with mixed rocky grassland, scrub and woodland mosaic)”, albeit over an extended period of time.

The development would be positioned within and would not alter the published key characteristics of the National Landscape Character Area “NLCA37 South Wales Valleys” or LANDMAP units.

There would thus be no changes to the principal findings of the LVIA undertaken as part of the 2010 ES, with the effects confined to a longer duration to complete the phased extraction programme, and a delay to the implementation of the final restoration strategy. This time extension and delay is considered to represent a slight adverse / neutral landscape effect.

6.5 Visual Assessment

6.5.1 Visual Baseline

The visual baseline included in the 2010 ES (including Figure 2.1 visual appraisal, Figure 2.2 zone of theoretical visibility, and the viewpoint photographs in Figures 3.1-3.2 and Figures 4.1-4.3) described the key visual receptors in the surrounding area which the current appraisal has confirmed to be largely unchanged.

Fieldwork was carried out to review the nature of views towards the quarry and also the degree of screening provided by vegetation and/or built up areas and buildings. Generally, this indicated that the undulating hillside and scarp slope mosaic topography, in combination with the landcover of trees and woodland in parts of the study area, significantly reduces the visibility of the existing quarry.

Screening is typically greatest to the north, west and south of the site and around the lower-lying areas and built up settlements and properties (such as west of Pontypridd, most of Glyncoch and Coed y Cwm and north-west towards Ynysybwl and along the River Taff), or heavily vegetated areas (such as around Coed Craig yr Hesg). Views typically become more open where land is elevated and/or begins to slope away, such as the unenclosed parts of Common Land to the east (such as Leyshon Common and Cefn Eglwysilan), or where hedgerows have been clipped short or removed, from gateways and road junctions, or the edges of settlements (such as Cilfynydd).

As was the case with the 2010 ES visual assessment, potential visual receptors therefore include the following:

- inhabitants of settlements, such as parts of Pontypridd to the south, Glyncoch and Coed-y-Cwm to the north, Cilfynydd and Bodwenarth to the east and isolated residential properties and farmsteads, such as on B4273 to the east, or elevated hilltops around Leyshon Common and Cefn Egwysilan;
- users of public highways such as B4273 and A470 to the east, or the minor roads leading from the hilltops to the east;
- users of public rights of way in the local area, including Taff Trail and Celtic Trail and users of sections of National Cycle Routes; and
- visitors to the rugby football club and Pontypridd golf course.

Representative Views

The representative viewpoints used for the appraisal have taken account of the following range of factors (and the work carried out in 2010 ES):

- accessibility to the public;
- potential number and sensitivity of viewers who may be affected;
- viewing direction, distance and elevation;
- nature of the viewing experience (for example static views, views from settlements and views from sequential points along routes);
- view type (for example panoramas, vistas and glimpses); and
- potential for cumulative views of the proposed development in conjunction with other developments.

The following representative viewpoints have been selected as part of this appraisal, with their locations shown on Drawing CYH 6/1, and annotated photographs of existing views shown on the individual drawings CYH 6/2 – 6/9 referenced after each viewpoint, all included within ES **Appendix 6**:

- Viewpoint 1 – View west from minor road to Leyshon Common (refer to Drawing CYH 6/2);
- Viewpoint 2 – View west from Oakland Terrace, Cilfynydd (refer to Drawing CYH 6/3);
- Viewpoint 3 – View west from Ffordd Tryweryn, Bodwenarth (refer to Drawing CYH 6/4);
- Viewpoint 4 – View south from Coed-y-Cwm View (refer to Drawing CYH 6/5);
- Viewpoint 5 – View north-west from access road to Pontypridd golf course (refer to Drawing CYH 6/6);
- Viewpoint 6 – View north-east from public right of way access to Gelli-lwch (refer to Drawing CYH 6/7);
- Viewpoint 7 – View south from Garth Avenue, Glyncoch (refer to Drawing CYH 6/8); and
- Viewpoint 8 – view south from Glyncoch rugby football club (refer to Drawing CYH 6/9).

The above photographs update the baseline views from these locations used in the 2010 ES, and were taken using a Nikon D5300 digital camera and tripod. 360 degree panoramic photographs were taken at each location and were digitally merged together using industry standard software and followed recognised guidance (Landscape Institute Technical Guidance Note 06/19). The annotated viewpoint photographs aim to represent the context and extent of the existing quarry / key features within the study area and are cropped to a 90 degree field of view.

6.5.2 Potential Visual Effects

The appraisal of potential visual effects has concentrated on publicly accessible viewpoints and mostly residential or recreational receptors located within Natural Resources Wales' National Landscape Character Area "NLCA37 South Wales Valleys" and therefore with a medium to high sensitivity to the type of change associated with the quarry development. Local road users are also represented, which typically have a low sensitivity to the type of change associated with the development.

Residential Receptors

The continued working at the site is not anticipated to be visible for most of the residents at Pontypridd. The settlement extends mostly over low-lying

ground along the Taff Vale at c70m AOD at 1km to the south and parts of the rising ground on each valleyside, typically up to c150m AOD (with the exception of the Penygraigwen area to the south-west which is more elevated). Views of the site are typically obscured by intervening buildings, landform and/or wooded valley sides, in particular at Coed Craig-yr-Hesg south of the site. The exception may be glimpsed views of the plant site and primary crusher from certain elevated locations on the eastern side of the settlement, for example:

- Viewpoint 5 is located on the minor road leading up to Pontypridd golf course at 1.2km south-east of the site. The elevated position is higher than much of Pontypridd settlement itself and the open aspect offers clear views of Coed Craig-yr-Hesg and the broad Taff Vale valley. Some of the upper faces of Craig-yr-Hesg Quarry, the plant site and primary crusher are visible below the skyline and amongst the wooded valley sides. The continued working in the quarry would be hidden and there would be no change to the proportion of the view occupied by the development. The plant site is grey coloured and recessive.

For residents at Glyncoch to the north, the continued working at the site is only likely to be noticeable from locations along the southern edge of the settlement. The settlement extends from low-lying ground along the Taff Vale and Nant Clydach to the north at c90m AOD and over rising ground to c160m AOD around the boundaries of the site. Thus, views are often orientated northwards away from the site. Views of the site are also typically enclosed by intervening buildings, landform and/or vegetation. The exception may be glimpsed views of the perimeter palisade security fencing, and/or mobile plant and vehicles from certain elevated locations, for example:

- Viewpoint 7 is located close to the bend on Garth Avenue, near the site boundary. The slightly elevated position and arrangement of properties along the road corridor offers a clear view towards Cefn Eglwyslian, with the trees along the site boundary providing some framing in the mid-ground. The continued working in the quarry would be hidden and there would be no change to the proportion of the view occupied by the development. Occasional mobile plant or vehicle movements may be noticeable during working hours; and
- Viewpoint 8 is located at Glyncoch Rugby Football Club access road on the edge of the settlement adjacent to the site boundary. The mown grassland provides short-range clear views towards the trees and site boundary fencing (with safety warning signage), which in-turn creates enclosure to the south. The continued working in the quarry would be hidden and there would be no change to the proportion of the view occupied by the development. Occasional mobile plant or vehicle movements may be noticeable during working hours.

Residents at Coed-y-Cwm have views typically orientated eastwards, due to the position of the settlement on the rising, western valley side (ranging from 70m AOD to 120m AOD). Notwithstanding the screening influence of other neighbouring buildings and/or vegetation within the settlement itself, the quarry is mostly hidden by the in-situ land to the north of the site and the vegetation around Glyncoch. The exception being glimpsed views of the top of the primary crusher, for example:

- Viewpoint 4 is located on Hafan Heulog at Coed-y-Cwm. The elevated position and arrangement of properties along the road corridor offers a clear view over part of the Taff Vale and towards the site. However, the only visible element is the top of the primary crusher building. The continued working in the quarry would be hidden and there would be no change to the proportion of the view occupied by the development. The plant is grey coloured and recessive.

Cilfynydd is located mostly on the lower valleyside to the east of the Taff Vale, at or below 150m AOD, whilst Bodwenarth (and Coed Bodwenarth) extends over the slightly higher ground up to 190m AOD. Thus, elevated, westwards views are often gained towards the site from these settlements, although the orientation of the dwellings themselves will also affect the degree of visibility for residents, for example whether the views would be direct or indirect (or oblique). Other neighbouring buildings within the settlement and/or vegetation may further obscure views. Nevertheless, glimpsed views of upper quarry faces and the plant site and primary crusher can be obtained from certain elevated locations, for example:

- Viewpoint 2 is located on Oakland Terrace, Cilfynydd. The elevated position and arrangement of properties along the road corridor and up the steep valleyside offers a clear view over the roof tops towards the site. Some of the upper faces of Craig-yr-Hesg Quarry and the primary crusher are visible below the skyline and amongst the wooded valley sides. Most of the continued working in the quarry would be hidden and there would be no change to the proportion of the view occupied by the development. The plant site is grey coloured and recessive; and

- Viewpoint 3 is located at Ffordd Tryweryn, Bodwenarth on the edge of the settlement with elevated panoramic views across the Taff Vale and surrounding hilltops and ridges. Some of the upper faces of Craig-yr-Hesg Quarry and the plant site and primary crusher are visible below the skyline and amongst the wooded valley sides. Most of the continued working in the quarry would be hidden, except for perhaps glimpsed views of the working of the upper western and northern benches and there would be no change to the proportion of the view occupied by the development. The plant site is grey coloured and recessive.

For the other inhabitants of residential properties along the B4273 to the east of the site, noticeable changes to views are not predicted due the extension of time, except for continuation of passing road vehicles accessing the site.

For the other inhabitants of isolated residential properties and farmsteads in the wider study area, such as around the elevated hilltops around Leyshon Common and Cefn Egwysilan, the changes to views will be influenced by the setting and context, in terms of garden vegetation or outbuildings. Glimpsed views of upper quarry faces and the plant site and primary crusher may be obtained from certain elevated locations, for example:

- Viewpoint 1 is located on the minor road to Leyshon Common and is close to farms such as Putwell and Trefychan. The open elevated position offers clear panoramic views towards the site and across the wide Taff Vale and surrounding hilltops and ridges. Some of the upper faces of Craig-yr-Hesg Quarry and the primary crusher are visible below the skyline and amongst the wooded valley sides. Most of the continued working in the quarry would be hidden and there would be no change to the proportion of the view occupied by the development. The plant site is grey coloured and recessive. The changing weather and sun position alters the appearance of the rock faces at certain times (dark at the time of this 2021 visit, but more brightly lit up in the photograph from this location in the 2010 ES).

Road and Recreational Routes and Facilities

The visibility from road and recreational routes and outdoor facilities, would inevitably be influenced by the transient and passing nature of the traveller / visitor and the direction of travel and position of the proposed development relative to the viewer (for example whether perpendicular to the route alignment and difficult to see, or along the route corridor and in the field of view of the driver, walker or cyclist). Furthermore, the presence of other existing focal points within the route corridor would influence the overall effect on visual amenity, as well as adjacent buildings and roadside vegetation, walls and other boundary features.

Thus, for road users travelling north or south along B4273 and A470, being set down in the Taff Vale at lower elevations to the site, the continued working of the site is unlikely to be perceptible. The continuation of road vehicles accessing the site would also form part of the existing road traffic for these receptors.

For road users travelling westwards along the minor roads leading from the hilltops to the east, clear elevated views are likely, but only over limited sections. The wider panoramic views of the surrounding distant hills would also detract views away from any activities at the site. Refer to Viewpoint 1 above and also Viewpoint 5 from Eglwysilan Road in the 2010 ES.

Users of public rights of way in the local area follow a range of routes and potential visibility of the site. For example refer to Viewpoint 1 above for elevated positions at Leyshon Common to the east of the site, whilst Viewpoint 4 in the 2010 ES illustrates views from bridleway on Cefn Eglwysilan and Viewpoint 7 in the 2010 ES is located on the footpath extending northwards

from Coed-y-Cwm. In these cases, even though parts of the site are currently visible, most of the continued working in the quarry would be hidden and there would be no change to the proportion of the view occupied by the development.

Other routes will be more enclosed and visibility of the site more restricted, for example Viewpoint 6 which is located on the public right of way access to Gelli-lwch Farm and has several other footpaths branching from it. The elevated position offers panoramic across the undulating hilltops and ridges, with a mixture of farmland, woodland and upland moorland. The site is set down and hidden from view and the extended period of working is not anticipated to be visible for these receptors.

Walkers and cyclists using Celtic Trail and National Cycle Route 47 which follows an undulating route and at times being set down in the valley floor and/or separated from the site by landform and often passing amongst tree and woodland cover will have restricted views. The position of the site would be offset at its nearest point (1km away). The continued working in the quarry is not anticipated to be noticeable for these receptors. Also refer to Viewpoint 10 in the 2010 ES.

Walkers and cyclists using 'The Taff Trail' and National Cycle Route 8 will be set down in the valley floor and often be amongst tree and woodland cover which will restrict views. The position of the site would be offset at its nearest point (0.3km away). The continued working in the quarry is not anticipated to be noticeable for these receptors.

Visitors to the rugby football club would have views of the site boundary upon arrival, although their focus is likely to turn to any games. As noted for the description of Viewpoint 8 above, the site boundary fencing (with safety warning signage), and associated tree below creates enclosure to the south of the club. The continued working in the quarry would be hidden and there would be no change to the proportion of the view occupied by the development. Occasional mobile plant or vehicle movements may be noticeable during working hours.

Visitors leaving the Pontypridd golf course will obtain elevated, distant views of the site from the access road, as described in Viewpoint 5. However, most of the golf course itself is covered with established tree belts marking the fairways and which obscures views. The focus of any visitors is also likely to be on playing and appreciating the landscape more generally. The continued working in the quarry is not anticipated to be noticeable for these receptors.

General Views and Visual Amenity

Overall, the effect on views and visual amenity of the selected representative viewpoints and associated visual receptors are limited and neutral. This is primarily due to the configuration of the existing quarry and characteristics of the plant site (and primary crusher) as well as the undisturbed land and woodland, the offsite topography and vegetation cover, and with little to no change likely to be apparent. The underlying landscape character or view composition would be the same as the baseline at most locations. Continued vehicle movements would be an indirect adverse visual effect, albeit along the existing routes and road corridors. Restoration treatments would ensure softening of the appearance of the upper faces and beneficial effects, at the earliest opportunity.

6.6 Conclusions

This appraisal of potential landscape and visual effects has concluded that the proposed development is unlikely to be detrimental to the overall character and / or appearance of the site and its surrounding environment.

At a local level, the proposed development would not alter the current classification of the site as an "active quarry", followed by its restoration to "sheltered valley (with rocky grassland, scrub and woodland)", albeit over an extended period of time.

The proposed development would not alter the key characteristics of the Natural Resources Wales' National Landscape Character Area "NLCA37 South Wales Valleys".

The baseline description within LANDMAP, in particular of the Taff Valley, with inter alia the "*large working Glyncoch (Craig yr Hesg) Pennant sandstone quarry*" and the "Ynysybwl" hillside and scarp slope mosaic, would be unaltered as a result of the proposed development.

The proposals would not reduce the existing and effective mitigation measures at the site, with existing views anticipated to be largely unchanged. This would ensure that the extended period of quarrying activities would be well integrated into the landscape and the restoration proposals would still add to the overall landscape value (whilst in the interim the site continues to provide for local roadstone requirements).

The development proposals would not cause unacceptable harm to the important landscape character of the nearby SLA. The unspoilt valley slopes and ridges which form a visual backdrop to the settlements of the area would be unaffected by the proposed development.

Although the extension of time would delay the final restoration of the site, the existing mineral working would continue to be well integrated into the surrounding landscape, due to the surrounding topography and high woodland cover.

7.0 ECOLOGY

7.1 Introduction

This Chapter comprises an Ecological Impact Assessment (EcIA) to provide decision-makers with information about the effects which have been predicted to occur on ecological features and their likely significance associated with the continued operation and restoration of Craig-yr-Hesg Quarry.

The current schedule of planning conditions regulating operations at Craig-yr-Hesg Quarry includes a condition which requires the cessation of quarrying operations by 31st December 2022 (ref condition 1 of the ROMP schedule of conditions issued in April 2013, [08/1380/10]). There will be remaining reserves sufficient for circa six years extraction beyond December 2022, and therefore this EcIA is undertaken as part of a 'Section 73' application submitted to the Planning Authority, Rhondda Cynon Taff (RCT), seeking permission to continue quarrying operations for a further six-year period to December 2028 (plus a further 12 month period to enable the removal of residual stocks.

Craig-yr-Hesg Quarry is located approximately 0.5 kilometres (km) north of Pontypridd, South Wales. The boundary of the application site (hereafter referred to as the site) is shown on Figure EC1. The site is broadly centred on National Grid Reference (NGR) ST 076 916.

7.1.1 Site Description

The site comprises an active sandstone quarry which has been worked (in terms of habitat losses and overburden removal) to its full permitted lateral and depth limits, although a degree of extraction remains to achieve final face positions. As such, the majority of the site comprises active mineral extraction and processing areas with only minimal vegetated areas associated with the periphery of the quarry void and self-sown scrub which has established on internal bunds.

The extent of the active quarry is demarcated by a palisade security fence, beyond which is Craig-yr-Hesg Local Nature Reserve to the south and east, the village of Glycoch to the north and agricultural land to the west.

7.1.2 Details of the Proposed Development

The proposed development relates to the continued operation of the site for an additional seven years until 2029. These future operational activities will comprise working existing middle and lower benches in a generally westerly direction to their final pre-restoration positions, followed by implementation of final restoration works, all as currently approved and conditioned via the ROMP schedule of conditions. There would be no material change to this approved scheme, and the application is confined to seeking a time extension in order to fully implement the approved scheme and extract the remaining reserves.

As such, the continued operation of the site for an additional six years would not result in any loss or disturbance of semi-natural habitats beyond the current operational area. Further details are provided in Chapter 3.0 and Figures 3.1 – 3.6.

7.1.3 Purpose of this EcIA

The purpose of the EcIA is to:

- describe the baseline data collection and assessment methods used;
- summarise the baseline ecological conditions, including consideration of whether there have been any material changes since the EcIA undertaken in 2009 as part of the ROMP EIA, and the EcIA undertaken in 2014 as part of the western extension EIA;
- identify and describe all potentially significant ecological effects associated with the continued operation of the site;
- set out the design, mitigation and compensation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects;
- identify how mitigation and compensation measures will be delivered;
- provide an assessment of the significance of any residual effects in relation to the effects on biodiversity;
- identify appropriate enhancement measures and how these will be delivered; and
- set out any requirements for monitoring.

Previous Environmental Statements provide an important source of background information for the site. EcIA's were undertaken in 2009 (ROMP) and 2014 (western extension) which included surveys and assessments of the existing quarry (2009) and existing quarry fringe (2014). The 2009 study did not identify any ecological constraints at the existing quarry which would affect the ongoing operation, but a planning condition was attached to the ROMP review schedule of conditions requiring the submission of a 'Wildlife Protection Plan' (re condition 42). This was duly submitted but has not been approved, and it had been agreed with RCT that further consideration of the requirement would be held in abeyance pending the determination of the western extension application where, if approved, a wider requirement for a Species Protection and Habitat Management Plan would have been imposed as an updated condition to also cover the extension area.

This application provides an opportunity to revisit the requirement to provide a 'Wildlife Protection Plan' by providing such a Plan in the form of an Ecological Management Plan (EMP) for the existing quarry. As such, in addition to the EcIA, an EMP has also been produced, which details the measures proposed to ensure that important ecological features are suitably protected during the continued operation and restoration of the site, and that ecological enhancements are provided as part of the restoration process. The EMP is provided in **Appendix 7.3** and draws upon aspects identified for protection during the 2010 ROMP process and subsequent ecological surveys at the site.

7.1.4 Relevant Legislation and Policy

National Policy

National Planning Policy (Wales)

Planning Policy Wales Edition 11, February 2021 (PPW11) sets out the land use planning policies of the Welsh Government. The primary objective of PPW is to ensure that the planning system contributes towards the delivery of sustainable development and improves the social, economic, environmental and cultural well-being of Wales. Section 6.4 of PPW11 relates to biodiversity and ecological networks.

Paragraph 6.4.3 of PPW11 states that:

"The planning system has a key role to play in helping to reverse the decline in biodiversity and increasing the resilience of ecosystems, at various scales, by ensuring appropriate mechanisms are in place to both protect against loss and to secure enhancement."

It goes on to state that:

"Development plan strategies, policies and development proposals must consider the need to:

- *support the conservation of biodiversity, in particular the conservation of wildlife and habitats;*
- *ensure action in Wales contributes to meeting international responsibilities and obligations for biodiversity and habitats;*
- ensure *statutorily and non-statutorily designated sites are properly protected and managed;*
- *safeguard protected and priority species and existing biodiversity assets from impacts which directly affect their nature conservation interests and compromise the resilience of ecological networks and the components which underpin them, such as water and soil, including peat; and*
- *secure enhancement of and improvements to ecosystem resilience by improving diversity, condition, extent and connectivity of ecological networks."*

Section 6.4 goes on to set out policy in respect of:

- The Biodiversity and Resilience of Ecosystems Duty, as set out in Section 6 of the Environment (Wales) Act 2016;
- Designated Sites, including:
  - Sites of Special Scientific Interest;
  - Special Protection Areas, Special Areas of Conservation and Ramsar Sites;
  - Proposed Special Areas of Conservation, Special Protection Areas and Ramsar sites; and
  - Non-statutory Designations.

- Protected Species; and
- Trees, Woodlands and Hedgerows.

PPW11 is supplemented by a series of Technical Advice Notes (TANs), Welsh Government Circulars, and policy clarification letters, which together with PPW11 provide the national planning policy framework for Wales. TAN 5 deals with Nature Conservation and Planning and states in paragraph 2.4:

"When considering policies and proposals in local development plans and when deciding planning applications that may affect nature conservation, local planning authorities should:

- *Pay particular attention to the principles of sustainable development, including respect for environmental limits, applying the precautionary principle, using scientific knowledge to aid decision making and taking account of the full range of costs and benefits in a long term perspective;*
- *Contribute to the protection and improvement of the environment, so as to improve the quality of life and protect local and global ecosystems, seeking to avoid irreversible harmful effects on the natural environment;*
- *Promote the conservation and enhancement of statutorily designated areas and undeveloped coast;*
- *Ensure that appropriate weight is attached to designated sites of international, national and local importance;*
- *Protect wildlife and natural features in the wider environment, with appropriate weight attached to priority habitats and species in Biodiversity Action Plans;*
- *Ensure that all material considerations are taken into account and decisions are informed by adequate information about the potential effects of development on nature conservation;*
- *Ensure that the range and population of protected species is sustained;*
- *Adopt a step-wise approach to avoid harm to nature conservation, minimise unavoidable harm by mitigation measures, offset residual harm by compensation measures and look for new opportunities to enhance nature conservation; where there may be significant harmful effects local planning authorities will need to be satisfied that any reasonable alternative sites that would result in less or no harm have been fully considered."*

Local Policy

The existing Rhondda Cynon Taf Local Development Plan (LDP) was adopted in March 2011. It sets out Rhondda Cynon Taf County Borough Council's vision and strategy for the county borough. Relevant passages from the Plan are as follows: -

Policy AW 6 - Design and Placemaking

Development Proposals will be supported where: - … 14. The design protects and enhances the landscape and biodiversity;

Policy AW 8 - Protection And Enhancement Of The Natural Environment

Rhondda Cynon Taf's distinctive natural heritage will be preserved and enhanced by protecting it from inappropriate development. Development proposals will only be permitted where:-

1. They would not cause harm to the features of a Site of Importance for Nature Conservation (SINC) or Regionally Important Geological Site (RIGS) or other locally designated sites, unless it can be demonstrated that:-

a) The proposal is directly necessary for the positive management of the site; or

b) The proposal would not unacceptably impact on the features of the site for which it has been designated; or

c) The development could not reasonably be located elsewhere and the benefits of the proposed development clearly outweigh the nature conservation value of the site.

2. There would be no unacceptable impact upon features of importance to landscape or nature conservation, including ecological networks, the quality

of natural resources such as air, water and soil, and the natural drainage of surface water.

All development proposals, including those in built up areas, that may affect protected and priority species will be required to demonstrate what measures are proposed for the protection and management of the species and the mitigation and compensation of potential impacts. Development proposals must be accompanied by appropriate ecological surveys and appraisals, as requested by the Council. Development proposals that contribute to the management or development of Ecological Networks will be supported.

Environment (Wales) Act 2016

The Environment (Wales) Act puts in place the legislation needed to plan and manage Wales' natural resources in a more proactive, sustainable and joined-up way. Part 1 Section 6 of the Act introduces a new biodiversity duty, which replaces and enhances the biodiversity duties set out in the NERC Act 2006 and requires public authorities to seek to maintain and enhance biodiversity in the exercise of their functions and in so doing promote the resilience of ecosystems.

Section 7 of the Act lists living organisms and types of habitat in Wales, considered to be of key significance to sustain and improve biodiversity in relation to Wales.

Local Biodiversity Action Plan

The Rhondda Cynon Taff Local Biodiversity Action Plan (LBAP) *Action for Nature*[1] identifies habitats and species that are targeted for positive action at a more local level.

7.1.5 Legislation

Many individual wildlife species receive statutory protection under a range of legislative provisions. Local authorities should take measures to protect the habitats of these species from further decline through policies in local development documents.

A summary of legislation relevant to (onshore) biodiversity in Wales is provided below. Note that the summary provided here is intended for general guidance only and the original legislation should be consulted for definitive information.

Conservation of Habitats and Species Regulations 2018

The Conservation of Habitats and Species Regulations 2018 (the Habitats Regulations) consolidate the Conservation of Habitats and Species Regulations 2010 with subsequent amendments. The Regulations transpose Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora (EC Habitats Directive), into national law. Under the Habitats Regulations it is an offence to deliberately capture, kill or disturb1 wild animals listed under Schedule 2 of the Regulations. It is also an offence to damage or destroy a breeding site or resting place of such an animal (even if the animal is not present at the time).

Wildlife & Countryside Act 1981

The Wildlife and Countryside Act 1981, as amended by the Countryside and Rights of Way (CRoW) Act 2000 and the Natural Environment and Rural Communities (NERC) Act 2006, consolidates and amends existing national legislation to implement the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) and Council Directive 79/409/EEC on the Conservation of Wild Birds (Birds Directive), making it an offence to:

[1] https://www.rctcbc.gov.uk/EN/Resident/PlanningandBuildingControl/LocalDevelopmentPlans/LDPEvidenceBaseLibraryandAnnualMonitoringRe/RelateddocumentsEvidenceBase/EB47b.pdf

- Intentionally kill, injure or take any wild bird or their eggs or nests (with certain exceptions) and disturb any bird species listed under Schedule 1 to the Act, or its dependent young while it is nesting;
- Intentionally kill, injure or take any wild animal listed under Schedule 5 to the Act;
- intentionally or recklessly damage, destroy or obstruct any place used for shelter or protection by any wild animal listed under Schedule 5 to the Act;
- intentionally or recklessly disturb certain Schedule 5 animal species while they occupy a place used for shelter or protection;
- Pick or uproot any wild plant listed under Schedule 8 of the Act; or
- Plant or cause to grow in the wild any plant species listed under Schedule 9 of the Act.

7.2 Methodology

7.2.1 Scope

The scope of this EcIA, i.e. the collection of baseline data, evaluation of ecological resources and description and assessment of the significance of impacts, follows guidelines set out by the Chartered Institute of Ecology and Environmental Management (CIEEM 2018)[2] and references therein.

All ecologists that have led survey work and reporting associated with the EcIA are members of CIEEM and follow the Institute's Code of Professional Conduct when undertaking ecological work.

7.2.2 Baseline Data Collection

Pre-existing Site Information

Previous Environmental Statements provide an important source of background information for the site. EcIA's were undertaken in 2009 (ROMP) and 2014 (western extension) which included surveys and assessments of the existing quarry (2009) and existing quarry fringe (2014).

Reference is made to these surveys as appropriate in Section 7.3.

Desk Study

In December 2020, a desk study was undertaken centred on NGR ST 076 916). This provided a minimum 1km area of search from the site boundary which was considered appropriate given no further land take is required.

The desk study included a review of the following sources of information:

- South East Wales Biodiversity Records Centre (SEWBReC, the Local Biological Records Centre) data request for protected and notable species records and details for non-statutory designated sites for nature conservation;
- MAGIC website[3] for statutory ecological designated sites and habitat inventories;
- Natural Resources Wales Website[4]; and
- Lle Geo-Portal for Wales[5].

A summary of the information collated from these organisations is included within this EcIA with further details provided in **Appendix 7.1**..

[2] CIEEM (2018) Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater and Coastal. Chartered Institute of Ecology and Environmental Management, Winchester.

[3] www.magic.gov.uk

[4] https://naturalresources.wales/guidance-and-advice/environmental-topics/wildlife-and-biodiversity/protected-areas-of-land-and-seas/find-protected-areas-of-land-and-sea/)

[5] https://lle.gov.wales/catalogue?lang=en&c=2007

In addition, site specific information is available from the 2010 ROMP application, as follows:

- Extended Phase 1 Habitat Survey with selected classification to National Vegetation Classification;
- Breeding bird survey;
- Bat activity survey;
- Badger survey; and
- Reptile survey.

Field Survey

To inform the EcIA study, a Phase 1 habitat survey of the existing quarry and the immediate surrounding area has been undertaken following the standard methodology for Phase 1 habitat survey; this approach was developed by the Joint Nature Conservation Committee (JNCC) in the mid 1980's and has, as its core, the utilisation of a standardised series of colour, symbols and descriptive categories to record habitats, species and other physical features.

The methodology was developed in order to allow a quick, universal, means of mapping semi-natural and other habitats at up to a county scale. A Phase 1 survey therefore provides a consistent approach to habitat recording and evaluation, and a means of identifying features which may be of value for protected species through the use of target notes.

The Phase 1 survey was 'extended' to include an assessment of the potential for protected species to occur within or adjacent to the study area.

The Phase 1 survey was undertaken on the 7th January 2021. The resultant habitat map is shown as **Drawing EC1** and habitat descriptions provided as **Target Notes (TN)** which are based upon the JNCC methodology.

The habitat survey was extended to include an assessment of the potential of the site to support legally protected or notable species, and a search for field signs of such species, as follows:

- The site and a 30m radius (where accessible) was searched for badger setts and field signs;
- Trees within the site (where accessible) were subject to a ground-level assessment to search for features that could be suitable for roosting bats (Potential Roosting Features (PRFs) using criteria contained within current Bat Conservation Trust guidelines[6], see Table 7-1. Survey was aided by the use of binoculars. Potential suitable bat foraging and commuting habitat on the site was also recorded;
- The site was assessed for its potential to support amphibians and reptiles;
- The site was assessed for its potential to support an assemblage of breeding birds of conservation value, and incidental sightings recorded; and
- The site was assessed for its potential to support an invertebrate assemblage of conservation importance.

No detailed habitat surveys (i.e. Phase 2) or protected species surveys were deemed to be necessary to inform the EcIA as the quarry void has reached its full lateral extent and depth. Some protected species will require further consideration during the restoration phase and appropriate mitigation measures have been proposed within this EcIA to address this.

[6] Collins, J. (ed.) (2016). *Bat Surveys for Professional Ecologists: Good Practice Guidelines (3rd edn).* The Bat Conservation Trust, London.

Table 7-1 – Criteria for Assessing Bat Roost Potential of Buildings and Trees[8]

Category	Description
Negligible value	Building or tree where surveyor has not identified any suitable potential roosting features, or where those that are present are of such poor quality or condition[7], such that bats are highly unlikely to use them.
Low value	Building or tree with one or more potential roost sites that could be used by individual bats opportunistically. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats.
Moderate value	Building or tree with one or more potential roost site that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but which are unlikely to support a roost of high conservation status (with respect to roost type only – the assessments in this table are made irrespective of species conservation status, which is established after presence is confirmed).
High value	Building or tree with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat.

Limitations

Desk Study

Desk study data is unlikely to be exhaustive, especially in respect of species, and is intended mainly to set a context for the EcIA study. It is therefore possible that important habitats or protected species not identified during the data search do in fact occur within the local area. However, given the quarry has already reached its full extent this is not considered likely to represent a significant constraint.

Interpretation of maps and aerial photography has been conducted in good faith, using recent imagery, but it has not been possible to verify the accuracy of any statements relating to land use and habitat context outside of the field study area.

Field Survey

It should be noted that lack of evidence of a species does not necessarily preclude it from being present at a later date. Due to the nature of the subjects of ecological surveys it is feasible that species that use the site may not have been recorded by virtue of their seasonality, cryptic behaviour, habit or random chance.

The habitat survey was undertaken outside of the optimum period for botanical recording. However, the quarry void is already at its full extent and no further loss of habitat is required to enable completion of the permitted quarry development.

Furthermore, surveys of the habitats beyond the operational area but within the site boundary, as shown on **Drawing EC1**, have previously been undertaken at an appropriate time of year for botanical recording in order to inform previous planning applications. The 2021 survey included visual verification that these habitats remain broadly comparable although a degree

[7] For example, in terms of temperature, humidity, height above ground level, light levels or levels of disturbance.

of natural ecological succession was noted to have occurred, as set out in the Baseline section.

As such, it is concluded that sufficient desk study and site survey information has been collated to complete a thorough EcIA of the continued operation of the site, particularly when taking into account that the quarry void has reached its full lateral and depth extents.

7.2.3 Assessment Approach

The ecological evaluation and impact assessment approach used in this report is based on Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland ("CIEEM guidelines").

Important Ecological Features

Ecological features can be important for a variety of reasons and the rationale used to identify them is explained in the text. Importance may relate, for example, to the quality or extent of the site or habitats therein; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

Determining Importance

The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case, relying on known/ published accounts of distribution and rarity where available, and professional experience:

- International;
- National (i.e. Wales);
- Regional (i.e. South Wales);
- County Borough Local authority area (i.e. Rhondda Cynon Taff);
- Local (i.e. within circa 5km i.e. Pontypridd); and
- Site (i.e. Craig-yr-Hesg SINC).

The above frame of reference is applied to the ecological features identified during the desk study and surveys to inform this EcIA.

The value of habitats has been measured against published selection criteria where available. Examples of relevant criteria include: descriptions of habitats listed on Annex 1 of the Habitats Directive; descriptions of habitats of principal importance for biodiversity under Section 7 of the Environment Act Wales; Local Wildlife Site Selection Criteria; and features identified in the Rhondda Cynon Taff Action for Nature plan.

In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Reference has therefore been made to published lists and criteria where available. Examples of relevant lists and criteria include: species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive or Annex 1 of the Birds Directive); species of principal importance for biodiversity under the Environment Act Wales and Birds of Conservation Concern[8].

For the purposes of this report ecological features of Local importance or greater and/ or subject to legal protection have been subject to detailed assessment. Effects on other ecological features are considered unlikely to be significant in legal or policy terms.

Impact Assessment

The impact assessment process involves the following steps:

- identifying and characterising potential impacts;
- incorporating measures to avoid and mitigate (reduce) these impacts;
- assessing the significance of any residual effects after mitigation;
- identifying appropriate compensation measures to offset significant residual effects (if required); and

[8] Eaton, M.A., Aebischer, N.J., Brown, A., Hearn, R.D., Lock, L., Musgrove, A.J., Noble, D.G., Stroud, D.A., & Gregory, R.D. (2015). Birds of Conservation Concern 4: the population status of birds in the UK, Channel Islands and Isle of Man. *British Birds*, 108: 708-746.

- identifying opportunities for ecological enhancement.

When describing impacts, reference has been made to the following characteristics, as appropriate:

- Positive or negative;
- Extent;
- Magnitude;
- Duration;
- Timing;
- Frequency; and
- Reversibility.

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g. the physical loss of habitat occupied by a species during the operational quarrying process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process or feature, e.g. the dewatering of the quarry void resulting in hydrological changes, which, in the absence of mitigation, could lead to the drying out of adjacent habitats, though noting that no dewatering of the quarry void is required at Craig-yr-Hesg.

Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure and functions as well as its distribution and its typical species within a given geographical area.
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

Significant Effects

The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of CIEEM guidelines. Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of EcIA, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g. for a designated site) or broad (e.g. national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed or permitted plans and projects, can result in significant effects.

Avoidance, Mitigation, Compensation and Enhancement

When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a national scale should ensure no net loss of the population at that scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM Guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

It is important for the EcIA to clearly differentiate between avoidance, mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g. through changes in scheme design;
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact *in situ*;
- Compensation describes measures taken to offset residual effects, i.e. where mitigation *in situ* is not possible; and
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

7.3 Ecological Baseline

7.3.1 Ecological Designations

A summary of the ecologically designated sites identified within the desk study search area is provided in Table 7-2 below. All sites identified are Sites of Importance for Nature Conservation (SINC) which are identified as being important in the context of RCT.

Citations and site information received during the desk-top study have been provided within **Appendix 7.1.**

Table 7-2 Summary of Ecologically Designated Sites within the 2km Search Area

Site Name and proximity to Application Site Boundary	Reason for Importance
Craig-yr-Hesg Local Nature Reserve – adjacent to southern boundary of the site. (This land was gifted by Hanson to the predecessor authority Taff Ely Borough Council in 1993).	Part of the SINC area (see below for habitat descriptions) has been designated as a LNR formalising public access and use of the woodland habitat.
Craig-yr-Hesg/Lan Wood SINC - partially within Phase 1 study area (TN 3), but outside the proposed development area, and present adjacent to Craig-yr-Hesg Quarry. (As part of the western extension application, Hanson offered to dedicate 4.6 ha of land within the SINC to RCT as a potential extension to the LNR, but the offer was declined by RCT).	The SINC designation extends to 89.72ha and is predominantly ancient semi-natural woodland, with evidence of former quarry/coal workings and natural rock outcrops, with smaller areas of grassland and bracken habitats. The SINC has associated faunal interest, in particular woodland birds.
Taff and Rhondda Rivers – c.0.3km east.	Recognised as a 'major biodiversity artery' the river catchment has high faunal interest, including otter, salmonid fishes, birds and a diverse range of associated riparian habitats including carr woodland, floodplain grassland and scrub/woodland.
Lower Clydach Woodlands – c.0.5km north.	Semi-natural (and part ancient) woodland occurring along a steep sided valley of the Nant Clydach. The SINC also contains areas of dry grassland / bracken and species-rich marshy grassland.
Llys Nant and Craig Twyn-y-glog Woodlands – c.0.84km north-west.	A mosaic of habitats including an upland stream which is likely to have associated faunal interest for birds such as dipper and salmonid fishes.

Site Name and proximity to Application Site Boundary	Reason for Importance
	The SINC also contains areas of species-rich broadleaved woodland and conifer plantation.

Craig-yr-Hesg/Lan Wood SINC and Taff and Rhondda Rivers SINC are taken forward for further consideration in the EcIA due to their proximity to the site and the potential for there to be indirect impacts on these sites as a result of the continued operation of the site.

The majority of the SINC designated area is also identified as 'restored ancient woodland' by the SEWBReC report.

There are no predicted impact pathways in respect of the remaining sites identified in Table 7-2, due to their separation from the site and absence of identified impact pathways.

As such, the remainder of the sites are not taken forward for further assessment within this EcIA.

7.3.2 Habitats

The results of the habitat survey are shown on **Drawing EC2** with Target Note (TN) references provided in Table 7-3 and photographs presented as **Appendix 7.2**.

It should be noted that habitat descriptions given draw upon the findings of the 2021 survey and those previously undertaken to inform previous planning applications.

Table 7-3 Target Note Descriptions

Target Note	Description
1	**Semi-Natural Broadleaved Woodland** Beyond the quarry void a strip of woodland occurs which has increased in canopy cover since the 2010 surveys and now forms more continuous woodland habitat although tree age suggests much is secondary in nature. Silver birch (*Betula pendula*) dominates with limited understorey and ground flora characterised by stands of bracken (*Pteridium aquilinum*) and acid grassland along rides or clearings associated with informal footpaths. Willow scrub occurs locally, typically being dominated by grey willow (*Salix cinerea*). Other species include silver birch, goat willow (*Salix caprea*), rowan (*Sorbus aucuparia*) and pedunculate oak (*Quercus robur*).
2	**Semi-Improved Grassland** A gently sloping field immediately to the west beyond the application site boundary of previously managed grassland, with a sward height of less than 5cm. Grasses are dominant in the sward, with sweet vernal grass (*Anthoxanthum ordoratum*), common bent (*Argostis capillaris*), crested dog's tail (*Cynosurus cristatus*) occurring in abundance. Also present on an occasional to frequent basis is Yorkshire fog (*Holcus lanatus*), red fescue (Festuca rubra), perennial rye (*Lolium perenne*), and smooth meadow grass (*Poa pratensis*). Herbaceous species were largely not evident during the January 2021 survey but have previously been found to occur infrequently but include; rough hawkbit (*Leontodon hispidus*), creeping buttercup (*Rancunculus repens*), ribwort

Target Note	Description
	plantain (*Plantago lanceolata*), cat's ear, (*Hypochaeris radicata*) and common field speedwell (*Veronica persica*). Closest to the quarry edge (southern end of field) bracken forms dominant stands and here the sward also contains occasional yellow rattle (*Rhinanthus minor*) and bird's foot trefoil (*Lotus corniculatus*). To the north-east of the field and TN2 there is a mosaic habitat of tall ruderal vegetation and scrub. This area has previously been disturbed by previous quarry extensions and has been re-colonised by bramble, with patches of soft rush (*Juncus effusus*), rosebay willowherb (*Chamerion angustifolium*) and broad-leaved dock (*Rumex obtusifolius*). Remnants of the grassland sward mentioned above also occur.
3	**Semi-Natural Broadleaved Woodland** This area is part of Craig-yr-Hesg Local Nature Reserve and Craig-yr-hesg/Lan Wood SINC. Several parts of this are identified as ancient semi-natural woodland on the Ancient Woodland Inventory (AWI). The wood consists predominantly of continuous broadleaved woodland with a few scattered openings in the canopy where bracken dominates, and bluebells (*Hyacinthoides non-scripta*) occur frequently. The woodland canopy layer is locally dominated by silver birch with beech (*Fagus sylvatica*), ash (*Fraxinus excelsior*) and rowan also present. The shrub layer comprises hazel (*Corylus avellana*), holly (*Ulex aquafolium*) and hawthorn (*Crataegus monogyna*) over patches of bramble and scattered bluebell.

Target Note	Description
4	**Quarry** The quarry is operational and subject to very high levels of disturbance as a result of active mineral extraction and processing operations. As a result, established vegetation is limited and typically opportunistic species such as red valerian (*Centhranthus ruber*) and butterfly bush (*Buddleja davidii*). The main exception is described by TN 9.
5	**Settlement Lagoon** Settlement lagoons associated with the sites operational dust suppression and wheel wash systems, these are concrete lined highly turbid and lack vegetation.
6	**Semi-Natural Broadleaved Woodland** The woodland to the east of the southern edges of the quarry void also forms part of Craig-yr-Hesg/Lan Wood SINC and is identified as ancient semi-natural woodland. Tree age and cover is more extensive when compared to TN 1 although direct access is restricted due to slope gradient and exposed cliffs. The species present include more frequent pedunculate oak compared to the area described by TN1, however silver birch remains occasional to frequent and beech, rowan, holly and ash are all occasional. The shrub layer is variable but includes hazel, young birch and willow, with bramble frequent to locally abundant. Limited ground flora was evident during the January 2021 survey, but previous surveys have identified the ground flora comprises male-fern (*Dryopteris felix-mas*), ivy (*Hedra helix*),

Target Note	Description
	broad buckler-fern (*Dryopteris dilitata*), scaly male-fern (*D. affinis*), hard fern (*Blechnum spicant*), wood avens (*Geum urbanum*), wood-sage (*Teucrium scorodonia*), barren strawberry (*Potentilla sterilis*) and creeping bent.
7	**Quarry Buildings** This area comprises the quarry offices, weighbridge, car parking and maintenance sheds etc, all occupying hard standing and areas of bare unvegetated ground.
8	**Dense Scrub** Silver birch scrub has established and dominates peripheral areas and edge protection bunds within the quarry with occasional oak, butterfly bush and rowan. North east of this some areas have evidently been planted in the past. A degree of non-native planting has been undertaken, assumed to provide screening, with alder (*Alnus sp.*) being most frequent.
9	Scrub The most established vegetation 'within' the operational quarry, having established along an edge protection bund associated with an internal haul road. Gorse (*Ulex europeaus*) is dominant with occasional heather (*Calluna vulgaris*) also noted.
10	Japanese knotweed
	A small (c.2m^2 in January 2021 although the true extent may be greater than evident at time) stand of Japanese knotweed (*Fallopia japonica*) present within the application site boundary but beyond the operational are defined by palisade fencing. The 2010 survey previously identified a second stand, again beyond the operational area, which was not evident in January 2021 although this was likely due to time of year.

7.3.3 Species Baseline

Plants

Protected and Notable Flora

The desk study identified 487 records relating to 153 plant species within the search area.

This included a large number of notable plant species, including bluebell (*Hyacinthoides non-scripta*), a species listed on Schedule 8 of the Wildlife and Countryside Act 1981, which was recorded at Craig-yr-Hesg/Lan Wood SINC immediately north of the site. There are numerous records of locally important plant species from Craig-yr-Hesg/Lan Wood SINC, including bilberry (*Vaccinium myrtillus*), navelwort (*Umbilicus rupestris*), wood speedwell (*Veronica montana*), great wood rush (*Luzula sylvatica*) and devil's bit scabious (*Succisa pratensis*). These occur in semi-natural habitats which, although partially within the site boundary, are beyond the quarry development area and will be retained. The SEWBReC report contains records of 12 locally important plant species within the quarry void itself, however, this is due to the resolution of the records (six figure) and the records correlate with the 2009 surveys and must relate to the adjacent woodland as no habitats occur in the quarry void at the location shown by the data search report.

No protected or notable plants were recorded within the quarry boundary during the habitat survey. Although undertaken outside of the optimum period,

the presence of such species was assessed as being highly unlikely due to the operational nature of the site.

The 2009 survey identified the presence of small cudweed (*Filago minima*) and carline thistle (*Carlina vulgaris*), both of which are locally uncommon species, within the survey area where pioneer vegetation was noted along peripheral quarry rim habitats. It was noted that many of these areas had been subject to natural succession in the intervening period and that they now support more extensive scrub vegetation.

Based on the nature of remaining quarry development and ultimate restoration, protected and notable flora are not taken forward as an important ecological feature in the EcIA.

Invasive Flora

The desk study identified the presence of Japanese knotweed (*Fallopia japonica*) and New Zealand willowherb (*Epilobium brunnescens*) within the site. As with notable plants, the identification of Japanese knotweed and New Zealand willowherb within the quarry void itself by the data search report is considered more likely to represent a discrepancy associated with the record resolution.

Whilst the 2021 survey was undertaken in January, no evidence of invasive plant species was noted within the quarry boundary. The presence of Japanese knotweed was previously identified within the site, albeit beyond the quarry boundary as defined by perimeter palisade fence, which was confirmed in January 2021 (TN 11). This occurrence is considered more likely to be that indicated by the SEWBReC report.

Sixteen invasive non-native plant species have been recorded within the wider search area.

Whilst the identified stand of Japanese knotweed is beyond the working area, its presence is taken forward in the EcIA due to the implications associated with this species being listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).

Bats

The desk study returned 153 records relating to 10 species or species groups of bat, as summarised below:

- Two records of brown long-eared bat (*Plecotus auratus*) have been returned within the 2km search area – in 1984 a roost was recorded 1044m north of the site and in 2013 one individual was recorded 2km south of the site.
- 31 records of common pipistrelle (*Pipistrellus pipistrellus*) were returned between 2007 and 2018. This includes records of four roosts or potential roosts, with the closest being in the Old Arched Bridge, Pontypridd (approx. 1216m south of the site).
- Two records of Daubenton's bat (*Myotis daubentonii*) have been returned from 2009 and 2018. Both records were located in Ynysangharad Park, approximately 1.6km south of the site and include a commuting individual and a potential roost.
- There are five records of commuting and foraging Myotis bats dating between 1986 and 2018. The closest record is 810m east of the site.
- One Nathusius's Pipistrelle (*Pipistrellus nathusii*) record has been returned in relation to a bat commuting along a river in 2018, approximately 1.6km south west of the site.
- Seven records of foraging and commuting Noctule (*Nyctalus noctule*) were returned, dating between 2006 and 2018. The majority of the records were recorded around the Old Arched Bridge and Ynysangharad Park, Pontypridd. The closest record was recorded 761m south east of the site.
- Twenty-two records identified as being pipistrelle species (though not identified to species level) have been recorded between 1984 and 2019, one of which relates to the site from the 2009 surveys. Ten roosts have been recorded within the 2km search are. These include two in Ynysybwl (1.8km north west of Site), one in Coed y Cwm (1.3km north of Site), one in Clydach court (1km north), one in Berwedd dy Cottages (671m north), one in Trallwn (943m south east), and two in Pontypridd (1.5km south west).
- Fifty-four records of soprano pipistrelle (*Pipistrellus pygmaeus*) were returned between 2007 and 2018, the majority recorded in 2011 along the Taff Trail as part of Cardiff Bat Group's Bats and Bikes survey.

One record relates to the site and the 2009 surveys. The records include three confirmed roosts – one in Former Taff Vale Precinct (1.3km from site), one in a tree in Ynysangharad Park (1.6km south), and one in Pontypridd (1.7km south west).

- Twenty-six records of unidentified bats were returned dating between 1982 and 2015. These include nine records of roosts in houses and businesses in Coed y Cwm (1.2km from the Site), Graigwen (1.3km), Pontypridd (1.5km), and Ynysybwl (1.9km).
- Whiskered bats (*Myotis mystacinus*) have been recorded twice in 2011 and 2014. One roost was recorded in a house in Glyn Coch (1km north of the Site).

Surveys of the site in 2009 did not identify any roost sites. It was concluded that the presence of roosts within the active quarry (faces) was unlikely due to the high levels of ongoing mineral extraction at the site. A further bat survey was carried out in 2015 in relation to a face requiring removal. No evidence of roosting was recorded at the time although common pipistrelle bats were recorded foraging around the scrub above the face in question.

Semi-mature and mature trees of a size and age that they may, potentially, offer roosting opportunities for bats occur within the site and surrounding woodland associated with Craig-yr-Hesg/Lan Wood SINC. These will all be retained during the remaining quarry development works. The scrub and immature trees which have established within the operational area are of an age / size that they lack any opportunities for bats.

The majority of quarry faces fall into the following categories. They are in their final worked position, lack cracks or fissures that could be used by bats or are highly disturbed by current mineral extraction and processing operations. The conclusions reached in the 2010 ES are considered to still represent an accurate reflection of the current situation. As such, no further surveys in respect of bat roosts have been undertaken to inform the EcIA and the mitigation measures proposed should continue to be followed as set out in Section 7.5 below.

Activity surveys of the site were undertaken in 2009, these identified relatively low levels of foraging activity by soprano pipistrelle and common pipistrelle.

The operational quarry itself offers negligible foraging opportunities for bats, due to the absence of vegetated habitats that would have associated invertebrate interest and therefore provide foraging opportunities for bats.

The woodland and woodland edge habitats associated with Craig-yr-Hesg/Lan Wood SINC and the undesignated habitats to the north of the quarry void (TN 1) all offer highly suitable bat foraging and commuting habitat although these will all remain undisturbed by quarrying operations.

The conclusions reached in 2010 are considered to be an accurate reflection of the current situation and no further removal of vegetated habitats is required as the quarry void has reached its final extent . As such, no further surveys in respect of bat activity have been undertaken to inform the EcIA.

The site is assessed as being of Local importance for bats although due to their protected status, this group is taken forward as an important ecological feature.

Hazel Dormouse

The data search did not return any records of this species within the 2km search area.

A habitat suitability assessment was undertaken, together with a hazel nut search, during the 2009 surveys which informed the 2010 ROMP. This did not record any evidence of dormouse although it was considered possible that this species could be present where more suitable habitats occur.

The peripheral woodland habitats were considered to have the potential to meet the habitat requirements of hazel dormouse, although with an absence of local records the species may equally be absent.

The peripheral woodland habitats are to be retained during the quarry development and, given that the lateral footprint of the quarry has now been reached, no surveys have been undertaken and hazel dormouse is not taken forward as an important ecological feature in the EcIA.

Badger

The data search returned two records of badger (*Meles meles*) dating to 2015: one was recorded in a location 1.1km north of the site (no description of the record is given) and a disused sett was recorded 1.6km north east of the site.

The 2009 ecological surveys did not identify any badger setts in the survey area at the time, although reference to a potential badger paw print/scratch marks and foraging marks along the south-western area of the quarry void was made.

The quarry has reached its full lateral (and depth) extent and does not contain habitats that are potentially suitable for badgers (e.g. for sett building or foraging). Peripheral woodlands will be retained and any badgers using such habitats would be habituated to the presence of quarrying activity.

As such, no further surveys have been undertaken and badgers are not taken forward as an important ecological feature.

Otter and Water Vole

The data search returned 10 records of otter (*Lutra lutra*), the closest of which was approximately 600m from the site, and no records of water vole (*Arvicola amphibius*).

The presence of these species was discounted during surveys to inform the 2010 ROMP due to an absence of suitable habitat within the site and that remains the case. The only aquatic habitat relates to a wheel wash reservoir (TN 6) which is concrete lined and in operational use. It lacks vegetation or any connectivity with other potential habitats.

As such, surveys for otter and water vole have not been undertaken and these species are not taken forward as important ecological features.

Invertebrates

The desk study returned 239 records relating to 96 species of invertebrate within the search area, including species of conservation concern including small pearl-bordered fritillary (*Bolorai selene*), pearl-bordered fritillary (*Boloria euphrosyne*), brown-banded carder bee (*Bombus (Thoracobombus) humilis*), goat moth (*Cossus cossus*), marsh fritillary (*Euphydryas aurinia*), white-letter hairstreak (*Satyrium w-album*) and grayling (*Hipparchia semele*).

The presence of grayling butterfly and a range of other common and widespread species was identified during the 2009 surveys and some of the notable species records relate to Craig-yr-Hesg/Lan Wood SINC.

The Phase 1 survey found that the operational quarry provides limited opportunities for invertebrates, due to absence of vegetation or flowering plants. The site does not contain any habitats which are of recognised high invertebrate value, such as semi-natural woodland, species rich-grassland or ponds.

The margins of the existing quarry offer increased suitability for invertebrates due to the presence of a more varied vegetation structure which has established on edge protection bunds in combination with areas of bare rock with a range of aspects. This is likely to include, but not limited to, butterflies/moths (Lepidoptera), beetles (Coleoptera), bees/wasps (Hymenoptera) and flies (Diptera). This mosaic also meets the habitat requirements of grayling butterfly which has previously been recorded at the site.

Due to the limited scale of any potential invertebrate habitat within the site which is to be disturbed during the continued operation of the site, and nature of quarry development and restoration that is proposed, no specific surveys for invertebrates have been undertaken to inform the EcIA.

As such, in the context of this EcIA and nature of development proposed, invertebrates are not considered as an important ecological feature in need of specific assessment and are therefore not taken forward in the EcIA as an important ecological feature. Invertebrates are, however, discussed in the context of restoration as several species/assemblages would benefit.

Amphibians

There are no records of great crested newt (*Triturus cristatus*) within the 2km search area identified by the SEWBReC report. The SEWBReC report did

identify the presence of common frog (*Rana temporaria*) and common toad (*Bufo bufo*).

Three palmate newt (*Lissotriton helveticus*) records were returned, dating between 2019 and 2020. Two adults were recorded in a pond in Craig-yr-Hesg wood (212m south). Two individuals were recorded in Lan Woods (583m south).

No specific surveys for amphibians were undertaken during the 2009 surveys which informed the 2010 ROMP, as no suitable breeding habitats were identified.

It remains the case that no suitable aquatic habitats for great crested newt occur within the site, and none were identified in the immediate surrounding area[9]. The only standing water identified within the site relates to the site settlement lagoons located within the plant site area (TN 6), and a quarry sump within the quarry operational area. The settlement lagoons are concrete lined operational lagoons with levels of suspended solids such that they are turbid and no vegetation present. The sump is a transient feature within a disturbed quarry area with no connectivity or suitable adjoining habitat Both are highly operational features that lacks suitability for great crested newt.

As such, no specific surveys for amphibians have been undertaken, as their presence is highly unlikely especially given the lack of great crested newt records within close proximity of the site. The site is also unlikely to be of importance to any other amphibian species on this basis. As such, amphibians are scoped out from further assessment within this EcIA and are not taken forward as an important ecological feature.

Reptiles

The desk study returned a number of reptile records within the search area.

Adder (*Vipera berus*) has been recorded three times between 2007 and 2014, including one record which relates to the site obtained during the 2009 survey work undertaken to inform the 2010 ROMP. The other two records were located at Lady Windsor Spoils (1.5km north of the Site) and St Michaels Primary School, Treforest (2.9km south east).

Thirteen records of common lizard (*Zootoca vivipara*) were returned, dating between 1992 and 2018, including records which relate to the site obtained during the 2009 survey work undertaken to inform the 2010 ROMP. This species has also been recorded in Craig-yr-Hesg wood (212m south) and in Lan Wood (721m south).

Grass snake (*Natrix helvetica*) has been recorded on site in 2009. No other records were returned within the 2km search area.

The data search returned sixteen records of slow worm (*Anguis fragilis*), dating between 1975 and 2016, including records from within the site which relate to 2009 surveys undertaken to inform the 2010 ROMP. This species has also been recorded in Craig yr Hesg wood (212m south) and in a garden in Glyncoch (687m north).

The continued presence of common lizard in the locality was confirmed by SLR in 2018, with one adult and three juvenile lizards observed basking on dry stone walling within the grassland (TN 2).

The majority of the site does not provide opportunities for reptiles due to the absence of vegetation and highly operation status of the quarry. As no further habitat loss is proposed to complete the mineral extraction, and reptiles are already confirmed to be present at the site, a reptile survey has not been undertaken to inform this EcIA.

Due to previous surveys confirming the presence of adder, slow worm, grass snake and common lizard in peripheral habitats, which may be subject to disturbance during final restoration but not extraction activities, the site is evaluated as having Local importance for reptiles and this group is taken forward as an important ecological feature.

[9] Based on a review of 250m buffer using background OS maps.

Birds

The data search returned a total of 482 records for birds relating to 66 species within the 2km search area.

Nesting peregrine falcon (*Falco peregrinus*), a species listed on Schedule 1 of the Wildlife and Countryside Act 1981 (as amended), has been recorded within the site, as identified in the 2010 ROMP. This species has previously been recorded nesting on the southern faces which are in their final worked position.

Other Schedule 1 species recorded within the 2km search area include nine records of kingfisher (*Alcedo atthis*) along the River Taff and in Ynysangharad Park, one record of merlin (*Falco columbarius*) 2km from the site and seven records of red kite (*Milvus milvus*) between 1.3km and 2.3km from the site.

In addition, records of Section 7 species include bullfinch (*Pyrrhula pyrrhula*), cuckoo (*Cuculus canorus*), dunnock (*Prunella modularis*), kestrel (*Falco tinnunculus*), lesser spotted woodpecker (*Dendrocopos minor*), spotted flycatcher (*Muscicapa striata*) and willow tit (*Poecile montana*).

The majority of bird records are correlated with woodland habitats and sites of known nature conservation value, including Craig-yr-Hesg / Lan Wood SINC.

A breeding bird survey of the site was undertaken in 2009 to inform the 2010 ROMP. This recorded the presence of 34 species of which 28 were confirmed or likely breeders. This included the presence of peregrine falcon within the quarry void, although the majority of the bird interest was found to be associated with peripheral woodland and scrub habitats of the existing quarry which remain undisturbed by quarrying activities. The presence of barn owl (*Tyto alba*) was also identified during the 2009 breeding bird survey although no evidence of nesting recorded. A subsequent barn owl survey in 2015 focussed on a quarry face to be removed; but no evidence of barn owl was recorded at the time.

Due to the presence of breeding bird habitat around the site peripheries, and the likely presence of peregrine falcon within the site itself, the bird assemblage is evaluated as being important at the Local level and is taken forward as an important ecological feature for assessment in the EcIA.

7.3.4 Summary of Important Ecological Features

Table 7-4 summarises the important ecological features in need of specific assessment as part of the EcIA.

Table 7-4 Summary of Important Ecological Features

Ecological Feature	Scale at which Feature if Important	Comments on Legal Status and/or Importance
Craig-yr-Hesg/Lan Wood SINC (including restored Ancient Woodland)	County	Non-statutory designation, not formally protected by legislation but planning policy seeks to avoid loss or detrimental impact. Part of SINC is also defined as LWS which although statutory is in relation to public access rather than ecological value.
Taff and Rhondda Rivers SINC	County	Non-statutory designation, not formally protected by legislation but planning policy seeks to avoid loss or detrimental impact.
Restored Ancient Woodland (Within Craig-yr-Hesg SINC)	County	Partially undesignated habitat, but recognised as a priority habitat under Section 7 of the Environment Act.
Japanese knotweed	N/A	Species listed on Schedule 9 of the Wildlife and Countryside Act 1981 (as amended).
Bats	Local	European and UK Protected species. Some species are of higher conservation priority as Annex II species. A number of bat species are recognised as species of principal importance under Section 7 of Environment Act; lesser horseshoe bat is identified in the LBAP.
Reptiles	Local	All native reptiles are UK Protected species and recognised as species of principal importance under Section 7 of the Environment Act. Grass snake, adder and common lizard are also identified as LBAP species.
Birds	Local	All species protected whilst nesting under Wildlife and Countryside Act. Peregrine falcon also protected from disturbance under

Ecological Feature	Scale at which Feature if Important	Comments on Legal Status and/or Importance
		Schedule 1). A number of species are also species of principal importance under Section 7 of the Environment Act or Birds of Conservation Concern in Wales[10].

7.4 Summary Project Description

Full details of the quarry development scheme are set out in Chapter 3 and the accompanying figures within that chapter. A summary is provided below in order to give a context for the EcIA.

The approved quarry development schemes are shown as **Figures 3.5 and 3.6**, it is the same quarry development that this application seeks to permit albeit over a period of an additional six years to that originally envisaged (six years extraction followed by one year for removal of residual stocks). The following key actions of the approved quarry development remain:

- The further establishment of the narrow cutting along the eastern side of the quarry, which would be developed down to the final base level of 100m AOD;
- The establishment / relocation of the dust / fine aggregate tip in the southern area of the quarry;
- The development of the quarry faces and benches westwards with intermediate benches shown at the 165m, 150,m 140m, and 130m AOD levels, and a sinking down to 115m and the final base level of 100m AOD (with a limited area of sinking below 100m AOD which would act as a quarry sump for surface water drainage).
- At this stage, quarrying would be completed above the 150m AOD level, with future quarrying associated with working the lower benches back to their final positions below this level.

The Final Quarry Development Plan is shown on plan ref CYH6 (produced as **Figure 3.4**). This is consistent with the approved final quarry layout shown on plan ref SR 05 (**Figure 3.6**), subject to some very minor inconsequential changes to face positions.

The final restoration scheme then entails the creation of;

- Quarry face restoration – retention of faces and crags with selective restoration blasting an option to provide scree and integration with the outcrops present at Craig-yr-Hesg/Lan Wood SINC;
- Quarry bench restoration including for restoration treatments to provide a variation from bare rock for natural succession to the use of quarry waste materials to enable planting; and
- Quarry floor restoration inclusion a nurse sward to aid stabilisation of restoration materials whilst natural succession occurs.

7.5 Assessment of Effects and Mitigation Measures

This section describes the predicted effects and proposed mitigation measures for the extension to operations at the site for an additional seven years, focusing on the important ecological features identified in Table 7-4.

Potential impacts relate to direct effects that are typically associated with the operational phase i.e. habitat loss to enable restoration activities, whereas indirect impacts encompass adverse effects such as alterations to hydrology, introduction of artificial lighting etc that may occur during operational and post-

[10] Johnstone, I. and Bladwell, S. (2016) *Birds of Conservation Concern in Wales 3: the population status of birds in Wales*. RSPB, Bangor.

operational stages. Consideration to both stages is given in the following assessment as applicable to the identified ecological feature.

It is noted PPW11 sets out (paragraph 5.14.47) that '*Extensions to existing mineral working, whether they be time, lateral or depth extensions should be considered in the same manner as applications for new sites*'. This is recognised through the completion of an EcIA as part of the Section 73 application. However, as a general 'high level' ecological consideration, the use of an existing 'Site' typically has lower overall impact than if the development were being proposed on a new greenfield site which would require new infrastructure i.e. access, services and hardstanding etc, and potentially result in greater land take than continuing operations at existing sites.

Mineral extraction at the site is long standing, with the quarry established at the end of the 19th Century. The potential impacts associated with the existing quarry operations have been assessed and accepted as part the site's 2010 ROMP (Environment Act Initial Review of planning conditions) which was approved in April 2013. Since this period, quarry development has progressed as approved and it is important to note that this EcIA relates to the extension to timescale for the permitted quarry development and that no additional impacts to those already approved would occur.

7.5.1 Craig-yr-Hesg/Lan Wood SINC (including restored Ancient Woodland)

Potential Impacts

The potential impacts relate to alterations in habitat composition or quality through changes in the hydrological regime or dust deposition.

A Hydrological Impact Assessment (HIA) was undertaken to inform the 2010 ROMP application and 2015 Western Extension Application. The HIA, and associated EcIA's, did not predict any significant effects upon the Craig-yr-Hesg/Lan Wood SINC as a result of either proposal on the basis that quarrying operations were well progressed and robust environmental protection measures (i.e water management and dust suppression) were also in place and well-established.

The quarry void is already at its maximum extent in terms of lateral and depth limits. Whilst some relatively minor progression of faces would take place during the proposed time extension, this relates to faces on the distal side of the quarry to Craig-yr-Hesg SINC. This, together, with the fact that operations occur above the water table, make any indirect effects upon the hydrological regime of Craig-yr-Hesg SINC highly unlikely.

Similarly, the Air Quality Assessment highlights that operations within the existing quarry void are highly unlikely to result in any significant effects, as the existing dust suppression and control measures (in accordance with the current planning permission (condition 30) will be followed.

As such, the continuation of quarrying for an additional six years is not predicted to have any negative effect on Craig-yr-Hesg/Lan Wood SINC.

Proposed Mitigation Measures

The proposed nature-conservation based restoration of the site, as set out in Chapter 4, includes woodland creation and natural regeneration to enable the colonisation of species of local provenance to complement not only Craig-yr-Hesg/Lan Wood SINC but the wider network of locally designated sites.

Based on the findings of the HIA and AQA, together with the fact that no direct loss of SINC designated land would occur, no specific mitigation is proposed or deemed to be required as a result of the continuance of quarrying for a further six years.

Significance of Residual Effects

No significant residual effects upon Craig-yr-Hesg/Lan Wood SINC are predicted. The restoration scheme would complement the SINC and result in a positive gain for biodiversity at a local and potentially greater level i.e. RCT.

7.5.2 Taff and Rhondda Rivers SINC

Potential Impacts

The potential impacts relate to alterations in habitat composition or quality through changes in the hydrological regime as a result of discharges from the site.

As set out above, the site is long established with existing water management with the majority of surface water being attenuated by the quarry void itself, before soaking away to the underlying water table. Site discharges are managed and permitted by Natural Resources Wales via a consent issued in 1993 (Consent Number AF4029101).

The HIA's undertaken to inform the 2010 ROMP and 2015 Western Extension application did not identify any likelihood of significant effects upon the Taff and so the continuation of this activity for five years is not predicted to result in any significant effects upon the Taff and Rhondda Rivers SINC as existing control measures would remain in use.

Proposed Mitigation Measures

Based on the findings of the HIA, no specific mitigation is proposed or deemed to be required.

Significance of Residual Effects

No significant residual effects upon the Taff and Rhondda Rivers SINC are predicted.

7.5.3 Site Habitats

Potential Impacts

The completion of the permitted quarry development will not result in the loss of any additional habitats to the existing permission, as the quarry has reached its full lateral and depth extents with only working of certain benches required to reach final restoration positions. As a result, no habitat fragmentation effects are predicted as no retained habitats would be severed.

Some minor disturbance of vegetation at the periphery may be required to complete restoration, especially where this has established on bunding adjacent to internal roads etc.

Any disturbance of these habitats will take place as part of the restoration process regardless of a quarrying time extension, the timescale for this occurring would now be extended by six years.

The presence of Japanese knotweed has also been identified within the site boundary but beyond the site perimeter fence. As such, the continued operation of the site and implementation of restoration works are unlikely to cause the spread of this species (which would represent an offence under the Wildlife and Countryside Act and negatively affect the integrity of site restoration). Even if there was the potential to cause this species to spread, that risk would occur under the permitted quarry development. If anything, a delay of six years enables the implementation of a control programme to reduce the risk of future restoration works causing the spread of this species or it colonising the restored habitats.

Proposed Mitigation Measures

Full details of the proposed habitat creation/regeneration and aftercare are set out in Chapter 4.0 and shown on Drawing CYH7. Overall, the aim will be to create a sheltered valley (with grassland, scrub and woodland) to extend and compliment the semi-natural broadleaved woodland habitats found locally including Craig-yr-Hesg Local Nature Reserve (LNR) immediately to the south of the site, and Craig-yr-Hesg / Lan Wood Site of Importance for Nature Conservation (SINC).

In summary, the following restoration is proposed:

- Quarry Bench Restoration – predominantly as natural regeneration to encourage establishment of locally occurring species from the adjacent Craig-yr-Hesg woodland. In more visually prominent locations, soiling and planting of quarry benches will occur as specified in Chapter 4; and

- Quarry Floor Restoration – following removal of quarry infrastructure, the quarry floor will be reprofiled where required and a mosaic of bare ground, seasonal inundation and species-rich grassland will be created.

Whilst the risk of the continued operation causing the spread of Japanese knotweed is considered to the very low, an invasive plant species control programme will also be implemented as set out in the EMP.

Significance of Residual Effects

The continued operation will result in a delay of seven years in terms of delivering restoration habitats.

The provision of restoration habitats under the permitted quarry development timescale is purely a function of when this would occur following cessation of quarrying. Restoration habitats are not required to address specific habitat or species compensation requirements that have been committed to as part of previous applications. As such, a delay of six years does not conflict with earlier ecological mitigation/compensation requirements.

As set out above, the final site restoration devotes the site to habitat creation to complement the local network of SINC designated sites and includes habitats of recognised conservation priority and which, over time, could be of high value to a range of protected and notable species known to occur locally, in particular within Craig-yr-Hesg/Lan Wood SINC.

No significant negative impacts are predicted, and the residual situation is assessed as being positive at the local, potentially County, level due to an increase in priority habitats including woodland and calcareous grassland.

7.5.4 Bats

Potential Impacts

In the absence of mitigation, there is the potential for direct impacts via loss/damage of a bat roost(s) and accidental killing/injury of roosting bat(s) within the quarry faces, during any ongoing quarrying activities directly affecting the quarry faces (such as blasting/drilling).

There is also the potential for indirect effects on roosting bats via noise disturbance and light disturbance although such infrastructure is already in place/quarrying processes underway such that no impacts are predicted as no changes to the baseline would occur.

As the quarry void has reached its full lateral extent, there are no potential impacts in relation to loss of foraging habitat or alteration/severance of commuting routes.

Proposed Mitigation Measures

The 2010 ROMP ES set out that" *Prior inspection of any large crevices in undisturbed areas of the quarry faces will be carried out to check for possible bat presences immediately ahead of quarrying works, and a suitable written protocol will be implemented to ensure that any bats which are found are dealt with in accordance with current legislation and best practice*."

This approach was accepted and the requirement transposed into Condition 42 of the ROMP schedule of conditions which requires the submission of a Wildlife Protection Plan which would address this and other issues. This was duly submitted but not approved at the time and it was agreed that further consideration would be held in abeyance pending the determination of the western extension application. The current time extension application provides an opportunity to re-visit the requirements for a Wildlife Protection Plan, which is now embraced by an EMP accompanying this ES. As such it is proposed to continue with the approach set out in the 2010 ROMP during the additional six years of quarry development, the faces this relates to and the measures to be adopted are encompassed by the EMP submitted as **Appendix 7.3**.

In the event of a roost being confirmed at a later date, the potential requirement for a European Protected Species Licence (EPSL) will be reviewed.

Taking the nature of the site restoration into accounts, even if a roost is confirmed in the future, no specific roost provision is likely to be proposed.

This is due to both the operational site and final restoration encompassing significant areas of quarry face habitat that will provide comparable opportunities in perpetuity. Furthermore, it must be noted that establishment of any roost would only be possible as a result of mineral extraction processes creating quarry faces in the first instance. As such, any future roost would be of recent creation and highly unlikely to form any component of current or favourable conservation status of the species concerned.

An EPSL would only be sought where any future inspection confirms both the presence of a roost site and an unavoidable impact which may destroy the roost or risk killing or injury of bats.

If required, the EPSL would contain provision of roost exclusion measures to avoid killing or injuring bats.

The permitted restoration includes habitats to be created/regenerated that will be of greater value to bats than the current situation. Restoration and habitat creation will provide habitats within the site that are suitable for foraging and commuting bats, including species-rich grassland, woodland and scrub mosaics. This is still proposed and is provided as part of general site restoration, not to address any specific mitigation need for bat foraging habitats (as per the 2010 ROMP conclusions) and this remains the case.

Significance of Residual Effects

There are no significant residual effects to bats predicted. The time extension to enable completion of the permitted quarry development, and associated delay in implementing restoration, is not considered likely to significantly affect bats as the delivery of the site restoration under the current permission was not required to deliver bat foraging or commuting habitats in a given timescale. The site restoration still offers significant gains for bats in the longer term.

7.5.5 Reptiles

Potential Impacts

The quarry has already reached its full working extent and so there are no potential impacts to reptile habitats arising from operational activities. There may be localised disturbance of peripheral habitats known to be used by reptiles during the implementation of restoration works. This would occur under the permitted development regardless of the time extension being required and, in contrast, delaying by six years may actually decrease the likelihood of reptile presence as a result of further ecological succession to scrub (as observed since the 2009 surveys).

In the absence of mitigation, removal of vegetated bunds at the periphery would have the potential to kill or injure reptiles present when removal takes place. The loss of habitats would also decrease foraging habitat, which could potentially affect the population size as a result of reduced prey sources although this is highly unlikely to be significant in the context of the extensive areas of known reptile habitats to be retained. As such, the local assemblage of reptiles would be able to maintain itself at comparable levels regardless of the timing of restoration works.

Should any killing or injury occur, such an impact would be significant for any reptiles present, however this would be highly unlikely to be significant for the wider reptile assemblage due to the fact only small areas of habitat would be affected.

Proposed Mitigation Measures

The commonly occurring reptile species (that are confirmed as being present) are protected under Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in respect of part of sub-section 9(1) and all of sub-section 9(5) only. As such, it is an offence to intentionally kill, injure or trade these species. These species are also identified as conservation priorities under Section 7 of the Environment Act.

The 2010 ROMP application set out the following approach to reptile mitigation:

- The limited remaining areas considered to have an elevated risk of supporting common reptiles would be cleared outside of the reptile hibernation period (i.e. not between November to March inclusive) and would be subject to pre-clearance inspection and destructive searching where considered necessary by the supervising ecologist;

- Common reptiles which are encountered during works would be allowed to leave the immediate works area unharmed, and if necessary assisted by means of capture and release; and
- Dense ruderal and grassland vegetation would be strimmed and raked away at least 24 hours ahead of earthmoving, so as to reduce the attractiveness of the areas to be worked for reptiles and thus encourage them to leave the area; and

A Wildlife Protection Plan was required by ROMP condition 42. As set out above, this was duly submitted but not approved at the time. The current time extension application provides an opportunity to re-visit the requirements for a Wildlife Protection Plan, which is now embraced by an EMP accompanying this ES.

As such, reptile protection measures above are considered to remain valid and are now proposed with further details provided in the EMP.

Significance of Residual Effects

Following adoption of reptile protection measures, the risk of killing/injuring reptiles would be as low as possible in any situation. Whilst there will be some localised temporary loss of habitat to enable final restoration, this would occur under the current permitted development regardless of the time extension application. Site restoration will provide significant long-term gains for reptiles. As such, no significant effects are predicted and in the long term, following restoration, a positive effect is predicted.

7.5.6 Breeding Birds

Potential Impacts

The potential impacts to breeding birds relate to direct impacts i.e. whilst nesting, and indirect impacts i.e. loss of foraging habitat reducing population fitness or displacement of breeding territories.

There is the potential for damage/destruction to active bird nests during the removal of any peripheral vegetation to enable final restoration works. There is also the potential to disturb or destroy active bird nests within quarry faces, either directly if the faces are being directly worked on or indirectly through noise and activity disturbance.

However, any breeding birds present in a given year will have commenced nesting activity in the context of an operational quarry site and are likely to be habituated to the activities associated with the current operations of the quarry. Therefore, no significant impact in terms of noise/vibration disturbance is predicted for breeding birds.

Peregrine falcon has also been recorded breeding at the site in the past, nesting on a southern face which would not be directly impacted during the continued quarry operations. Given the presence of this species within an active quarry which has been present for over 100 years, the continuation of activities for a further six years is unlikely to significantly affect peregrine falcon.

Proposed Mitigation Measures

The nests of wild birds, regardless of how common the species are, are protected under the Wildlife and Countryside Act 1981 (as amended) whilst they are occupied or being built. Peregrine falcon also receives a higher level of protection through Schedule 1 of the Wildlife and Countryside Act 1981 (as amended) (i.e. protection from disturbance during breeding).

The 2010 ROMP application proposed the following mitigation in respect of breeding birds:

- *The site will be monitored annually by site operators for peregrine falcon and care would be taken in the nesting season (approximately March to June) to reduce or limit noise and other disruptive activity, as far as possible, in the vicinity of any nest; and*
- *Clearance of trees and scrub would avoid the main bird nesting season (March to August inclusive), to minimise the risk of accidental destruction or disturbance of nests, eggs and nestlings.*

The specific measures are considered to remain appropriate and will be implemented as set out in the EMP.

The creation of species-rich grassland, scrub and woodland mosaics during final restoration scheme will provide significant habitat gains for birds, including retention of suitable faces for nesting peregrine falcon. The provision of these habitats was not required to address any specific impacts identified by the 2010 ROMP and so a delay of five years is not considered to be significant, not least as the faces utilised by peregrine falcon (the species of greatest conservation priority at the site) are already present.

Significance of Residual Effects

No significant residual effects on birds are predicted as a result of the continuation of quarrying for a further six for five years and the associated delay of completing restoration.

7.5.7 Cumulative Effects

As the quarry has already reached its permitted lateral and depth extents, there is no additional development proposed or required. This EcIA relates to the continuation of the approved quarry development for a further six years and subsequent restoration following existing approved plans. Existing environmental control measures are in place, particularly in terms of dust and water management, and this will remain the case with no change to the current baseline situation.

The EcIA, HIA and AQA to not predict any impact pathways to offsite receptors.

As such, no significant cumulative effects with other known or potential developments are considered likely to occur.

7.5.8 Proposed Compensation Measures

The 2010 ROMP ES set out details of specific mitigation measures to be followed in order to complete the quarry development. No additional compensatory measures were deemed to be required, or requested, at the time and this is considered to remain the case.

7.5.9 Proposed Enhancement Measures

The 2010 ROMP application did not set out any specific enhancement measures beyond those delivered through site restoration. In recognition of advances in planning policy in the intervening time, it is now proposed to also make further enhancements during the operational period as follows:

- Erection of 20 bat and 20 bird boxes (including one barn owl box) in retained woodland habitats;
- Implementation of Japanese knotweed control programme; and
- Creation of five artificial hibernacula features suitable for reptiles during final restoration.

7.5.10 Proposed Monitoring

The proposed monitoring for the site is detailed in the Ecological Management Plan provided as **Appendix 7.3**.

7.6 Summary of Effects

A summary of potential impacts, proposed mitigation, and residual effects is provided for each important ecological feature included in the assessment in Table 7-5. Table 7-5 also includes a summary of proposed biodiversity enhancements which, when compared to the current situation, meets the requirements of PPW to avoid significant loss of habitat and provide a net benefit for biodiversity.

Table 7-5 Summary of Potential Impacts, Mitigation, Residual Impacts and Enhancements

Ecological Feature	Potential Impact	Proposed Mitigation and Enhancement	Means of Delivering Mitigation	Residual Effects
Craig-yr-Hesg/Lan Wood SINC	Potential significant impacts discounted.	N/A	N/A	No significant negative residual effect predicted.
Taff and Rhondda Rivers SINC	Potential significant impacts discounted.	N/A	N/A	No significant negative residual effect predicted.
Undesignated site habitats	No significant impacts are predicted as only minor and localised vegetation removal may be required to implement restoration.	Full site restoration including natural regeneration of quarry benches and habitat creation (species-rich grassland and scrub/broadleaved woodland) on selected benches and the quarry floor.	Via restoration scheme and Ecological Management Plan, which can be secured by planning condition.	No significant negative residual effect predicted.
Bats	Potential loss/damage/disturbance to roost(s) and inadvertent killing/injury of roosting bat(s) if present within the quarry faces.	Undertake update roost detection surveys as identified in EMP; exclude roosting bat(s) if present under licence prior to works directly affecting the quarry face. Habitat creation undertaken as per the restoration scheme to provide foraging and commuting habitat (woodland, scrub and species-rich grassland)	Via restoration scheme and Ecological Management Plan, which can be secured by planning condition. Where relevant, EPSL obligations.	No significant negative residual effect predicted.
Reptiles (adder, common lizard, grass snake and slow worm)	Potential killing or injury during vegetation removal to enable final restoration and associated small-scale temporary loss of habitat.	Implementation of habitat manipulation and avoidance measures including destructive searching.	Via restoration scheme and Ecological Management Plan, which can be secured by planning condition.	No significant negative residual effect predicted.
Breeding bird assemblage (including peregrine falcon)	Localised loss of nesting and foraging habitat to enable restoration; potential damage/destruction of active nests during vegetation removal; potential disturbance of peregrine falcon whilst nesting).	Avoidance of vegetation removal within the nesting season; avoid disturbance to nesting peregrine falcon. New habitats provided during restoration.	Via restoration scheme and Ecological Management Plan, which can be secured by planning condition.	No significant negative residual effect predicted.

7.7 Summary and Conclusions

SLR Consulting Limited was instructed to undertake an EcIA to provide technical input into an Environmental Statement in respect of a Section 73 application at Craig-yr-Hesg Quarry. The application is being made to permit the continuation of quarrying for a further six years.

An assessment of the significance of predicted ecological impacts that would result has been undertaken following current CIEEM guidance.

The EcIA draws upon a range of surveys undertaken in 2009 to inform an earlier ROMP application, upon which the current ROMP schedule of planning conditions is based (issued April 2013).

To review this, habitat surveys (using Phase 1 habitat classification methodology) and assessment for the potential of protected and notable species were undertaken in January and February 2021 by an experienced ecologist from SLR.

As the quarry has now reached its final lateral and depth extents, with only relatively minor working of existing faces required to complete the approved quarry development, no further surveys have been deemed necessary.

The baseline situation, in terms of habitats, remains as reported in the 2010 ROMP. There have been minor losses of peripheral habitat in the intervening period to achieve the quarry void extent, together with a degree of natural ecological succession resulting in increased scrub growth.

As a result, the conclusions reached during the 2010 ROMP application, determined in April 2013, are considered to remain valid and no additional impacts are predicted, or mitigation measures proposed.

In summary, the conclusions reached/measures previously agreed and considered valid are:

- No direct or indirect potential significant impacts have been identified upon any identified statutory or non-statutory designated sites for nature conservation. Craig-yr-Hesg / Lan Wood SINC occurs partially within the application site boundary but is beyond the working area and would be complemented by the nature conservation-based site restoration.

- The presence of notable habitats i.e. those identified as priorities under Section 7 of the Environment Act and the LBAP, has been identified in peripheral areas (including the identified SINC) (i.e. broadleaved woodland), although no losses would occur and no significant residual impacts are predicted.

- The potential presence of roosting bats has been identified although the occurrence of such is considered unlikely. However the 2010 ROMP ES set out an approach to review quarry faces during quarry development works. As some face progression would take place, this is considered to remain appropriate and has been included in the EMP.

- Common reptile species (adder, common lizard, grass snake and slow worm) have been confirmed, again this relates to peripheral areas that may be subject to minor disturbance during final restoration. An approach to reptile mitigation was set out in the 2010 ROMP which is considered to remain appropriate and is included in the EMP.

- Peregrine falcon and a range of other breeding bird species occur, this predominantly relates to presence in peripheral habitats that will be retained or subject to minor disturbance during final restoration. Working protocols set out in the 2010 ROMP with regard to peregrine falcon are considered to remain valid and is included in the EMP.

The proposed restoration reflects that approved as part of the 2013 ROMP determination. This will deliver significant habitat gains of biodiversity value for a range of species. The delivery of this restoration was not required to address any specified predicted impact to habitats or species and so a delay of seven years is not considered significant or in need of any additional ecological / biodiversity compensation etc.

Overall, it is concluded that the continuation of quarrying for a further six years can be undertaken with full compliance with nature conservation policies at local and national level and would not result in any significant negative residual impact. Delivery of the restoration scheme will represent a positive impact.

8.0 HYDROLOGY AND HYDROGEOLOGY

8.1 Introduction

A hydrogeological impact assessment was undertaken by ESI Ltd (now Stantec Ltd) as part of the 2010 ES, which comprised an assessment of the hydrological and hydrogeological effects of quarrying within the existing permitted area of Craig yr Hesg Quarry. The assessment was updated as part of the 2015 ES to take into account the effects of quarrying within the proposed western extension area, in conjunction with the ongoing development within the existing quarry area.

The findings of the studies are straightforward, with the key issues being:

(i) The regional groundwater level, as measured in groundwater monitoring boreholes and experienced in the quarry void lies below the maximum base level of the quarry at 100m AOD. Quarrying to such depths has not and will not intercept groundwater.

(ii) Seepage from perched groundwater enters the void, together with direct rainfall and surface water runoff from the immediately adjoining area. This is directed by drainage channels within the quarry void into a sump at the base of the void, from where the water freely seeps into the underlying sandstone and migrates downwards to the underlying regional water table.

(iii) Surface water within the processing plant / office complex area is dealt with by an existing system of settlement lagoons and an off-site discharge regulated by NRW by a consent issued in 2013 (consent no AF4029101).

(iv) Minor spring flows feeding the Nant Tai'r-heol at Cefn and Darren-Ddu streams in the vicinity of the quarry are the only potential surface water receptors that have been identified as being at potential risk of impact from the quarry operations. However, the risk of impact is considered to be low, and any minor impact is likely to already have occurred historically as the quarry base is already well below the elevation of the springs feeding the streams.

(v) The key issue requiring mitigation measures is the potential for suspended sediment or fuel spillage to affect groundwater and surface water quality, for which standard mitigation measures are required and are in place.

These findings and recommendations are reflected in the ROMP schedule of conditions which require that:

- No excavation or extraction of minerals shall take place below 100m AOD other than those works necessary for the construction of the quarry sump (ref condition 6);
- Specific measures are to be in place for the storage of oils, fuels and chemicals to ensure no accidental leakage (ref condition 35);
- Any ditch, stream water course or culvert passing through the site are to be safeguarded to ensure that drainage onto or from adjoining land is not impaired or rendered less effective (ref condition 36);
- Settlement ponds at the site are to be kept in good order, and no discharge is permitted of waste, oil or other pollutant to any settlement pond, ditch, stream, watercourse or other culvert (condition 37); and
- No excavation shall take place below the depth of the water table until a Hydrogeological Impact Appraisal for dewatering and a scheme of working has been submitted to and approved in writing by the Local Planning Authority (ref condition 38): this is a contingency condition which it is not considered will become relevant since no excavation below the water table is anticipated.

The above conditions were deemed by RCT to be sufficient to regulate the hydrological and hydrogeological issues which were identified in the 2010 ES

and given that there are not proposed to be any changes to the working scheme or existing drainage arrangements, these measures are considered to be appropriate to adequately safeguard ground and surface water interests for the requested extended duration of the development.

In that context, it is noted that the Planning Officer's Reports to the RCT Planning Committee which determined the western extension application (February and July 2020) were accompanied by a schedule of planning conditions linked to the recommendation that planning permission be granted. That schedule mirrored the existing ROMP conditions relating to the depth of quarrying, storage of fuel oil, safeguarding of existing watercourses, and maintenance of settlement ponds. These conditions were thus deemed appropriate as part of a western extension development if it had been permitted and it is thus reasonable to conclude that the existing ROMP conditions remain appropriate for the requested extended duration of operations associated with the Section 73 application.

8.2 Additional Hydrological Issues

The 2015 ES made a number of additional observations in relation to ground and surface water protection, and future drainage. The issues of relevance to the existing quarry are set out below, drawn from the 2015 ES, and serve to inform the good management measures in place at the quarry:

8.2.1 Suspended Solids

Sediment suspended in site runoff is a common contaminant produced from the extractive industry. Suspended solids are a particular hazard to aquatic fauna by clogging fish gills, destroying spawning sites and restricting plant growth. Increased entrained sediment in streams also increases the erosive capacity and can also exacerbate flooding.

Quality and rate of discharge from the site is controlled by the on-site attenuation and settlement system and regulated by the existing discharge consent to the River Taf (Consent Number AF4029101). To date, due diligence has ensured that the quality of surface water leaving the site has not been of concern. This is not expected to change for the requested extended duration of the development subject to continued management and attention. It should also be noted that the water which is discharged originates from the processing plant area and not the quarry workings, and thus there will be no changes to the existing arrangements during the extended time period.

8.2.2 Hydrocarbon Contamination

Leakage of fuel oil and / or solvents from plant machinery, vehicles or storage tanks could locally lead to surface water contamination through interception by runoff and subsequent discharge to surface watercourses, and groundwater contamination through infiltration and migration to the local water table. Groundwater contamination may pose a risk to water resources where groundwater abstractions are present and also surface waters, if they derive baseflow from the aquifer underlying the contaminated area.

The current and future extraction is characterised by the use of automated machinery and processing within custom built structures. Fuel is stored in appropriately constructed and maintained tanks within bunded areas. Oil interception screens are employed where possible in order to reduce hydrocarbon contamination in site runoff water prior to discharge. Site machinery and vehicles are appropriately maintained within site workshops to prevent or quickly identify and repair leaks. The good practice as to the management of hydrocarbons will continue in all operational areas.

With the mitigation incorporated in the existing and proposed operation (as described above) the potential ongoing impact to surface water and groundwater quality is considered to be negligible.

8.2.3 Quarry void drainage

Run-off into the main excavation will be allowed to continue soaking into the base of the quarry and does not represent a flood risk outside the site. The performance of the current soakage area indicates that this could accommodate most flows. However, in the event that short-term flows are too high, then the quarry floor would be allowed to flood temporarily. This water would be removed subsequently through ongoing soakage to ground.

In this context, the 2015 ES noted that the soakage capacity of the main excavation needs to be maintained to ensure efficient operation of the quarry. In order to achieve this, a number of specific recommendations were made in the surface water and drainage assessment produced as Appendix 9.3 to the 2015 ES. Several of these were predicated on development into the western extension area which is not relevant to this ES. However, the most straightforward recommendation was to ensure that the existing soakage area is retained and that the continued efficiency of the soakaway is encouraged by installing a drainage blanket (which has already been done).

8.3 Conclusions

The ground and surface water controls at Craig yr Hesg Quarry are straightforward and are well-established. No changes are proposed to the approved quarry development scheme to which the conditions apply, and there would thus be no changes which would necessitate a review of the existing ground and surface water management controls.

The conditions imposed as part of the initial period ROMP review are thus considered to be adequate to continue to control ground and surface water for the requested extended time period.

9.0 NOISE

9.1 Introduction

A study of the noise effects associated with the continuation of quarrying and related operations at Craig yr Hesg Quarry has been undertaken by The Walker Beak Mason Partnership (WBM).

Craig yr Hesg Quarry is a long-established quarry and located on the western side of the Taff Valley, some 1km north of the built-up area of Pontypridd and to the south of the village of Glyncoch. The quarry has reached its full lateral limits. An application is to be submitted to the Planning Authority, Rhondda Cynon Taff (RCT), which will seek permission to continue quarrying operations for a 6 year period beyond December 2022.

WBM was approached by Hanson in November 2020 to provide a noise assessment in connection with the proposed time extension. WBM has had previous involvement with Craig yr Hesg Quarry, including routine site noise monitoring undertaken in 2013-2017 and professional advice on noise in connection with input to an EIA for the proposed western extension in 2014-2015.

The noise chapter provides sufficient information to demonstrate how the noise levels arising from the quarry operations have been satisfactorily controlled and monitored and that this effective control will apply for the proposed longer time period. This assessment considers the noise impact at the four properties listed in the conditions relating to noise set out in the ROMP Review of Planning Conditions for Craig-Yr-Hesg Quarry, ref: 08/1380/10 dated 24.04.2013.

The chapter provides the calculated noise levels arising from the workings and considers the possibility of the need for any mitigation measures where necessary to enable the site to conform with acceptable noise level criteria at dwellings having regard to current advice from the Welsh Government.

The suggested noise limits conform with limits imposed by existing planning conditions at dwellings and the noise source data for the calculated site noise levels are based on measurements at this quarry and experience of many sites and operating quarries.

In order to appreciate some of the terms used in this chapter **Appendix 9.1** (ES Volume 2) describes the noise units that are referred to.

9.2 Assessment Methodology

The relevant noise guidance documents referred to for this assessment are detailed below.

9.2.1 Technical Advice Note (Wales) 11 (TAN11)

The primary planning guidance on noise is contained in Planning Guidance (Wales) Technical Advice Note (Wales) 11 Noise dated October 1997.

Technical Advice Note 11 (TAN11) does not refer specifically to noise from surface mineral workings. However, following extensive consultation and research, the Department of the Environment and The Welsh Office prepared guidelines on noise from mineral workings for Planning Authorities and Minerals Operators. The advice was contained in Minerals Planning Guidance Note 11 (MPG11) dated April 1993 which, in England, was superseded by Minerals Planning Statement 2 (MPS2) "*Controlling and Mitigating the Environmental Effects of Mineral Extraction*" Annex 2: Noise, dated March 2005. MPS2 was cancelled for England by the National Planning Policy Framework (NPPF) in March 2012 and current noise guidance in Planning Practice Guidance (Minerals) applies in England, but not Wales. Parts of MPG11 remain extant in Wales, as discussed below.

There is a Welsh Government Consultation Document with date of issue: 10 February 2020 and responses required by 4 May 2020 "*Call for Evidence: Review to Technical Advice Note 11 Noise, to incorporate Air Quality and Soundscape*". However, the Consultation Document for TAN11 is not relevant for this assessment.

9.2.2 Minerals Technical Advice Note 1 (MTAN1)

Minerals Technical Advice Note (Wales) 1: Aggregates (MTAN1) issued by the Welsh Assembly Government in March 2004 includes paragraphs 85 to

88 headed “Noise”. MTAN1 supersedes paragraphs 31 to 42 of MPG11, but the noise limits closely follow the advice contained in MPG11.

Paragraph 88 of MTAN1 relates to noise limits and states:

“***Noise limits*** *– noise limits should relate to background noise levels[54], subject to a maximum daytime noise limit of 55 dB(A) where background noise levels exceed 45 dB(A). 55dB(A) is the lower limit of daytime noise levels where serious annoyance is caused. Where background noise is less than 45 dB(A), noise limits should be defined as background noise levels plus 10 dB(A). Night-time working limits should not exceed 42 dB(A) at noise sensitive properties. Daytime working is defined as 0700-1900 hours and night-time as 1900-0700 hours. Noise limits should be set in terms of $L_{Aeq,T}$ over a 1-hour measuring period. $L_{Aeq,}$ is the noise index used to describe the “average” level of noise that varies with time (T) and should be measured “free-field” that is, at least 3.5 metres away from a façade to prevent reflection of noise by any façade that faces the noise source. During temporary and short-term operations higher levels may be reasonable but should not exceed 67dB(A) for periods of up to 8 weeks in a year at specified noise sensitive properties.*

[54]Background noise is normally measured as LA90,T or the noise level exceeded for 90% of the specified measurement period (T).”

9.2.3 Minerals Planning Guidance Note 11 (MPG11)

The Department of the Environment and The Welsh Office prepared guidelines on noise from mineral workings for Mineral Planning Authorities (MPAs) and Minerals Operators. This advice was contained in Minerals Planning Guidance Note 11 "The Control of Noise at Surface Mineral Workings" dated April 1993. As noted above, this guidance has since been replaced in England by MPS 2 which was then superseded by the National Planning Policy Framework and Planning Practice Guidance (Minerals).

MTAN1 superseded paragraphs 31 to 42 of MPG11, but the remainder of MPG11 is still applicable in Wales

The aim of the guidelines, as set out in paragraph 1 of MPG 11, “*is to provide advice on how the planning system can be used to keep noise emissions from surface mineral workings within environmentally acceptable limits without imposing unreasonable burdens on minerals operators*."

9.2.4 Mineral Planning Authority

Craig yr Hesg Quarry falls within the jurisdiction of Rhondda Cynon Taf County Borough Council.

Following an Environment Act 1995 ROMP Review of Planning Conditions, new conditions were applied to Craig-yr-Hesg Quarry by decision ref: 08/1380/10, dated 24.04.2013. Condition numbers 18 to 22 relate to noise limits and noise monitoring and the wording of those conditions is reproduced below.

Condition 18 states:

> “*Between the hours of 07:00 and 19:00 the free field Equivalent Continuous Noise Level LAeq,T due to operations within the site shall not exceed the relevant noise limit specified in Table 1 below at each selected noise sensitive property. Measurements taken to verify compliance shall have regard to the effects of extraneous noise and shall be corrected for any such effects.”*
>
> *Table 1*

Receptor	*No 36 Conway Close*	*No 3 Pen y Bryn*	*Flat above shop Garth Avenue*	*No 1 Rogart Terrace*
Criteria	*49 dB LAeq,1hr*	*47 dB LAeq,1hr*	*54 dB LAeq,1hr*	*55 dB LAeq,1hr*

Condition 19 states:

> “*Between the hours of 19:00 and 07:00 the free field Equivalent Continuous Noise Level $L_{Aeq,T}$ due to operations in the site shall not exceed 42 dB $L_{Aeq,1hr}$ at each selected noise sensitive property specified in Table 1 above*.”

Condition 20 states:

> "*Noise levels attributable to operations of a temporary nature on the periphery of the site such as the formation, removal or alteration of spoil tips, screening and storage embankments, measured at any noise sensitive property specified in Table 1 above , shall not exceed a level of 67dB LAeq,1hr (free field) These noise limits shall only apply for a maximum of 8 weeks in any calendar year.*"

Condition 21 states:

> "*Noise monitoring shall be undertaken at the properties listed in Table 1 or other representative properties biannually for the first 2 years from the date of the decision notice, then annually for the following three years. Thereafter, the frequency of monitoring shall be agreed with the LPA. The results of monitoring shall be submitted to the LPA, together with confirmation of action taken to remedy any breach of the limits set out in Table 1.*"

Condition 22 states:

> "*Within three months of the date of this permission a noise management scheme for the site shall be submitted to and approved in writing by the LPA, which shall, if practicable, include the provision of measures to reduce noise levels from site operations including the provision of any perimeter bunds/barriers, and specify the locations and methodology for monitoring carried out as required by condition 21 above. All site operations and noise monitoring shall be carried out in accordance with the approved scheme, unless otherwise approved in writing by the LPA*".

With regard to Condition 22, WBM prepared a noise monitoring scheme for Hanson UK dated October 2013. This scheme, replicated in **Appendix 9.2**, was approved by Rhondda Cynon Taf County Borough Council in November 2014.

9.3 Site Description

Craig yr Hesg quarry is situated on the western side of the Taff Valley, some 1km north of the built-up area of Pontypridd. The village of Glyncoch lies beyond the northern boundary of the quarry. Locally, the quarry is bounded to the north by the Glyncoch football ground and clubhouse; to the northwest by open agricultural land; to the west and southwest by the prominent wooded ridgeline of Coed Craig yr Hesg, which overlooks the town of Pontypridd; and to the east by a narrow corridor of woodland between the site and the B4273 Ynysybwl Road. The A470 dual carriageway is situated east of the B4273 and east of the River Taff.

The quarry processing plant items are located at the east end of the site with active stone extraction occurring towards the west of the site.

A general plan showing the outline of the quarry and the adjacent housing in included in **Appendix 9.2**.

A plan of the processing plant area is provided in **Appendix 9.3**.

9.4 Existing Noise Levels

9.4.1 Routine Noise Monitoring 2013-2017

Routine noise monitoring has been undertaken by WBM during the daytime in April 2013, November 2013, July 2014, December 2014, June 2015, June 2016 and July 2017.

All monitoring occurred during normal daytime quarry operations at the receptor locations agreed with Rhondda Cynon Taf County Borough Council.

The locations are presented in **Appendix 9.2** and summarised below in Table 9-1.

Table 9-1 Summary of Routine Noise Monitoring Results

Location	Receptor identified in ROMP Condition 18	Specific location used for noise monitoring
Conway Close	No 36 Conway Close	By pavement and low wall south of No.23 Conway Close
Pen y Bryn	No 3 Pen y Bryn	By break in fence at edge of road, west of No. 5 Pen y Bryn
Garth Avenue	Flat above shop Garth Avenue	Edge of grass bank above shop, end of roadway east of No. 113 Garth Avenue
Rogart Terrace	No 1 Rogart Terrace	On path by site access road, west of 1 Rogart Terrace, about 5 metres to HGV movements on site access road

Extracts from the WBM monitoring reports, presenting the noise survey data, summary of noise levels and the report conclusions are set out in **Appendix 9.4**.

The overall measured noise levels or the estimated site noise levels were below the site noise limits for routine operations for all four locations. A summary of the measured levels and site noise estimates obtained at the agreed receptors locations is presented below in Table 9-2.

Table 9-2 Summary of Routine Noise Monitoring Results 2013-2017

Location	Measured Noise dB $L_{Aeq,15min}$	Estimated Site Noise dB $L_{Aeq,T}$	Site Noise Limit dB $L_{Aeq,1h}$
Conway Close	37-51	Site generally inaudible	49
Pen y Bryn	36-46	Site generally inaudible	47
Garth Avenue	49-57	≤53	54
Rogart Terrace	55-67	≤54	55

For Conway Close, site activities were inaudible for the majority of noise monitoring surveys. There was one survey (November 2013) with an estimate of site activity noise, however this was below 44 dB $L_{Aeq,T}$ and below the site noise limit of 49 dB $L_{Aeq,1h}$ at this location.

For Pen y Bryn, site activities were inaudible for the majority of noise monitoring surveys. There have been two surveys (November 2013 and June 2016) where an estimate of site activity noise was noted, however these were below 41 dB $L_{Aeq,T}$ and below the site noise limit of 47 dB $L_{Aeq,1h}$ at this location.

Garth Avenue is nearest to the primary crusher and site activity noise is audible at this location. However the estimated site noise levels were at or below 53 dB $L_{Aeq,T}$ and therefore below the site noise limit of 54 dB $L_{Aeq,1h}$ for this location. Other noise sources audible at this location include road traffic.

Rogart Terrace is adjacent to the site access road. Site activity noise is audible at this location due to plant and vehicles. However the estimated site noise levels were at or below 54 dB $L_{Aeq,T}$ and therefore below the site noise limit of 55 dB $L_{Aeq,1h}$ for this location.

In summary, all of the site noise monitoring surveys have demonstrated compliance with the current noise limits.

Background noise levels were also measured during the routine noise monitoring surveys in 2013-2017.

Site activities were inaudible for the majority of noise monitoring surveys at Conway Close and Pen y Bryn, and were not significant with regard to the background noise levels. The average background levels at these noise monitoring locations were 40 dB $L_{A90,T}$ at Conway Close and 36 dB $L_{A90,T}$ at Pen y Bryn.

For Garth Avenue and Rogart Terrace, site activities were audible and contributed to the measured background noise levels.

9.4.2 Noise Measurements December 2020

Noise measurements during normal daytime quarry operations were undertaken in December 2020. These included measurements at the receptor locations and in the vicinity of plant items on site.

The survey details are presented in **Appendix 9.5**. The results and observations from the receptor locations are presented in **Appendix 9.6**. The results and observations from the on-site plant noise measurements are presented in **Appendix 9.7**

Noise Levels at Receptor Locations

Noise measurements at the four receptor locations were undertaken during daytime hours on Tuesday 08 and Wednesday 09 December 2020. The detailed results and observations are set out in **Appendix 9.6**. A summary of the results is presented in Table 9-3.

Table 9-3 Summary of Noise Measurement Results December 2020

Location	Measured Noise dB $L_{Aeq,15min}$	Estimated Site Noise dB $L_{Aeq,T}$	Site Noise Limit dB $L_{Aeq,1h}$
Conway Close	41-47	Site inaudible	49
Pen y Bryn	40-54	<39 or otherwise inaudible	47
Garth Avenue	51-57	≤53	54
Rogart Terrace	57-59	≤54	55

Site activities were generally inaudible at Conway Close and Pen y Bryn.

At Conway close, the most significant noise source was distant and local road traffic.

There was one instance where activities that could be attributed to the site were audible at Pen y Bryn but these were below 39 dB $L_{Aeq,T}$ and below the site noise limit of 47 dB at this location. One of the measurements at Pen y Bryn was higher than other results at this location (54 dB $L_{Aeq,15min}$) however this was due to extraneous noise from local activities. The noise sources noted at this location included distant road traffic and local activity.

The estimated site noise at Garth Avenue and Rogart Terrace are similar to the values noted for the previous routine noise monitoring and are below the site noise limits for these locations.

Site activity noise is generally audible at Garth Avenue. Other noise sources audible at this location include road traffic; this was particularly significant during a measurement undertaken during the morning peak traffic period on 09 December 2020.

Rogart Terrace is adjacent to the site access road but is also adjacent to the B4273 Ynysybwl Road; road traffic from Ynysybwl Road is the dominant noise source at this location. Site activity noise is audible at this location due to plant and vehicles.

The surveys undertaken in December 2020 have also demonstrated compliance with the current noise limits.

The range of background noise levels obtained during the December 2020 surveys were:

- 40-45 dB $L_{A90,T}$ at Conway Close;
- 35-36 dB $L_{A90,T}$ at Pen y Bryn;
- 48-55 dB $L_{A90,T}$ at Garth Avenue; and
- 53-56 dB $L_{A90,T}$ at Rogart Terrace.

For the measurements at Conway Close and Pen y Bryn, site operations were generally inaudible and were not significant with regard to the background noise levels

The background noise measurements at Garth Avenue and Rogart Terrace included some contributions from site activity.

Noise Levels from Quarry Plant

Noise measurements were undertaken in the vicinity of the operating quarry plant in December 2020 to determine the output levels of the most significant plant items. The detailed results and observations are set out in **Appendix 9.7**; these have been used in the calculations to determine the noise impact at the receptor locations.

9.4.3 Additional Noise Measurements March 2021

Additional noise measurements were undertaken in March 2021. These included two sample measurements at the noise monitoring locations at Pen y Bryn and Garth Avenue during daytime hours but at a time when site operations had ceased. This was to allow noise measurements to be obtained at these locations without any contribution from site activities.

Noise monitoring also took place at the rear of 26 Conway Close. A sound level meter was installed for unattended measurements between about 15:00 on Thursday 04 March 2021 and 17:00 on Tuesday 09 March 2021, with consecutive 15-minute data obtained over that period. Three attended sample measurements of 15-minute duration were also made at this location when the sound level meter was installed and collected, so that observations could be made about the sources of noise contributing to the measured noise levels.

The survey details are presented in **Appendix 9.5**. The results of all measurements, and observations from the attended sample measurements, are presented in **Appendix 9.6**.

The range of background noise levels obtained during the March 2021 surveys were:

- 30-47 dB $L_{A90,T}$ at 26 Conway Close (installed meter and samples)
- 34-35 dB $L_{A90,T}$ at Pen y Bryn; and
- 44-46 dB $L_{A90,T}$ at Garth Avenue.

For 26 Conway Close, the average daytime background noise level is 37 dB $L_{A90,T}$ for all measured values obtained in March 2021 at the install location, for the permitted (& proposed) hours of operation.

9.4.4 Summary of Background Noise Levels

The noise limits for Craig yr Hesg Quarry set out in Condition 18 of the ROMP Review of Planning Conditions were determined from baseline background noise levels measured by Entec in 2009. The baseline noise levels were obtained over a weekend period when little or no quarry operations were being undertaken.

The reported average background results in the ROMP noise assessment chapter are as follows:

Table 9-4 ROMP Baseline Background Values 2009

Location	Average Background Levels dB $L_{A90,T}$
36 Conway Close	39.0
3 Pen y Bryn	36.4
Garth Avenue – flat above local shop	43.8
1 Rogart Terrace	52.5

For the noise measurements undertaken by WBM at Conway Close in 2013-2017, 2020 and 2021, site activities were predominantly inaudible both at the noise monitoring location and also at the rear of no. 26. The measured background noise levels can be considered representative of baseline conditions without any contribution from the quarry. The recent installed sound level meter at 26 Conway Close in March 2021 has an average background level of 37 dB $L_{A90,T}$.

For the noise monitoring location at Pen y Bryn, the noise measurements undertaken by WBM in 2013-2017 and 2020 were undertaken with the quarry operational although site activities were mostly inaudible. The measured background noise levels from these surveys can be considered representative of baseline conditions without any contribution from the quarry. The additional measurements in March 2021 were undertaken without quarry activity, with background levels in the range 34-35 dB $L_{A90,T}$. These results are similar to baseline values obtained in 2009 (overall average of 36 dB $L_{A90,T}$).

In the event that the quarry ceases operations in December 2022 (as currently required), then beyond that date the baseline background noise levels would be similar to the values measured at Conway Close and Pen y Bryn in the respective surveys.

For Garth Avenue, the noise measurements in 2013-2017 and in 2020 were undertaken with the quarry operational. Site activities were audible at the monitoring location and affected the measured levels. The additional measurements in March 2021 were undertaken without quarry activity. The results of the March 2021 measurements are similar to the baseline values obtained in 2009.

For Rogart Terrace, the noise measurements in 2013-2017 and 2020 were all undertaken with quarry operational and site activities affected the measured levels. However, the noise levels at this location were also affected by traffic on the B4273 (Ynysybwl Road) with road traffic being the dominant noise source. The 2009 baseline background levels at this location were around 53 dB $L_{A90,T}$.

9.5 Suggested Site Noise limits

9.5.1 Daytime

MTAN 1 states "… *noise limits should relate to background noise levels, subject to a maximum daytime noise limit of 55 dB(A) where background noise levels exceed 45 dB(A). 55dB(A) is the lower limit of daytime noise levels where serious annoyance is caused. Where background noise is less than 45 dB(A), noise limits should be defined as background noise levels plus 10 dB(A).*"

The noise assessment has considered if the current operation and the requested 6 year extension to the operation can continue within these limits at the receptor locations considered.

The current daytime noise limits were set out in Condition 18 of the ROMP schedule, as presented in Section 9.2.4 of this noise chapter. The noise limits were based on the background noise survey results obtained in July 2009 during periods when there was little or no site activity. These background results are presented in Section 9.4.4.

At Conway Close, the current noise limit is 49 dB $L_{Aeq,1h}$ determined from the baseline background levels obtained in 2009, which had an average of value 39.0 dB $L_{A90,T}$. In the 2015 ES for the proposed western quarry extension, the presented average background level for Conway Close was 36 dB $L_{A90,T}$ with a suggested site noise limit of 46 dB $L_{Aeq,1h}$. The results of the installed meter at 26 Conway Close in March 2021 indicate that the average background level was 37 dB $L_{A90,T}$. To reflect the more recent measured value and for consistency with the limit recommended with respect to the western extension development, it is proposed that a lower noise limit of 46 dB $L_{Aeq,1h}$ be adopted for this location.

The current noise limit for Pen y Bryn is 47 dB $L_{Aeq,1h}$. The noise measurements undertaken at this location, with and without the quarry operating, have resulted in similar background levels to those determined in 2009, on which the current noise limits are based. No changes are proposed to the noise limit at this location.

The current noise limit for Garth Avenue is 54 dB $L_{Aeq,1h}$. The recent measurements in March 2021 undertaken without quarry operations resulted in similar background levels to those determined in 2009, on which the current noise limits are based. No changes are proposed to the noise limit at this location.

The current noise limit for Rogart Terrace is 55 dB $L_{Aeq,1h}$. The baseline background noise levels at this location are over 45 dB $L_{A90,T}$, therefore the current limit remains valid.

Therefore it is proposed that the Condition 18 daytime noise level criteria are carried forward for Pen y Bryn, Garth Avenue and Rogart Terrace. A reduced noise limit of 46 dB $L_{Aeq,1h}$ is proposed for Conway Close. The suggested noise limits are tabulated below.

Table 9-5 Suggested Daytime Noise Limits

Location	Suggested Daytime Noise Limit dB $L_{Aeq,1h}$
Conway Close	46
Pen y Bryn	47
Garth Avenue	54
Rogart Terrace	55

The noise assessment has confirmed that the existing operations are proceeding in accordance with the current noise limits, and also with the reduced noise limit proposed for Conway Close.

The limits are considered to be appropriate for the requested extended 6 year time extension.

9.5.2 Night-time

MTAN 1 states *"Night-time working limits should not exceed 42 dB(A) at noise sensitive properties."* with night-time defined as 19:00 to 07:00 hours. This limit is set out in Condition 19. It is understood there are no site operations that occur at these times. However, should operations occur during the night period then this noise limit as set out in Condition 19 should continue to apply to the site.

9.5.3 Temporary Operations

MTAN 1 states "*During temporary and short-term operations higher levels may be reasonable but should not exceed 67dB(A) for periods of up to 8 weeks in a year at specified noise sensitive properties."*

This limit is included in Condition 20, which refers to *"…operations of a temporary nature on the periphery of the site such as the formation, removal or alteration of spoil tips, screening and storage embankments*."

The small soil storage bunds about the site have already been formed, but they would be removed as part of the restoration works on the site. It is suggested that the temporary operation noise limit as set out in Condition 20 should continue to apply to the site to cover these operations.

9.6 Calculated Noise Levels

The noise output from the proposed site operations and noise levels received at off-site receptors depends on the method of working and the plant chosen to work the site as much as on the distance to the neighbouring properties and the effects of intervening landform.

Proper allowance can be made for noise attenuation with distance from the various noise sources and for the effects of ground absorption or screening due to topography, the existing quarry edges, barriers, buildings and perimeter bunds.

In order to calculate the noise levels for the proposed site operations, the contribution from each significant specific noise source has been evaluated separately and then combined together to give the overall noise level.

The calculations in this chapter are based on the methods contained in BS5228-1: 2009 "*Code of practice for noise and vibration control on construction and open sites – Part 1: Noise*" + A1: 2014, Annex F.

Further details of the calculation methods are set out in **Appendix 9.8** to this chapter. A summary site noise calculation sheet for one of the dwellings considered is included in **Appendix 9.8**.

For the purposes of examining a reasonable worst case, the various site activities have been assumed to take place at the closest and highest practical position of the proposed extraction and processing operations to each dwelling.

It has also been assumed that all plant items work 100% of one hour for the daytime assessment period at these locations to reflect the worse case scenario.

9.6.1 Noise Sources and Sound Power Levels

Noise measurements were undertaken on the operating quarry site in December 2020 and the results presented in **Appendix 9.7**. There are multiple sources that contribute to the overall noise output from the site. The calculation has considered the most significant noise items as observed on site.

The layout of the processing plant area is provided in **Appendix 9.3**. Within this area the most significant noise sources include:

- Asphalt Plant – this has noise sources at both lower level (estimated 6m above local ground) and higher level (estimated 25m above local ground)
- Screen House – with the main noise source estimated to be 20m above local ground level
- Crusher House – with the main noise source estimated to be 25m above local ground level
- Primary Crusher – the feed for this is located at a higher ground level compared to the processing plant area. The noise source is estimated to be 2m above this higher ground level. The measured levels include material delivery, unloading and crushing, obtained at the side facing the nearest housing.
- Vehicle Movements – including loading shovels moving material and HGVs

Other sources elsewhere on the quarry include the rock drill, excavator for material loading, secondary breaker and vehicle movements (dump trucks).

The plant items used in the calculations are listed in Table 9.4 below along with the Sound Power Level dB L_{WA} (noise output) values. The noise source values for the calculated site noise levels are based on measured levels obtained by WBM on site or from similar plant items, with experience of many sites and operating quarries.

Table 9-6 Plant Items and Sound Power Levels

Plant Item	Data Source	Apparent Sound Power Level dB L_{WA}
Processing Plant Area		
Asphalt Plant (lower level)	Measured on site	109
Asphalt Plant (higher level)	Measured on site	105
Screen House	Measured on site	114
Crusher House	Measured on site	109
Primary Crusher feed (including material loading and crushing)	Measured on site	102
Loading shovels around plant site	WBM plant noise database	108
HGVS on access road and around plant site	WBM plant noise database	104
Quarry		
Dump trucks hauling stone from face	WBM plant noise database	112
Excavator loading blasted stone into dump trucks	Measured on site	108
Rock drill at rock head (on top of working bench)	WBM plant noise database	116
Secondary breaker	Measured on site	118

9.6.2 Quarry Operational Assumptions

The items listed in Table 9-4 are assumed to operate 100% of the time during the daytime period (07:00 and 19:00 hours).

Within the quarry area, the rock drill is used to form the holes for the explosives for blasting. For the purposes of this assessment this activity is assumed to occur for 100% of the time, though in reality the period of operation will be much less. Extraction is complete on the top bench of the quarry and work is now occurring on the second and lower benches. It is assumed that the rock drill would be used simultaneously with other plant around the quarry.

An excavator is used to load blasted stone into dump trucks. The excavator also tips over-sized stone to the base of the quarry for the secondary breaker. It is assumed that the excavator operates continuously with dump trucks moving between the excavator and the primary crusher, with one load every 15 minutes (4 loads per hour).

The rock drill would be located at the highest working point with the excavator and dump trucks on the next bench down, assumed to be 10m lower. The maximum height of the rock drill has been confirmed by Hanson as up to 183m AoD but working at this height would only occur in limited areas.

The secondary breaker is a tracked excavator with a pecker (hammer), located at the lowest point of the quarry. It is assumed to operate for 100% of the time.

With regard to the number of vehicles on the access road, a review of weighbridge movements on what were considered to be “busy” days showed that there were up to 17 HGV movements over a 1 hour period.

During the noise measurements undertaken at Rogart Terrace in December 2020 there were up to 5 vehicles on the site access road over a 15 minute period, which is the equivalent of 20 vehicles over a 1 hour period.

In order to consider a reasonable worst case, the noise assessment has assumed 20 HGV movements on the access road over a 1 hour period, based

on the observations of vehicle movements during the December 2020 noise survey.

9.6.3 Embedded Mitigation

There is screening attenuation provided by a 1.5-2m barrier located between the site access road and Rogart Terrace. As extraction is complete on the top bench of the quarry, the top edge of the quarry will provide screening attenuation.

In addition, the existing landforms around the site provide some screening from quarry operations to the nearest dwellings.

This existing screening attenuation from the various bunds, landforms, barrier and quarry edge have been included in the noise calculation model.

9.6.4 Calculated Site Noise Levels

For the purposes of the calculations, the receiver height has been set as 1.5m for the receiver locations for daytime operations.

The nearest noise sensitive properties to the quarry for which site noise calculations have been made are those set out in the ROMP conditions.

The calculated site noise levels for daytime operations at the set out are out in Table 9-5.

Table 9-7 Calculated Site Noise Levels

Location	Calculated Site Noise Level dB $L_{Aeq,1}$	Suggested Noise Limit dB $L_{Aeq,1h}$
Conway Close	41	46
Pen y Bryn	43	47
Garth Avenue	54	54
Rogart Terrace	53	55

For Conway Close and Pen y Bryn, the most significant noise source is the rock drill.

For Garth Avenue, the most significant noise source is the primary crusher.

For Rogart Terrace, the most significant noise source is HGVs on the access road.

In each case, the calculated site noise levels at the dwellings comply with the suggested noise limits.

9.6.5 Temporary Operations

Soil stripping and bund formation are already completed at the site. There is to be no bund removal in the area of the site nearest to Garth Avenue in the vicinity of the primary crusher.

There is a soil storage bund to the north of the site located approximately 200m from the nearest housing on Pen y Bryn and 250m from Conway Close. Removal of the bund is likely to include an excavator to move the material and a dump truck to transport the material to elsewhere on site.

The levels due to temporary operations have been calculated for the nearest two receptors, assuming that there is no intervening screening attenuation. The calculation does include some attenuation due to soft ground.

Table 9-8 Calculated Site Noise Levels: Temporary Operations

Location	Calculated Site Noise Level dB $L_{Aeq,1}$	Suggested Noise Limit dB $L_{Aeq,1h}$
Conway Close	50	67
Pen y Bryn	52	67

The noise levels due to temporary operations at the nearest housing are well below the suggested noise limit of 67 dB $L_{Aeq,1h}$.

The other receptors (Garth Avenue and Rogart Terrace) are at greater distances and will have some intervening screening from existing landforms.

9.7 Mitigation Measures

Craig yr Hesg Quarry is a fully established quarry that has reached its full lateral limits. There is already embedded mitigation at the site in the form of bunds and a barrier. One of the most significant noise sources for some receptors is the rock drill. As extraction is complete on the top bench of the quarry, work is occurring on lower benches, which will result in the edge of the quarry providing screening attenuation. The screening from the edge of the quarry has been included in the noise assessment calculations.

In addition the existing landforms around the site have the potential to provide screening attenuation.

The calculated noise levels have shown that with the existing embedded mitigation measures, current operations meet the suggested noise limits during the day. Noise from temporary operations also meets the suggested noise limit.

No additional mitigation measures are required for this site.

9.8 Recommendations

It is recommended that the ROMP condition noise limits remain in place for three of the four receptor locations (Pen y Bryn, Garth Avenue and Rogart Terrace). A lower daytime noise limit is suggested for Conway Close.

9.9 Summary and Conclusions

Craig yr Hesg Quarry is a fully established quarry that has reached its full lateral limits. The primary focus of the application and associated environmental assessment is with a continuation of operations for a longer time period.

This noise chapter provides sufficient information to demonstrate that the noise levels arising from the quarry operations have been and will continued to be satisfactorily controlled. Monitoring has showed that the noise limits have been achieved at the receptor locations. This effective control will apply for the proposed longer time period.

The chapter provides the calculated noise levels arising from the workings and demonstrates compliance with acceptable noise level criteria at all dwellings.

The sound power levels for the calculated site noise levels are based on noise measurements of plant used on site and experience of many sites and operating quarries.

The reasonable worst case calculated site noise levels at the dwellings comply with the suggested noise limits for the daytime period 0700 to 1900 hours. The calculated noise levels from temporary operations also comply with appropriate noise limits for such activities.

As measured and calculated site noise levels at the receptor locations are within the suggested noise limits with the existing embedded mitigation in place, no additional mitigation measures are considered necessary.

10.0 BLAST VIBRATION

10.1 Introduction

This chapter of the ES considers the effects of ground and airborne vibration which will result from blasting operations as a continuation of current blasting practice in the existing Craig yr Hesg Quarry. It reviews published guidance and standards for blast induced vibration, and the existing planning controls and limits on vibration set for the existing quarry, and assesses the ability to continue to comply with such limits by reference to experience of basting at the quarry and the blast vibration monitoring results which are available.

In summary, blast vibration limits have been imposed as planning conditions at Craig yr Hesg Quarry via the ROMP Review, where the conditions reflect up to date guidance and standards set out in Welsh Government Guidance (ref MTAN1). Whilst blasting will on occasions be noticeable to members of the public (as is the case at all quarries), the limits have been recommended by Welsh Government are set at levels which ensure that there can be no damage to residential type property, and where the effects are deemed by Welsh Government to be acceptable in amenity terms.

All blasts at Craig yr Hesg Quarry are designed by external specialist contractors under the guidance of Hanson to ensure that the limits are not exceeded. All blast are monitored to check the success of the blast design in securing compliance with the limits. The blast monitoring results are made available to RCT and confirm that ground vibration from blasting events are being carried out in compliance with the defined ground vibration limits, with the majority of recordings well below the defined limits.

No changes are proposed to the current limits or to the current blasting practices. It follows that for the requested extended duration of quarrying at the site, blasting would continue to be regulated by the existing limits, and with all blasts continuing to be monitored. With a continuation of attention to blast design, there is no reason why blasting cannot continue to take place in accordance with the existing limits.

This chapter thus recommends that the existing blast vibration limits are continued for the requested extended duration of the operations, and that all blasts continue to be monitored in accordance with the current arrangements, and with the conventional 'good practice' methodologies designed to minimise the effects of blast vibration.

This chapter sets out the standards and guidance relied upon, it describes the blasting process, the blast vibration monitoring scheme which is in place, the 'good practice' mitigation measures which are implemented, and the recommendations for a continuation of this well-established regime.

10.2 Standards and Guidance

Minerals Technical Advice Note (Wales) 1: Aggregates.

Minerals Technical Advice Note (Wales) 1: Aggregates (MTAN1) provides the latest advice on planning controls and good practice methods for minerals extraction sites in Wales. It also provides guidance on keeping blast induced vibrations from mineral extraction sites to acceptable levels, including advice on peak particle velocity (ppv) limits associated with blast vibration at mineral developments.

The guidance suggests that operators should take all reasonable steps through the use of BATNEEC (best available techniques not entailing excessive cost) to minimise blast induced vibrations and maintain the highest possible environmental standards.

In paragraph 83 of the guidance, MTAN1 states:

> *"maximum level of ground vibration at vibration sensitive locations: ground vibration as a result of blasting operations should not exceed a peak particle velocity of 6 mms-1 ppv in 95% of all blasts measured over any 6 month period, and no individual blast should exceed a peak particle velocity of 10 mms-1 ppv;."*

British Standard 6472-2:2008

British Standard 6472:2008 *Guide to evaluation of human exposure to vibration in buildings* Part 2: *Blast-induced vibration* gives guidance on human exposure to blast-induced vibration in buildings and is primarily applicable to blasting operations associated with mineral extraction.

BS6472-2:2008 advises on the maximum satisfactory magnitudes of vibration for residential properties. As blasting at Craig yr Hesg Quarry is only be undertaken during the daytime period, where Table 10.1 taken from BS6472-2:2008 details those maximum satisfactory magnitudes for the daytime period.

Table 10-1 Maximum satisfactory magnitudes of vibration with respect to human response for up to three blast vibration events per day

Place	Time	Satisfactory magnitude [A] ppv mms^{-1}
Residential	**Daytime** 08:00 to 18:00 hrs Monday to Friday 08:00 to 13:00 hrs Saturday	6.0 to 10.0
Offices [B]	Any time	14.0
Workshops [B]	Any time	14.0

[A] The satisfactory magnitudes are the same for the working day and the rest day unless otherwise stated;
[B] Critical working areas where delicate tasks impose more stringent criteria than human comfort are outside the scope of this standard.

As the British Standard is concerned with human response within the buildings, the external levels are set so as to achieve satisfactory internal levels.

BS6472-2:2008 details a method of predicting vibration at nearby vibration-sensitive receptors from previously measured blasting events such as test blasts or historical blasting data gathered as part of a blast vibration monitoring scheme.

British Standard 7385-2:1993

BS7385-2:1993 *Evaluation and Measurement for Vibration in Buildings: Guide to Damage Levels from Groundborne Vibration* gives guidance on the levels of vibration above which building structures could be damaged. It identifies the factors which influence the vibration response of buildings and describes the basic procedure for carrying out measurements. Vibrations of both transient and continuous character are also considered.

The standard has been developed from an extensive review of UK data, relevant national and international documents and other published data. Although a large number of case histories were assembled in the UK database, very few cases of vibration-induced damage were found. It was therefore necessary to refer to the results of experimental investigations carried out in other countries into vibration-induced damage thresholds.

BS7385 gives guide values to prevent cosmetic damage to property. Between 4 Hz and 15 Hz, a guide value of 15 - 20 mm/s is recommended, whist above 40 Hz the guide value is 50 mm/s. Notwithstanding this, the standard also comments "*Minor damage is possible at vibration magnitudes which are greater than twice those given in Table 11.2, and major damage to a building structure may occur at values greater than four times the tabulated values.*"

Table 11.2 from BS7385 is reproduced below as Table 10.2 to the ES.

Table 10-2 Transient Vibration Guide Values for Cosmetic Damage

Line	Type of Building	Peak component particle velocity in frequency range of predominant pulse	
		4 Hz to 15 Hz	15 Hz and above
1	*Reinforced or framed structures. Industrial and heavy commercial buildings*	50 mms^{-1} at 4 Hz and above	50 mms^{-1} at 4 Hz and above
2	*Unreinforced or light framed structures Residential or light commercial type buildings*	15 mms^{-1} at 4 Hz increasing to 20 mms^{-1} at 15 Hz	20 mms^{-1} at 15 Hz increasing to 50 mms^{-1} at 40 Hz and above
Note 1 - Values referred to are at the base of the building. Note 2 - for line 2, at frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded			

From Table 10.2, line 2 for a residential building, a ppv of greater than 15 mms^{-1} at 4 Hz , greater than 20mms-1 at 15Hz or greater than 50 mms^{-1} at 40 Hz or above, measured at the base of the building, could give rise to cosmetic damage.

10.3 Current Planning Conditions

Conditions 23-27 of the ROMP schedule of planning conditions reflect the above guidance and confirm the following:

Condition 23

Blasting shall be undertaken in such a manner to ensure that ground vibration, measured as a maximum of three mutually perpendicular directions taken at the ground surface, does not exceed a peak particle velocity (PPV) of 6mms^{-1} per second in 95% of all blasts measured over any continuous six month period, and no single blast shall exceed a PPV of 10mms^{-1} per second. The measurement is to be taken at or near the foundations of any vibration sensitive building in the vicinity of the quarry existing at the date of this consent.

***Reason**: To limit ground vibration from blasting operations so as to protect the amenities of local residents and the structure of buildings in accordance with Policies CS10 and AW10 of the Rhonda Cynon Taf Local Development Plan.*

Condition 24

Blasting shall be designed in such a manner that air overpressure resulting from any blast does not exceed 120 dB at any residential property.

***Reason**: To limit air overpressure from blasting operations so as to protect the amenities of local residents and the structure of buildings in accordance with Policies CS10 and AW10 of the Rhonda Cynon Taf Local Development Plan.*

Condition 25

Each individual blast shall be monitored in accordance with a Blast Monitoring Scheme to be submitted to the Local Planning Authority within 3 months of the date of this consent. That scheme shall include provision for the recording of details which shall include the location of the monitoring station (to be provided at a minimum of one of the properties listed at Para 10.3.1 of the Environmental Statement, or such other location previously agreed in writing with the Local Planning Authority); the position of the blast holes; weather conditions; the specification of the blast in terms of MIC, PPV data and total charge weight, and provision for the results to be made available immediately to the Local Planning Authority on request. All monitoring shall be undertaken

in accordance with the terms of the approved scheme for the duration of the mining operations at the site.

***Reason**: To ensure adequate monitoring of blasting operations in the interests of the amenities of local residents in accordance with Policies CS10 and AW10 of the Rhonda Cynon Taf Local Development Plan.*

Condition 26

Blasting times shall be clearly advertised at the Quarry and a warning, audible at the site boundary, shall be sounded prior to any blasting operations taking place, and shall be sounded again immediately after blasting has finished.

***Reason**: To give reasonable warning of blasting operations in the interests of public safety and the amenities of local residents in accordance with Policies CS10 and AW10 of the Rhonda Cynon Taf Local Development Plan.*

Condition 27

There shall be no secondary breakage of stone by the use of explosives.

***Reason**: To limit blasting operations so as to protect the amenities of local residents in accordance with Policies CS10 and AW10 of the Rhonda Cynon Taf Local Development Plan.*

Condition 25 requires the submission of a Blast Monitoring Scheme. This was duly submitted in February 2017 with a request for the scheme to be approved, but no response was received from RCT. An updated scheme was submitted in July 2018 with a suggested minor revision to add an additional monitoring location at No 24 Garth Avenue which is a location where blast vibration monitoring has traditionally been carried out, and for consistency with the noise monitoring locations proposed as part of a separate noise monitoring scheme (discussed in ES Chapter 9.0 above). A copy of the Blast Monitoring Scheme is produced as **Appendix 10.1** with the data base schedule referred to.

The scheme remains undetermined by RCT, but the measures set out in the scheme are being implemented by Hanson, as evident from the blast monitoring results set out in section 10.5 below.

10.4 Effects of Blasting

10.4.1 Ground Vibration

The purpose of quarry blasting is to fracture the rock and pile it up on the quarry floor to enable it to be loaded for transport to the processing plant. It is important to understand that for any given blast it is very much in the operator's interest to always reduce vibration, both ground and airborne, to the minimum possible. This is because a well-designed, and carefully executed blast with the optimum weight of correctly placed explosive will result in maximum benefit to the operator with minimum effect on neighbours.

There is considerable practical and theoretical research that has been undertaken into the damage potential of blast induced ground vibration including research undertaken by Vibrock Limited (ref *The Environmental Effects of Production Blasting from Surface Mineral Workings, Vibrock. Published by the Stationery Office 1998*).

A typical blast consists of a number of boreholes into which are placed explosive charges. Each borehole is detonated individually by the use of a series of detonators each with differing millisecond delays. The detonation of explosives within a confined borehole generates stress (seismic) waves causing localised vibration, distortion or cracking. This type of ground vibration is always generated, even by the most well-designed blasts, and will radiate away from the blast source, attenuating as distance increases.

Research has concluded that the maximum value of particle velocity in any stress wave is the parameter of significance and is generally termed peak particle velocity (ppv), measured in millimetres per second (mms).

With experience and knowledge of the factors which influence ground vibration, such as blast type and design, site geology and receiving structure,

the magnitude and significance of the blast induced waves can be accurately predicted at any location.

In general terms, a person will become aware of blast-induced vibration at levels of around 1.5mms^{-1} ppv although under some circumstances this can be as low as 0.5mms^{-1} ppv. However, humans are very poor at determining relative magnitudes of vibration, for example, the difference between 4.0mms-1 ppv and 6.0mms^{-1} ppv is unlikely to be perceived by a person.

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

Table 10.3 gives examples of vibration levels routinely generated in a property.

Table 10-3 Vibration Levels Generated by 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

With regard to physical damage to properties, extensive research has been carried out around the world, the most prominent being undertaken by the United States Bureau of Mines (USBM). Damage to a structure could occur if the dynamic stresses induced in a structure by vibration exceed the allowable design stress for the specific building material. Classifications of building damage range from very fine plaster cracking up to major cracking of structural elements. In particular, when defining damage to buildings, the following classifications are used:

- Cosmetic or threshold – the formation of hairline cracks or the growth of existing cracks in plaster, dry wall surfaces or mortar joints.
- Minor – the formation of large cracks or loosening or falling of plaster on dry wall surfaces, or cracks through bricks/concrete blocks.
- Major or structural – damage to structural elements of the building.

Studies by the USBM concluded that vibration levels in excess of 50mms^{-1} ppv are required to cause structural damage. The onset of cosmetic damage can be associated with lower vibration levels. Vibration levels between 19mms^{-1} ppv and 50mms^{-1} ppv for open pit blasting are generally considered safe in the UK. It should be noted that these limits are for the worst-case structure conditions and that they are independent of the number of blasting events and their durations. No damage has occurred in any of the published data at vibration levels of less than 12.7mms^{-1} ppv.

10.4.2 Airborne Vibration or Air Overpressure

Whenever blasting is carried out, energy is transmitted from the blast site in the form of airborne pressure waves in a wide range of frequencies, some of which will be above 20Hz, and hence perceptible to the human ear, but most are below the audible range. It is a combination of the sound and concussion that is known as ‘air overpressure’.

Any attenuation due to topography, either natural or man-made, between the blast and the receiver do not significantly reduce air overpressure levels due to the greater amount of energy transmitted in the inaudible frequency range.

Overpressure may vibrate buildings, but actual damage caused by air overpressure is rare. Damage in the form of broken windows is possible but extremely unlikely below 140dB; more frequently the perception of vibration, and consequently complaints, are highlighted by windows and loose ornaments rattling which is possible at 120dB.

Meteorological conditions, such as wind direction and velocity, cloud cover, humidity and temperature inversions, also influence the intensity of air overpressure levels at any given location. In view of this, the level of air overpressure experienced, irrespective of how well the blast is designed, is often outside of the operator's control.

In this context, MTAN1 notes that "b*ecause air overpressure is transmitted through the atmosphere, meteorological conditions such as wind speed and direction, cloud cover and humidity will all affect the intensity of the impact. In view of this unpredictability, planning conditions to control air overpressure are unlikely to be enforceable. This is not a reason for doing nothing and careful blast design should be able to resolve excessive levels of air overpressure* (ref para 81).

This advice was reflected in the drafting of condition 24 of the ROMP schedule of conditions, referred to above.

10.4.3 Fly-rock

Fly-rock is the unexpected projection of material from the blast site to any area beyond the designated safety area. Fly-rock occurs when the amount of explosive energy is greater than that required to break the mass of rock between the blast position and the free face. The excess energy projects the rock debris beyond the safety area.

Due to improvements in blast design technology, fly-rock incidents are extremely rare.

10.5 Blast Monitoring Data

All blasts are monitored at Crag yr Hesg Quarry, and a copy of the most recent data base, reflecting the measures set out in the submitted Blast Monitoring Scheme, is produced as **Appendix 10.2**.

This records the results of all blasts undertaken since August 2018, up to December 2020 with, inter alia, details of the date of the blast, charge weight, monitoring location relevant to the location of the blast, and the ground vibration recorded. (The reference to a 'Digishot' is an electronic detonation system which uses alternate timing sequence for the blasts within the shot holes, which serves to improve the efficiency of the blast and reduce related ground vibration).

The blasts are shown to generate ground vibration generally in the region of between 2mms and 3mms ppv, with a maximum of 5.6mms ppv recorded in one blast in August 2019. Importantly all blasts recorded ground vibration less than the 95% limit of 6mms and none reached the upper limit of 10mms ppv (ref ROMP condition 23).

In addition, with the exception of two blasts in January 2019, all blasts were successfully designed to facilitate meeting the upper design limit for air overpressure of 120dB (ref ROMP condition 24).

10.6 Mitigation Measures

There is no additional mitigation required since blasting operations will be designed to continue to meet the requirements of the ROMP conditions, which themselves reflect the advice on blast vibration set out in MTAN1. However, the Operator's Good Practice Guide outlined in the DETR report The Environmental Effects of Production Blasting from Surface Mineral Workings referred to above is already, and would continue to be, adopted to ensure that the potential for ground-borne and airborne vibration would be minimised at Craig yr Hesg Quarry. This would include:

1. Making accurate surveys & recording of blast area as per the Quarries (Explosives) Regulations 1988.

2. Ensuring correct blast design including correct relationship between burden, spacing and hole diameter.

3. Ensuring accurate drilling, keeping sub-drill to the minimum required.

4. Making accurate surveys & recording of blast holes as per the Quarries (Explosives) Regulations 1988. If necessary, blast design would be revised in light of survey data.

5. Maximising use of free faces including by careful planning of delay sequences.

6. Optimising maximum instantaneous charge weight by:
   - Reducing number of holes;
   - Reducing instantaneous charge by decking charges (if necessary);
   - Reducing bench height or hole depth;
   - Reducing borehole diameter.

7. Optimising blast ratio in any changes to design.

8. Where practicable ensuring direction of detonation away from sensitive areas.

9. Wherever possible use of unconfined charges would be avoided particularly where fissures or broken ground or weaken of rock from previous blasting is known to be present.

10. Wherever possible the use of surface lines of detonating cord would be avoided. All surface detonators and explosives would be adequately covered with suitable material.

11. Stemming material would be of sufficient quality and quantity to confine adequately all explosives upon detonation. A coarse stemming material such as angular chippings should be considered. Drill fines would not be used.

12. Bottom initiation would be considered in preference to top initiation.

13. Misfire procedures would have due regard to under-burdened charges.

14. If air overpressure is found to be a potential problem consideration would be given to reducing blast panel area.

15. Blasting would be undertaken at regular times.

16. Ground and airborne vibration levels would be monitored regularly so that information may be employed into any necessary modifications of future blast designs.

10.7 Residual Effects

Blast-induced vibration is a short-term phenomenon lasting only for very short periods during the blasting event with no residual effects.

10.8 Recommendations

The straightforward recommendation is that quarrying operations for the requested extended time period should continue to be regulated by the blast control measures set out in the ROMP planning conditions, and by adherence to the 'good practice' mitigation measures set out in Section 10.6 above.

The development should also continue in accordance with the blast monitoring scheme which has been submitted to RCT, with all blast events monitored and recorded in accordance with the requirements of that scheme.

10.9 Conclusions

Criteria for restricting vibration levels from blasting operations at Craig yr Hesg Quarry are in place via planning conditions imposed as part of the ROMP Review, where the defined limits are set at levels recommended by Welsh Government as being adequate to minimise impacts on nearby residents.

These limits will ensure that where the proximity of residential locations is the governing factor, all vibration will be restricted to a low order of magnitude and would be entirely safe with respect to the possibility of even the most cosmetic of plaster cracks.

With such low ground vibration levels accompanying air overpressure would also be of a very low and hence acceptable level, although possibly perceptible on occasions at the closest of properties.

It should also be noted that in determining the ROMP Review application, RCT concluded that the blast vibration control measures would be adequate to regulate the development based upon the quarry development scheme as defined, and the lateral and depth limits enshrined within that scheme. The current Section 73 application is confined to a requested time extension within which to complete the implementation of that scheme. The volume of rock to be extracted per annum would not change, and the frequency of quarry blast events to extract the rock would similarly not materially change - they would simply be extended out over a longer period.

Given that it is not proposed to amend the approved working scheme, it follows that the existing blast vibration controls must be suitable to regulate the remaining operation.

11.0 AIR QUALITY AND DUST

11.1 Introduction

This Chapter has been prepared by Smith Grant LLP (SGP) and details the dust and air quality assessment carried out as part of the EIA undertaken in connection with the continuation of existing activities at the Site.

The planning application boundary for the Proposed Development is complex as discussed in Chapter 2. Hence for the purposes of this Chapter and the assessment of potential air quality impacts, the term 'Site' has been used to refer to the quarry and areas associated with the processing and operational activities along with the access / exit road off the local highway.

This Chapter describes the methods used to assess the baseline conditions currently existing at the Site and surroundings, the potential severity of direct and indirect air quality impacts of the Proposed Development, and the mitigation measures required to prevent, reduce or offset the impacts and the significance of residual effects.

The proposals are for continuation of the existing consented operations at the Site and as such there are no proposals for any changes to the existing methods of working.

The following assessment has taken the same approach as the air quality assessments carried out for the 2010 ROMP and 2015 Western Extension Environmental Statements and is focused primarily on potential impacts and effects resulting from mineral dust emissions (disamenity dust and suspended particulate matter (PM_{10} / $PM_{2.5}$)) arising from site activities. In addition, consideration has been included with respect to exhaust emissions (where this refers to nitrogen oxides (NO_x) and particulate matter (PM_{10} / $PM_{2.5}$) arising from vehicles travelling to and from the Site.

11.1.1 Competence

The Chapter has been prepared by Smith Grant LLP, an environmental consultancy specialising on air quality. The author is an environmental scientist with over 20 years' experience in the field of environmental risk management now specialising in the assessment of air quality. The author regularly provides air quality input to planning applications for a wide range of developments including mixed-use, industrial and mineral extraction. The author is a Member of the Institute of Air Quality Management (IAQM).

SGP is familiar with circumstances at Craig yr Hesg Quarry having been continually involved in monitoring and related air quality issues at Craig yr Hesg since 2009, and, pursuant to updated planning conditions imposed as part of the ROMP Review. SGP was responsible for the Air Quality Assessments undertaken as part of the EIA and ES submitted to accompany the Environment Act ROMP Review application in 2010 and Western Extension application in 2015. This following assessment therefore builds on those previous assessments.

11.1.2 Technical Context

Mineral extraction, processing and handling operations may give rise to releases of airborne particulate matter (PM) or dust. The nature and quantity of airborne matter released at any one time will depend on a wide variety of factors including, but not limited to, the nature and quantity of the material being handled, the handling processes incorporated and the weather conditions at the time of handling.

Airborne particulate matter is made up of condensed phase (solid or liquid) particles suspended in the atmosphere and ranges in size from a few nanometres to around 100µm. Particulate matter comes from both man-made and natural sources and can give rise to both soiling effects through dust deposition (often referred to as 'disamenity' or 'nuisance' dust) and human health effects through suspended particles.

Dust soiling will arise from the deposition of particulate matter in all size fractions but will mostly be associated with particulate matter of diameter greater than 30 µm. Particles below 10µm (referred to as PM_{10}) correspond to the inhalable fraction of particulate matter and, depending on the nature and concentrations of the particles, can be associated with health impacts. PM_{10} includes both fine (those particles of diameter below 2.5 µm; referred to as

$PM_{2.5}$) and coarse (diameter between 2.5-10µm; $PM_{2.5-10}$) fractions of airborne particulate matter which normally arise from different sources.

Haulage transport to and from the Site and non-road mobile machinery (NRMM) will also result in emissions of, primarily, oxides of nitrogen (NO_x; comprises nitrogen dioxide (NO_2) and nitric oxide (NO)) and PM_{10} / $PM_{2.5}$. NO itself is not considered harmful to human health. However, on release to the atmosphere it usually oxidises rapidly to NO_2 which is associated with adverse effect on human health, causing inflammation of the lungs at high concentrations. Long term exposure to NO_2 can affect lung function and respiratory symptoms.

11.2 Legislation, Guidance and Industry Good Practice

11.2.1 European Legislation

Action to manage and improve ambient air quality within the UK has historically been driven largely by European (EU) legislation. The majority of European air quality legislation is consolidated under Directive 2008/50/EC on Ambient Air Quality and Cleaner Air for Europe, which came into force on 11th June 2008 consolidating an earlier Directive and three daughter directives. The legislation sets legally binding European-wide air quality limit and interim target values (Ambient Air Directive (AAD) Limit and Target Values) for concentrations in outdoor air of major air pollutants for the protection of human health and ecosystems and prescribes how air quality should be assessed and managed by Member States.

11.2.2 UK Legislation

The Air Quality (Standards) (Wales) Regulations 2010 implement EU Directives 2008/50/EC and 2004/107/EC, a fourth daughter directive, transposing the AAD values into UK legislation. In the UK responsibility for meeting the AAD Limit and Target Values is devolved to the national administrations; the Department for Environment, Food and Rural Affairs (Defra) co-ordinates assessment and air quality plans for the UK as a whole.

Under the Environment Act 1995 the UK Government and the devolved administrations are required to produce a national Air Quality Strategy[11] (AQS). This was last reviewed and published in 2007. The UK AQS sets out air quality objectives (AQOs) and policy options to improve air quality within the UK. The strategy sets AQOs for specific pollutants deemed to pose a risk for human health or other receptors, a number of which are derived from the EU limit and target values, although requirements for compliance vary. The UK AQS includes more exacting AQOs for some pollutants than those that have been required by EU legislation.

Existing UK policy and legislation relating to $PM_{2.5}$ acknowledges the fact that there are no clear concentrations of particulate matter below which health effects do not occur. However, the approach is to reduce the overall exposure of the population to $PM_{2.5}$ rather than aiming at reducing concentrations at 'hot-spots'. The expectation is that the objectives and limit values for PM_{10} that drive policies to reduce PM concentrations in hot-spots will also help to reduce $PM_{2.5}$ in these locations.

Part IV of the Environment Act 1995 imposes a duty on local authorities in the UK to review existing and projected air quality in their area. Any location likely to exceed the UK AQOs must be declared an Air Quality Management Area (AQMA) and an Action Plan prepared and implemented, with the aim of achieving the objectives. This process is referred to as Local Air Quality Management (LAQM). The LAQM process is supported by national statutory policy[12], published by each country within the UK separately, and technical guidance[13] provided by Defra.

The standards and objectives relevant to the LAQM framework are prescribed through the Air Quality (Wales) Regulations 2000 and Air Quality (Wales)(Amendments) Regulations 2002.

[11] Defra, The Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007
[12] Welsh Government, Local Air Quality Management in Wales, Policy Guidance, June 2017
[13] Defra, Local Air Quality Management, Technical Guidance (TG16), February 2018

The air quality objectives and limit values currently applicable to the UK can therefore be split into two groups. Each has a different legal status and is therefore handled differently within the framework of UK air quality policy. These are:

- UK AQOs set down in regulations for the purposes of local air quality management; and
- European Union (EU) AAD limit values transposed into UK legislation for which compliance is mandatory.

The applicable EU limits and target values and UK AQOs relevant to the Site and Proposed Development with regards to the protection of human health, referred to in this Chapter as Air Quality Assessment levels (AQALs), are summarised in the table below:

Table 11-1 Relevant Air Quality Assessment Levels (AQALs) for Protection of Human Health

Pollutant	AQAL	Averaging period	Source
NO_2	200 µg/m^3	Hourly mean, not to be exceeded more than 18 times per year (99.79%ile)	AAD Limit Value / AQO
	40 µg/m^3	Annual mean	AAD Limit Value / AQO
PM_{10}	50 µg/m^3	24 hour mean, not to be exceeded more than 35 times per year (90.41%ile)	AAD Limit Value / AQO
	40 µg/m^3	Annual mean	AAD Limit Value / AQO
$PM_{2.5}$[1]	25 µg/m^3	Annual mean	AAD Limit Value
	% reduction relative to average exposure indicator (AEI) dependent on initial concentration; to at least 18 µg/m^3	Annual mean	AAD Limit Value

1. $PM_{2.5}$ – not regulated through the LAQM regime

Statutory objectives, limit and / or target values for PM_{10} and $PM_{2.5}$ are provided in the regulations implementing the requirements of the EU Directives and the UK Air Quality Strategy. The EU Directives impose stricter standards on $PM_{2.5}$ than the Strategy. However, there are no regulatory standards for $PM_{2.5}$ within the LAQM system, and $PM_{2.5}$ is currently regulated at a national, rather than local, level. Local Authorities do not presently have an obligation to review and monitor $PM_{2.5}$ but are expected to work towards reducing $PM_{2.5}$ emissions and concentrations in their area as far as practicable.

For the purposes of the AQALs ambient air refers to the outdoor air and excludes workplaces where members of the pubic do not have regular access. Advice is given in Defra guidance as to where the UK AQOs should apply as summarised below; slightly different compliance requirements are provided for EU limit and target values:

Table 11-2 Summary of where the AQOs should apply

Averaging period	Locations where the AQO should apply
Annual mean	All locations where members of the public might be regularly exposed; including facades of residential properties, schools, hospitals, care homes etc
24-hour mean and 8-hour mean	All locations where the annual mean objectives apply together with hotels and gardens of residential properties
National1-hour mean	All locations where the annual mean, 24-hour and 8-hour means apply; also kerbside Sites, parts of car parks, bus stations and railway stations which are not fully enclosed and any outdoor locations where members of the public might reasonably be expected to spend 1 hour or longer.
15-minute mean	All locations where members of the public may be reasonably exposed for a period of 15 minutes.

The AQOs do not apply at building facades or other places of work where members of the public do not have regular access.

Table 11-3 Additional AQALs for the Protection of Vegetation and Ecosystems

Pollutant	AQAL	Averaging period
nitrogen oxides (as NO_2)	30	annual mean
	75	daily mean

In addition, Critical Loads are provided in relation to nutrient nitrogen deposition and acidity deposition; these are dependent on the specific habitat and location.

In January 2019 Defra published the **Clean Air Strategy**[14]. This sets out the UK Government's plans for dealing with all sources of air pollution. The strategy gives a detailed breakdown of the action that is required across the UK to meet the legally bindings international targets to reduce emissions of NO_x and other pollutants. The strategy also supports the implementation and roll out of Clean Air Zones (CAZs) in the most polluted areas of the UK.

In August 2020 the Welsh Government published a **Clean Air Plan for Wales**[15] whjch sets out the Welsh Government's plans for improving air quality over a 10-year pathway. This includes proposals for a new Clean Air Act for Wales to enhance existing legislation and introduce new powers to further tackle air pollution. A number of potential legislative proposals for inclusion in such a Clean Air Bill are set out in the recently published Welsh Government **White Paper**[16] which is currently out for consultation. Proposals include for requiring reviews of a Clean Air Plan or Strategy every 5 years, for the Welsh Government to set air pollution targets, introduction of an air quality target setting framework in Wales including for $PM_{2.5}$, consolidation of existing

[14] UK Government, Clean Air Strategy, published 14 January 2019, https://www.gov.uk/government/publications/clean-air-strategy-2019

[15] Welsh Government, Clean Air Plan for Wales, Healthy Air, Healthy Wales, Final, published August 2020;

[16] Welsh Government: White Paper on a Clean Air (Wales) Bill, issued 13 January 2021

legislative framework such as under LAQM and Smoke Control Areas, enhancement of the existing LAQM regime and revisions to smoke control legislation. It is estimated that the drafting of the Bill would commence in 2022 with final legislation to follow.

11.2.3 Planning Policy

National Planning Policy and Guidance

Planning Policy Wales[17] sets out the Welsh Government's planning policies for Wales and how these are expected to be applied. Section 6.7 of the PPW is titled Air Quality and Soundscape Framework and provides some guidance to local authorities on taking air quality into account in planning policies and decisions.

Section 6.7.5 states that '*the key planning policy principle is to consider the effects which proposed developments may have on air or landscape quality and the effects which existing air or soundscape quality may have on proposed developments*.'

Section 6.7.6 states: *'In proposing new development, planning authorities and developers must, therefore:*

- *address any implication arising as a result of its association with, or location with, air quality management areas, noise action planning priority areas or areas where there are sensitive receptors;*
- *not create areas of poor air quality or inappropriate soundscape;*
- *seek to incorporate measures which reduce overall exposure to air and noise pollution and create appropriate soundscapes.*

Section 6.7.7 states: *'To assist decision making it will be important that the most appropriate level of information is provided and it may be necessary for a technical air quality and noise assessment to be undertaken by a suitably qualified and competent person on behalf of the developer.'*

Section 6.7.14 further states: *'Proposed development should be designed wherever possible to prevent adverse effects to amenity, health and the environment but as a minimum to limit or constrain any effects that do occur.'*

Further advice specific to mineral extraction and dust and air quality is provided in the Mineral Technical Advice Note (Wales) 1: Aggregates[18] (MTAN) which provides advice on how to reduce the impact of aggregate production in relation to dust in paragraphs 72–77. The MTAN discusses the roles of planning conditions and environmental permitting regimes in the controls of and protection against dust emissions and emphasises that care should be taken to avoid duplication of controls.

Local Planning Policy and Guidance

The Rhondda Cynon Taf Local Development Plan (LDP)[19] forms the currently adopted development plan and which was adopted in March 2011. Policy AW 10 – Environmental Protection and Public health states:

'Development proposals will not be permitted where they would cause or result in a risk of unacceptable harm to health and / or local amenity because of:

1. *Air pollution;*

….unless it can be demonstrated that measures can be taken to overcome any significant adverse risk to public health, the environment and / or impact upon local amenity.'

[17] Welsh Government, Planning Policy Wales, Edition 11, February 2021. Available at: https://gov.wales/planning-policy-wales

[18] Welsh Assembly Government (March 2004), Minerals Technical Advice Note (Wales) 1: Aggregates.

[19] Rhondda Cynon Taf Local Development Plan, adopted 2nd March 2011

RCT is currently progressing preparation on its' Local Development Plan (LDP) for the period 2020-2030.

11.2.4 Dust Standards and Control

Dust deposition may give rise to annoyance, dis-amenity or an acknowledged nuisance, through the unacceptable effects of emissions. Deposited dust as such is not regulated under the above requirements and there are no European or UK statutory standards or recommended levels in relation to dust deposition.

Public concerns relating to dust accumulation and soiling may be related to a range of factors including the nature of a site and locality and baseline levels. Controls are typically achieved through conditions within planning permissions and / or Environmental Permits requiring the implementation of a dust management plan to prevent amenity impacts. Deposited dust may also give rise to a 'nuisance' as Statutory, private and public nuisance as defined in environmental law and in so far as nuisance relates to unacceptable effects of emissions. It is recognised however that a significant loss of amenity may occur at lower levels of emission than that which would constitute a statutory nuisance.

11.2.5 Industrial Pollution Controls

A wide range of industrial, waste and agricultural installations require an Environment Permit to operate under the Environmental Permitting (England and Wales) Regulations 2016 (EPR), and subsequent amendments. The aim of the permitting system is to prevent, and where that is not practicable, reduce~~,~~ emissions to air, water and land by potentially polluting and other installations.

Operations and installations that are operated under a Permit are required to operate in such a way that a) all the appropriate preventative measures are taken against pollution, in particular through the application of the best available technique; and b) no significant pollution is caused. Permits are issued by either Natural Resources Wales or the Local Authority dependant on the nature and size of the facility.

The quarry processing activities at the site are regulated under the Environmental Permitting regime, as discussed below in Section 11.6.1.

11.2.6 Additional Guidance and Best Practice

The IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning[20] document provides specific non-statutory guidance in relation to dust and mineral sites. The guidance clarifies when a dust assessment is required and outlines a recommended methodology for carrying out impact assessments and determining the significance of impacts and effects. The guidance also sets out suggested approaches to mitigating emissions and impacts. Although the guidance is designed specifically for use in England, it is considered that it can be adapted appropriately for use in the devolved administrations such as Wales.

The IAQM Guidance on the Assessment of Dust from Demolition and Construction[21] provides supplementary planning guidance on the control of dust and emissions from construction and demolition. Parts of this guidance may also be applied to quarrying activities where these present similar risks of impacts, and the relevant guidance is referred to concerning mitigation measures.

The IAQM Planning for Air Quality[22] document provides specific non-statutory guidance on air quality and the planning system for new development. The guidance provides indicative criteria in relation to changes in vehicle

[20] Institute of Air Quality Management (2016), Guidance on the Assessment of Mineral Dust Impacts for Planning, v1.1

[21] Institute of Air Quality Management (2014), Guidance on the Assessment of Dust from Demolition and Construction, v1.1

[22] Institute of Air Quality Management (2017), Land-Use Planning & Development Control: planning for Air quality, v1.2

movements that would indicate the need for detailed assessment with regards to exhaust emissions.

11.3 Assessment Approach

11.3.1 General Approach

The assessment has followed the approach taken for the 2010 ROMP and 2015 Western Extension Environmental Statements and has focused on consideration of mineral dust emissions, where this refers to disamenity dust and particulate matter (PM_{10} and $PM_{2.5}$) arising from site activities. The assessment has additionally considered vehicle exhaust emissions where this refers to nitrogen oxides (NO_x) and particulate matter (PM_{10} / $PM_{2.5}$) arising from vehicles travelling to and from the site.

The assessment has been undertaken in accordance with the frameworks outlined in MTAN1[6] and the relevant IAQM guidance documents.

In undertaking this assessment SGP carried out the following activities:

- site visit to view the Site, current operations and surrounding environs including receptor locations;
- review of Proposed Development information including layout, current and future activities, working plans and phases and processing plant;
- review of available RCT air quality reports and monitoring data;
- review of SGP site related air quality reports and monitoring data;
- review of other baseline air quality data, including existing potential pollution sources;
- review of local and on-site weather conditions, including wind speed and direction;
- qualitative air quality assessment considering potential sources of dust, PM_{10}, site mobile and fixed pant aerial emissions, location and orientation of human and ecological receptors, prevailing wind direction and screening provisions.

The Site has been subject to an on-going process of air quality assessment and review with respect to PM_{10}, with on-site PM_{10} monitoring undertaken by Hanson since December 2009. Off-site PM_{10} monitoring has been undertaken by RCT since at least 2007. This monitoring data has, and continues to be, collated and reviewed in regular monitoring reports as discussed below in Section 11.4. This work has been accompanied by regular sites visits by SGP personnel over time.

A visit to view the current working conditions was undertaken on 4th February 2021. The visit was undertaken by K Hawkins, Partner, SGP.

11.3.2 Methodology

The assessment of potential pollutant impacts uses the source-pathway-receptor concept and considers the potential magnitude of a release (the source potential), the effectiveness of the pathway (i.e. dispersion of a pollutant towards a receptor), and the sensitivity of the receptor.

The assessment therefore considers the location of the extraction, processing and restoration activities and haulage routes of the continued activities in relation to sensitive receptors, the existing monitoring data, and the control measures to be implemented, to assess the probability of significant adverse air quality impacts occurring during normal operations. Consideration is made of the orientation and distance of receptors to the Site and the prevailing weather conditions.

Full details of the assessment methodologies are provided in **Appendix 11-1** and are summarised below.

Dust and PM_{10} Impact Assessment

The dust assessment has been undertaken with reference to the IAQM guidance on mineral extraction[8] and construction dust[9] with appropriate modification for the proposed activities.

The assessment incorporates the consideration of dust and PM_{10} mitigation measures, including physical measures incorporated within the overall development design, such as the proposed location of operations and provision of bunds, and standard good practice measures that are currently

incorporated within the management and operation of the Site as part of normal working practice. The assessment is used to determine any additional measures that may be required to ensure any adverse impacts are mitigated to acceptable levels.

Vehicle Emissions Assessment

The requirement for detailed assessment of impacts associated with vehicle exhaust emission was undertaken through reference to IAQM guidance on air quality and planning[9]. The level of assessment was determined through an initial screening review of predicted vehicle movements, vehicle routing and locations of existing receptors on the local road network.

The screening assessment determined that further detailed assessment with respect to the impacts of vehicle exhaust emissions was not necessary, as detailed below in sub-section 11.5.

11.3.3 Identification of Receptors

Receptors considered in this assessment comprise:

- human receptors: locations where a person or property may experience adverse impacts of airborne dust or exposure to ambient pollution (i.e. residential, leisure, amenity and sensitive commercial use);
- ecological receptors: where this refers to any sensitive habitat that may be affected by dust soiling or increased ambient pollution (e.g. locations with an international, national or local designation and sensitive habitat features).

The sensitivity of the receptors to potential impacts from aerial emissions, whether changes in pollutant concentrations or dust soiling, has been determined as detailed in the relevant guidance as described in **Appendix 11-1.**

11.3.4 Study Areas

Dust and PM_{10} Impact Assessment

Large dust particles, which make up the greatest proportion of dust emitted from mineral workings (>30 µm) will largely deposit within 100m of the source. Intermediate sized particles (10-30 µm) may travel up to 200-500m. The IAQM guidance on mineral dust advises that adverse dust impacts from sand and gravel sites are uncommon beyond 250m and from hard rock quarries beyond 400m, as measured from the nearest dust generating activities.

The IAQM guidance on construction activities advises assessment distances of up to 350m of a site boundary and up to 50m from edges of roads used by exiting site traffic up to a distance of 500m from the access / egress point. The Site is served by a wheel wash beyond which is a tarmacked surfaced entry/exit route.

The Dust Impact Assessment has considered receptors up to 400m from the boundary of the working and processing areas and up to 50m of the edge of the site access road up to a distance of 500m from the wheel wash.

Suspended particulate matter can travel further from sources, however the greatest potential elevated PM_{10} concentrations also occur within 100m of a source. PM_{10} may persist beyond 500m but site emissions would be expected to merge within background PM_{10} levels outside this distance due to dispersion.

The Dust Impact Assessment Study Area is shown below in Figure 11-1.

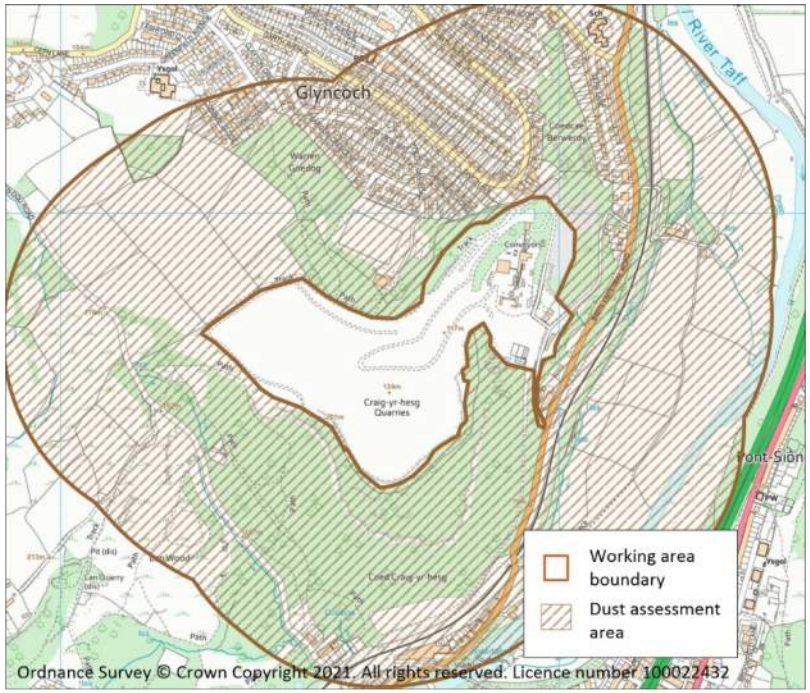
Vehicle Emissions Assessment

The assessment considers receptors adjacent to the roads along which the development related HGVs will travel. IAQM guidance does not specify at what distance a receptor should be to an affected road to indicate the need for further assessment. However, pollution concentrations are known to fall rapidly away from the roadside and are expected to return to background levels within 100m of a road source.

For the purposes of the assessment reference is made to HE DMRB[23] guidance which requires assessment of receptors within 200m of affected roads. Where there are no receptors within 200m of affected roads vehicle emissions are not considered further and potential impacts can be considered *negligible*.

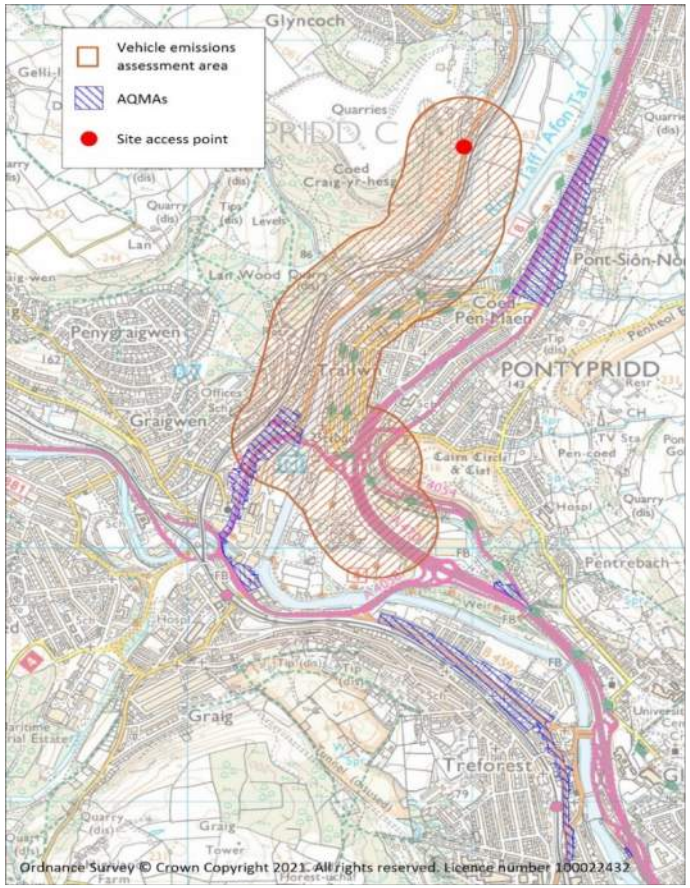
The Vehicle Emissions Assessment Study Area is shown below in Figure 11-2.

Figure 11-1 Dust Impact Assessment Study Area



The Working Area boundary has been taken as the quarry and areas associated with the processing and operational activities along with the access / exit road off the local highway

Figure 11-2 Vehicle Emissions Assessment Study Area



23 Highways England (HE), Design Manual for Roads and Bridges (DMRB), Volume II Environmental Assessment, Section 3 Environmental Assessment Techniques, Part 1, HA 207/07, Air Quality, May 2007

11.3.5 Scoped Out Matters

The operation of on-site plant and machinery (non-road mobile machinery (NRMM)) during the operations will also give rise to vehicle exhaust and combustion plant emissions. However, these are typically considered unlikely to give rise to significant impacts on local air quality and further consideration has been scoped out of this assessment.

11.3.6 Assessment of Significance

The resulting effects of aerial emissions are the consequences of the potential impacts, i.e. changes in pollutant concentrations and / or deposition, at receptors. IAQM guidelines do not provide a traditional matrix assessment of significant effects with regards to air quality. The frameworks outlined in the guidance above provide methodologies for describing air quality impacts and resulting effects at individual receptors. These frameworks are therefore used as a starting point to assess the significance of predicted effects.

Where *negligible* impacts are predicted the overall effects will be ***not significant***. In general, where *slight* impacts at receptors are predicted the resulting effects would be considered to be ***not significant***. *Moderate* and *substantial* impacts could result in ***significant*** effects. However, the judgement of the overall significance of the air quality effects of the proposals is informed by the predicted impacts and effects at individual receptors and takes account of a number of factors, such as, but not limited to:

- the existing and future air quality in the absence of the Proposed Development;
- the extent of current and future population exposure to the impacts and the severity of those impacts, whether in relation to ambient pollutant concentrations or dust soiling;
- whether the predicted impacts potentially result in failure to achieve compliance, or enhance compliance, with EU AAD values and / or UK AQOs and national and / or local air quality action plans;
- whether the predicted impacts potentially result in the need for declaration of a new or extended AQMA, or removal of an existing AQMA;
- whether the predicted impacts potentially result in permanent or temporary damage or improvements to nature conservation sites of local, national or international importance and the geographical extent of those impacts; and,
- the influence and validity of any assumptions adopted when undertaking the prediction of impacts.

11.4 Baseline Conditions

11.4.1 Site and Surroundings

Site Setting

Full details on the site setting and surrounds are set out elsewhere in the ES and only the key aspects of relevance to the Air Quality Assessment are briefly summarised here.

The Site is located within an area of elevated ground about 1km north of Pontypridd and on the western valley side to the River Taff. Site access is gained off the B4273 Ynysybwl Road / Berw Road and the quarry extends westwards across into the hill of Craig yr Hesg with land falling to the north towards the Clydach Valley and to the south towards Nant Tairheol.

Extensive woodland, Coed Craig Yr Hesg, bounds the Site to the southeast, south and southwest and lying between the Site and the residential development of Pontypridd.

More fragmented woodland and scattered trees are present to the north of the Site, beyond which lies the Glyncoch housing estate. The nearest properties within the estate include a Spar supermarket and old peoples flats, located within 10m of the Site boundary. Residential properties on Glyncoch Avenue and Gardiner Close extend to within 20m of the Site boundary. Two schools are located within the Glyncoch Estate, Glyn Coch Primary School and Cefn Primary School, both of which lie beyond 250m of the Site boundary.

The estate extends to the west with woodland and the Glyncoch Rugby Football Club providing separation to housing on Pearson Crescent and Coed-y-Lan Road.

To the west of the Site the B4273, Ynysybwl Road runs north-south along the side of the River Taff valley. Residential properties lie along stretches of this road, with Rogart Terrace being located adjacent to the site entrance.

Several informal footpaths cross the woodland to the north and south of the Site. The nearest public footpath lies about 175m to the southwest beyond the Nant Tairheol.

Nature Conservation Sites

Full details on nature conservation sites identified in the locality are provided in Chapter 7: Ecology. Those considered of relevance to the Air Quality Assessment are summarised below.

There are no international or national statutory designated nature conservation sites (SPAs, SACs, RAMSARs, SSSIs etc) within 500m of the Site.
There are a number of locally designated sites (Sites of Importance for Nature Conservation (SINCs)) within 500m of the Site as listed below:

- Craig yr Hesg / Lan Wood Local Nature Reserve (LNR) / SINC: adjoins the Site to the south / southeast;
- Taff and Rhonda Rivers SINC: extends to within 270m to the east.

11.4.2 Baseline Survey Information

Existing air quality (baseline) data have been obtained via published sources, RCT records and Hanson monitoring data for the site itself.

Air Quality Management Areas (AQMAs)

As part of the LAQM process RCT has declared several AQMAs within its area, of which four are located within, or close to, Pontypridd. All of these have been declared due to potential or existing breaches of the long-term AQO for NO_2; none have been declared due to potential breaches of either the long-term or short-term PM_{10} AQOs. These four AQMAs are summarised below in Table 11.4.

Table 11-4 Air Quality Management Areas within or near to Pontypridd

AQMA	Air Quality Objective Exceeded	Description
Pontypridd Town Centre AQMA	Annual mean NO_2	Declared in 2007, amended in 2009; encompasses properties along Broadway and the High Street, includes Taff Street down to Sardis Road.
Cilfynydd	Annual mean NO_2	Declared 2007; certain properties from Pontshonnorton Road to Merthyr Road and land west of these points to the A470
Broadway	Annual mean NO_2	Declared 2007, amended 2012 and 2020; all properties from Broadway via Fothergill St to Park St

AQMA	Air Quality Objective Exceeded	Description
Nightingales Bush	Annual mean NO_2	Declared 2009; all properties at Nightingales Bush to Pentrebach Road

The locations of these AQMAs in relation to the Site are shown in Figure 11-2. The principal AQMA considered of interest in relation to the Proposed Development is the Pontypridd Town Centre AQMA through which the majority of current site-related HGVs travel. The status of this AQMA and RCT monitoring undertaken within the AQMA is discussed further in Section 11-4 below. As noted in the RCT 2020 ASR the Pontypridd Town Centre AQMA has been subject to permanent traffic control management and improvement measures aimed to reduce congestion and reduce the likelihood of locally elevated levels of NO_2.

In 2009 RCT determined that indicative PM_{10} monitoring that had been undertaken at Glyncoch identified a risk of breaching the 24-hour daily mean AQO for PM_{10} and that further in-depth monitoring was necessary[24]. A Detailed Assessment was subsequently undertaken by RCT[25]; this identified elevated levels of PM_{10} and noted that *Craig yr Hesg Quarry was a likely significant local source of PM_{10} within Glyncoch*, but concluded that further monitoring was required to clarify the situation. This report and RCT's findings were reviewed in detail by SGP in the 2015 Western Extension ES which concluded that it was unlikely that the 24-hour daily mean had been exceeded.

On-going continuous monitoring has since continued to be undertaken by RCT at Glyncoch as discussed below. On the basis of the on-going monitoring results RCT has not progressed to declare an AQMA due to PM_{10} concentrations at Glyncoch and subsequent RCT Air Quality Progress reports state: *…concentrations of PM_{10} throughout Rhonnda Cynon Taf are likely to be below the relevant AQOs, therefore no further action is required at this time'*.

Predicted Background Air Quality Data

Defra publishes predicted background air quality data for certain pollutants for 1km x 1km grid squares across the UK. These are updated on a regular basis due to updates in background data such as vehicle emission factors, vehicle fleet composition and UK wide monitoring.

The current maps were issued in 2020 and are based on 2019 ambient monitoring and modelling data. The maps incorporate information on the age and distribution of vehicles and emission factors and consider existing local sources of emissions. Predicted data is provided by Defra for each year from 2019 to 2030.

Predicted background concentrations of particulate matter and nitrogen oxides for the grid square in which the quarry and nearest receptors are located in, for the current year (2021) and a future year (2025) are summarised in the following table.

[24] Rhondda Cynon Taff County Borough Council, Part IV, Environment Act 1995, Local Air Quality Management, Progress Report, April 2010

[25] Rhondda Cynon Taff County Borough Council, Part IV, Environment Act 1995, Local Air Quality Management, Detailed Assessment of Fine Particulate Matter, April 2014

Table 11-5 Predicted Background Air Quality – Nitrogen Oxides

Grid square	Location	Annual mean concentration (µg/m³)			
		NO_2		NO_x	
		2021	2025	2021	2025
307500 191500	Site (north & Glyn Coch)	8.05	7.04	10.36	8.99
307500 192500	Site (south)	7.35	6.34	9.38	8.04
308500 191500	B4273,Ynysybwl Road	10.18	8.39	13.24	10.78
308500 192500	B4273,Ynysybwl Road	9.80	8.15	12.71	7.54
AQAL		30		40	

Table 11-6 Predicted Background Air Quality – Particulate Matter

Grid square	Location	Annual mean concentration (µg/m³)			
		PM_{10}		$PM_{2.5}$	
		2021	2025	2021	2025
307500 191500	Site (north & Glyn Coch)	11.53	11.04	7.40	7.01
307500 192500	Site (south)	11.57	11.06	7.75	7.34
308500 191500	B4273,Ynysy bwl Road	12.05	11.54	7.92	7.52
308500 192500	B4273,Ynysy bwl Road	12.00	11.49	7.91	7.50
AQAL		40		25	

The predicted concentrations take into account existing sources of air emissions including the existing quarry and local road network. The average background pollutant concentrations for the grid squares in which the Site and nearest receptors are located are all predicted to be substantially below the relevant AQALs.

It should be noted that the data are effectively an average concentration across each 1 km square. As such concentrations may be higher closer to any specific sources.

Local Monitored Air Quality

PM10 Ambient Air Monitoring

RCT undertakes ambient air quality monitoring across its' area in accordance with its duties under LAQM using a combination of continuous analysers and passive diffusion tubes. This monitoring network has included monitoring for PM_{10} since 2008 within the Glyncoch Estate to the north of the Site. It is understood the monitoring was commenced by RCT as it suspected that the quarry may be a significant source of PM_{10} which may adversely affect air quality within the estate. It is understood the monitoring locations were specifically chosen to target the specific quarry source at, or close to, the perceived potential area of maximum impact in an area of relevant public exposure.

Monitoring was initially undertaken by RCT using two Osiris monitors on Upper and Lower Garth Avenue; these monitors form 'indicative monitors' and as such cannot be used to determine compliance with the UK AQOs. They are however capable of providing real-time measurements and provide information that can be used to assess the significance of potential PM_{10} sources and assist in determination as to whether an AQO is likely to be breached or not. Since July 2014 monitoring has also been undertaken using a TEOM FDMS on Upper Garth Avenue; this forms a European Reference method and enables direct comparison with the UK AQOs.

The locations of these monitors are provided in Figure 11-4 and details provided in Table 11-7.

Table 11-7 RCT PM_{10} monitoring sites

Site ID	Location	Grid reference	Type of Location[1]	Distance and Orientation from Site
130*	Upper Garth Ave, Glyn Coch (TEOM FDMS)	307861 192046	Roadside	35m N
63Φ	Upper Garth Ave Osiris	307861 192046	Roadside	35m N
109	Lower Garth Ave Osiris	307927 192096	Roadside	65m N

1: Type as defined by Defra and detailed in RCT 2020 ASR; previous RCT reports referred to the location as 'Industrial'

*: Location as provided in RCT 2020 ASR; differs from grid reference provided in earlier RCT ASRs; RCT has confirmed the 2020 grid reference is correct and the monitor has not been moved

Φ: Use of this monitor ceased in 2019 as is co-located with the TEOM FDMS and provides duplication of data

Results for the period 2014-2019 are as detailed below in Tables 11-8 and 11-9:

Table 11-8 RCT Monitored Annual Mean PM_{10} Concentrations

	Annual mean (µg/m^3)[1]				
Site ID	2015	2016	2017	2018	2019
130	17.86	13.45	18.2	25.1	14.4 φ
63	23.16*	17.41*	17.0*φ	-	22.3 φ
109	22.52*	22.37*	22.3* φ	-	-

Where there are exceedances of the PM_{10} annul mean objective of 40 µg/m^3 these are shown in **bold**

1: Data as presented in RCT air quality reports

*: Measurement corrected using local TEOM FDMS derived factor

φ: Data capture <75%

Table 11-9 RCT Monitored 24-Hour Mean PM_{10} Concentrations

	PM_{10} 24-Hour Means > 50 µg/m^3 (1, 2)				
Site ID	2015	2016	2017	2018	2019
130	13 (34.3)	4 (25.0)	10 (33.8)	13 (48.2)	2 (22.7) φ
63	15 (42.8)*	9 (32.0)*	3 (31.3)* φ	-	-
109	22 (41.5)*	18 (41.5)*	14 (44.1)* φ	-	15 (46.1)* φ

Where there are exceedances of the PM_{10} 24-hour mean objective (50 µg/m^3 not to be exceeded more than 35 times/year) are shown in **bold**

1: Data as presented in RCT air quality reports

2: Number in brackets is the 90.41th percentile of 24-hour means

*: Measurement corrected using local TEOM FDMS derived factor

φ: less than 75% data capture

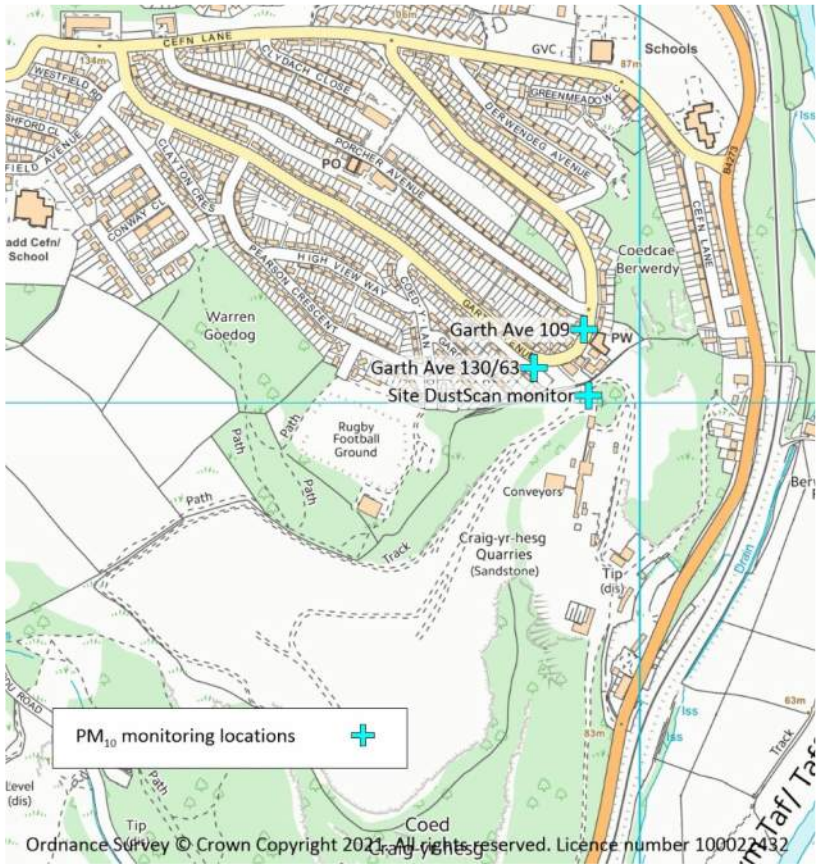
The measured annul mean PM_{10} concentrations at all 3 locations, and in particular at location 130 that uses the EU Reference method, have been well below the long-term UK AQO (<75%) between 2015 and 2019. Similarly, there have not been any exceedances of the short-term UK AQO.

Data for 2020 has been obtained from the Air Quality in Wales website[26]. This reports the 2020 annual mean PM_{10} concentrations to have been 14.44 µg/m^3 and there to have been 4 exceedances across the year *(data up to 30th June 23020 verified; data thereafter currently provisional at the time of writing).*

The results are discussed further in the context of the Site below.

[26] https://airquality.gov.wales

Figure 11-3 PM_{10} Monitoring Locations



NO2 Ambient Air Monitoring

The RCT ambient air monitoring network includes a combination of continuous analysers and passive diffusion tubes for monitoring NO_2 within, and close to, the Pontypridd Town Centre AQMA, the locations of which are summarised below in Table 11-10 and shown in Figure 11-4.

Table 11-10 RCT NO_2 monitoring sites: Pontypridd Town Centre AQMA

Site ID	Location	Grid reference	Type of Location[1]
Continuous Analysers			
120	Pontypridd	307286 190433	roadside
Passive Diffusion Tubes			
79	High St	307202 189878	roadside
80	Morgan St	307345 190531	roadside
81	Sardis Bridge	307123 190022	roadside
83	Ceridwen Terrace	307481 190369	roadside
84	Gelliwasted Rd	307264 190403	roadside

1: type as defined by Defra and detailed in RCT 2020 ASR

Sites 79-81, 84 and 120 are all located within the existing AQMA, whereas site 83 is located is located outside the extent of the AQMA.

Annual mean NO_2 concentrations for these diffusion tubes for 2015-2019 are as detailed below:

Table 11-11 RCT Monitored Annual Mean NO_2 Concentrations

	Annual mean (µg/m³)[1]				
Site ID	**2015**	**2016**	**2017**	**2018**	**2019**
Continuous Analysers					
120	35.9	38.6	31.36	31.67	30.2
Passive Diffusion Tubes					
79	36.3	39.1	35.7	32.3	30.0
80	37.0	**41.3**	35.5	30.7	28.8
81	37.0	39.6	39.0	31.1	32.7
83	36.0	39.4	34.8	32.6	31.5
84	**52.2**	**56.1**	**50.0**	**45.0**	**41.2**

Where there are exceedances of the NO_2 annual mean objective of 40 µg/m³ these are shown in **bold**

1: Data as presented in RCT air quality reports

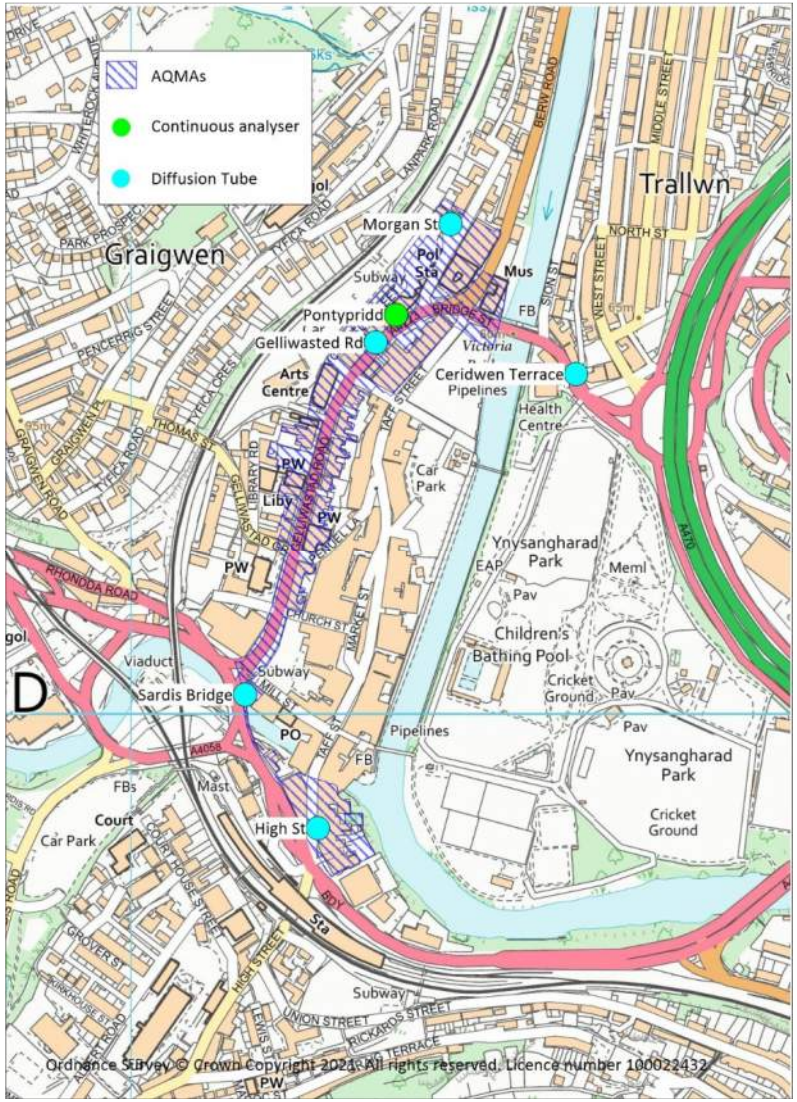
Detailed consideration of the results is provided in the RCT 2020 ASR. The report notes that the annual mean levels of NO_2 have consistently reduced within the Pontypridd Town Centre AQMA over the recent past. This reduction appears to be observed along all the main roads within the AQMA, with only a small part of the existing AQMA, encompassed by Site No. 84 (Gelliwastad Rd West), showing a current breach of the annual mean AQO for NO_2.

All monitoring locations appear to show a noticeable decrease in annual mean levels of NO_2, observed since 2009, with apparent consistent improvement since the most recent peak level in 2016. The 2020 ASR concludes that, dependent upon the outcome of prior consultation, RCT proposes to reduce the current extent of the AQMA.

The proposed amended AQMA is provided in **Appendix 11-2.**

These results and the existing and proposed revised AQMA are discussed further in the context of the development-related HGV movements in Section 11-5.

Figure 11-4 NO_2 Monitoring Locations



Industrial Emissions and Other Activities

Other than the site itself no other industrial activities have been identified in the area that may be significant sources of dust and PM_{10} emissions.

Site PM_{10} Monitoring Data

Hanson has operated a Dustscan PM_{10} monitor located close to the quarry northern boundary with Glyncoch since December 2009 (at national grid reference 307915, 192015). The monitor collects PM_{10} continuously over a period of several days, with filter cartridges generally being changed weekly. The monitoring does not meet EU equivalence requirements for daily PM_{10} monitoring and is not located at a specific point of relevant exposure. However, it does provide useful long term indicative data at a strategic position between potential high risk sources associated with the quarry processing plant and the nearest residential population in Glyncoch.

The results are collated and reported on an annual basis by SGP, with reports having been provided up until November 2020; the latest report for the period November 2019-November 2020 is provided in **Appendix 11-3**. Results for the years 2015-2020 are summarised below in Table 11-8 and compared to the results obtained from the RCT location 130 over the same time period. Because the DustScan monitoring periods are not necessarily constant, the mean results are calculated as time weighted averages (results for each monitoring round are multiplied by the minutes of monitoring, summed together and the divided by the total minutes of monitoring in all rounds).

The number of potential daily exceedances cannot be accurately determined from the Dustscan data due to the smoothing effects of the multiple day monitoring periods. A period average concentration of in excess of 30 µg/m^3 has therefore been used as a threshold value to indicate that there *could have been* one or more days within the relevant DustScan monitoring period when the 24-hour limit could have been exceeded.

Table 11-12 Site DustScan Monitored PM_{10} Concentrations[1]

	2015-2016	2016-2017	2017-2018[3]	2018-2019[3]	2019-2020[4]
On-site PM_{10} monitor					
% data capture	81.5	75.52	55.5	57.21	47.6
PM_{10} average over period	14.48	15.32	15.28	16.33	13.44
PM_{10} time-weighted average	14.52	14.64	15.42	18.02	12.56
% of long-term AQO[2]	36.3%	36.6%	38.6%	45.1%	31.4%
PM_{10} maximum recorded	35.84	71.26	35.54	46.56	51.69
number rounds >50 µg/m^3	0	1	0	0	1
number rounds >30 µg/m^3	1	3	3	6	2
RCT location 130 data hourly PM_{10}					
% data capture	98	96	64	24[5]	98
long-term (annual) average over period	13.7	18.93	21.50	13.4	15.2
% long-term AQO	34.4%	47.3%	54%	33.5%	38%
number of daily exceedances	4	10	13	0	6
% of short-term AQO	11.4%	28.6%	37%	0%	17%

1: Full results are presented in SGP reports R1337-R10, R2613B-R01-R04, reporting periods are from / to mid-November each year

2: Results cannot be directly compared to the UK AQO

3: It is to be noted that due to a malfunction with the on-site monitoring unit it is possible PM_{10} concentrations were over-estimated over parts of the monitoring periods

4: Monitoring period covers the period of the Coronavirus pandemic and as such should be treated with caution when compared to other years to determine any trends etc

5: Low data capture achieved at RCT Upper Garth Avenue across monitoring period

The available data shows reasonable correlation between the site data and the nearby RCT monitoring station at Garth Avenue with neither data sets indicating actual or likely breaches of either the long-term annual mean or short-term 24-hour AQOs for PM_{10}.

The results are discussed further in the context of the Site below in Section 11-5.

Site Dust Deposition Monitoring Data

Disamenity dust deposition monitoring was carried out over the period October to December 2014 to inform the air quality assessment for the Western Extension planning application. The monitoring was undertaken using frisbee type wet and dry gauges at 3 locations, one close to the Primary Crusher and

haul road, a second on the northern side of the quarry void and a third at 26 Conway Close. The third location was distant from the existing and proposed site activities that form this application, being specifically to inform the baseline condition in relation to the proposed Western Extension. A 4th monitoring station on the western quarry perimeter was stolen after the initial monitoring round.

The results indicated elevated dust deposition at the location close to the primary crusher haul road, with the main impacts arising from the south through to northwest directions. It was concluded that the high level of deposition here could be attributable in part to splash back from truck movement along the haul road and / or some organic matter within the overall mass of material collected in the gauge given the proximity of woodland to the station. It was also concluded that the measurements of elevated dust deposition here did not reflect conditions outside the site boundary due to the intervening tree belt.

The location on the north side of the quarry, recorded slightly elevated dust over the first period, but with low, typically rural background levels thereafter. The low deposition rate at this location provided a preliminary indication that dust emissions from the established quarry void were low and unlikely to cause a nuisance outside the site.

Routine deposition dust monitoring is not a requirement of the existing planning permission at the Site and given the absence of any particular changes of note in the locality there is no reason to suspect that background dust deposition rates would have changed substantially.

Nevertheless, for completeness, a short-term three-month dust monitoring exercise is being undertaken comprising deposition and directional dust at several downwind locations, which, where feasible, replicated the original 2014 monitoring locations.

The methodology and results to date are provided in **Appendix 11.4**. Measured dust deposition rates across the March to April 2021 period are all within the ranges previously measured and reported in 2014. This is consistent with expectations that there are no particular changes of note in the locality that would lead to an expectation that background dust deposition rates would have changed substantially since the previously monitoring. It remains concluded therefore that the 2014 data as presented remains appropriate to inform existing deposition dust conditions at the Site.

11.4.3 Local Meteorological Data

The most important meteorological parameters governing the atmospheric dispersion of pollutants are:

- Wind direction: determines the broad direction of the transport of the emission;
- Wind speed: affects the ground level concentrations by determining the initial dilution of pollutants emitted;
- Atmospheric stability: a measure of atmospheric turbulence and hence dispersion of pollutants.

The closest commercial meteorological monitoring stations are located at St Athan, 24km to the south-southwest of the Site, and Rhoose (Cardiff Airport), 24km to the south. These stations are both located close to the Bristol Channel and show similar wind patterns. The previous reports prepared by SGP for the 2010 ROMP and 2015 Western Extension ES compared weather data obtained from these stations to that obtained from on-site meteorological monitoring and concluded that the site measured data consistently shows significant different wind directions. This is most likely due to local topography, the site being located on the western side of a north-south trending valley. The site measured data is therefore referred to inform the dust and PM_{10} assessments.

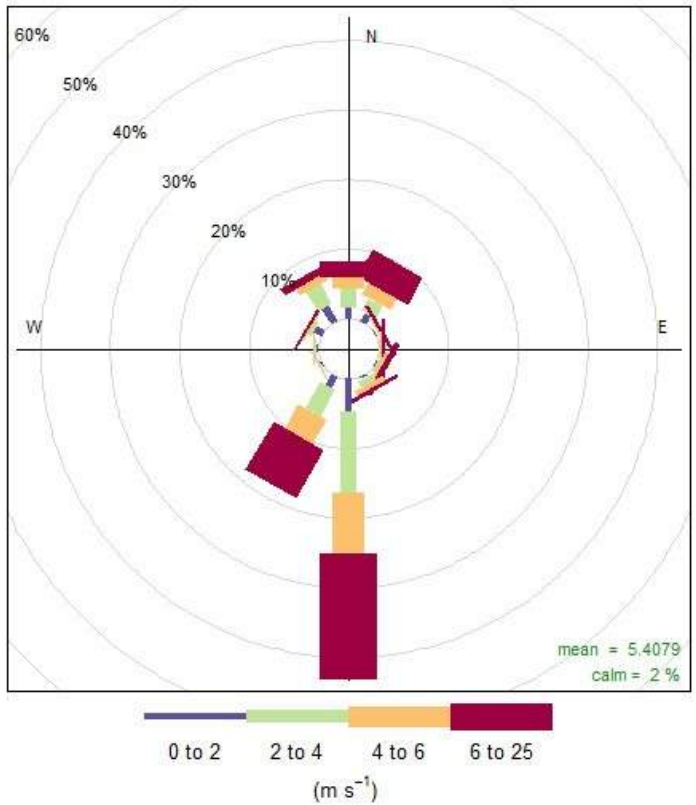
The on-site weather station is located at the northern end of the quarry adjacent to the Primary Crusher. The original meteorological station installed at the site was replaced with a new station in 2019 following technical issues with the original station. Given these issues only data from the new installation has been referred to inform this assessment. The derived windrose from the site data for the years 2019-2021 is provided in Figure 11-5.

This depicts average wind speeds and directions across the two year period.

The data show the prevailing wind direction to be from sectors 180˚ through to 220˚, i.e. southerly / south-south westerly. This is slightly atypical of standard UK conditions, which are predominantly south westerly.

This is also slightly different to that referred to in the Western Extension report which was based on 70% data capture in 2013.

Figure 11-5 Site Measured Windrose (04.01.19-04.01.21)



11.4.4 Existing Operations

Existing operations, comprising the winning and working of minerals and depositing of mineral waste, are consented at the quarry until December 2022. The sale and transportation of any residual stocks is permitted for a further 12 months with restoration to be fully implemented by December 2024. The proposal is for continuation of the existing extraction, processing and mineral waste deposition operations for a further 6 years until December 2028, with a further 1 year for removal of residual stocks and 2 years for restoration. There are no other proposed changes to the existing consented activities.

The site comprises four principal zones:

- the entry / exit road to / from the quarry; this lies outside the designated mining site planning boundary, but is included within the Environmental Permit boundary;
- the haul road between the quarry void and Primary Crusher feed hopper;
- the main quarry void;
- the yard area, including mineral processing plant (including crushing and screening plant), roadstone coating plant (RCP), mineral stockpiles, silt ponds and offices.

The site access and exit lie at the south eastern extremity of the Site with the processing plant and stockpiling areas lying in the eastern area. The main quarry area lies to the west, with a series of quarry faces and benches that have been excavated in a general north-westerly direction. Consented activities also include an asphalt plant (roadstone coating plant (RCP)) which was erected and commissioned in 2016. This replaced an earlier plant that was decommissioned in 2009.

Water supply to the site for dust suppression is provided by a combination of site lagoons and auxiliary mains supply.

Several conditions are included in the current planning permission (08/1380/10) covering the Site that relate directly or indirectly to the control of dust. In particular, Condition 30 details several specific requirements with

respect to the quarrying operations and transportation to minimise the emissions of dust.

The quarry processing activities, which comprise the crushing and screening (using static plant) of sandstone products and the RCP, are additionally controlled under an Environmental Permit PPC/009-3.5-HQPEL/0104D issued by RCT (dated 10th June 2020). No mobile crushing or screening plant is deployed on site. The permit also covers the various directly associated activities with the processes and as such the permitted facility includes the internal haulage routes to the primary crusher, the wheel wash and the site access / exit haul route from the B4273 (termed in the Permit as the Regulated Facility).

The Permit requires the management and operation of the permitted activities and plant using best available techniques to prevent, or where that is not practicable, reduce emissions from the plant. The Permit includes several conditions relating to particulate matter emissions, odour emissions, dust suppression, haul road maintenance and record keeping.

In addition, the site is operated in accordance with the Hanson Environmental Management System which is certified to ISO 14001.

The potential aerial emissions associated with the Site, along with these existing controls and mitigation measures, are discussed further below in Section 11-5. Of particular note, the sensitivity of the land uses to the immediate north of the Site, and proximity of these to the Primary Crusher feed hopper, have historically been identified and extensive improvement works, including the implementation of a PM_{10} Emissions Action Plan (2009), undertaken.

11.4.5 Complaints

The RCT Pollution Control Officer advised SGP that there have been several specific complaints received by RCT regarding alleged particulate matter arising from the Site in the last 5 years. These have related to alleged deposition of particulate matter on property and within internal domestic spaces, visible emissions from plant buildings and blasting, deposition of mineral from haulage vehicles onto the highways.

One complaint in July 2019 was related to dust observed along Berw Road and resulted in a written warning to Hanson[27]. It is understood this was associated with very low water levels in the lagoons resulting in the exit road sprays and wheel wash to run dry; appropriate actions were taken by the operator such that no further action was taken.

A complaint in November 2016 was related to visible particulate matter understood to have arisen from the RCP and resulted in a written warning to Hanson[28]. The particulate matter plume is understood to have arisen due to a breakdown in the abatement plant, is reported as not having crossed the installation boundary and appropriate actions are reported as having been taken by the operator such that no further action was taken.

11.4.6 Inspections

The site is subject to inspections by RCT under the Environmental Permit. These are typically undertaken on an annual basis, the most recent being in January 2021. SGP has reviewed the inspection reports from February 2020 and January 2021 which both covered full inspections covering the processing plant and associated stockpiles and yard areas, haulage roads, stack monitoring reports, complaints, maintenance, and EMS documentation. In February 2020 the site was reported as being compliant with the majority of requirements although a number of non-compliance issues were raised. These have since been rectified. The January 2021 inspection similarly reports the site as being compliant with the majority of requirements, although notes a number of non-compliant issues with the fixed processing plant. Site management have advised SGP that these have since been, or are in the process of, being rectified.

[27] Rhondda Cynon Taf, letter to Hanson Quarry Products Europe Ltd, ref: PPC/009/617058, dated 11th July 2019

[28] Rhondda Cynon Taf, letter to Hanson Quarry Products Europe Ltd, ref: PPC/009, dated 22nd November 2016

11.4.7 Future Baseline Conditions

As noted above the current consent permits extraction, processing and mineral waste deposition activities until December 2022 with a further 12 months of sale and transportation of residual materials and 2 years for restoration. Thereafter all activities would cease on Site and the Site would not form a potential source of aerial emissions. The following assessment has therefore considered the potential impacts and resulting effects in the context of both a baseline of the existing quarrying activities and a baseline of no on-Site activities or transportation.

11.5 Assessment of Effects

11.5.1 General Observations

Airborne dust occurs when fine particles are disturbed and loosened by physical activity such as breaking, excavating, loading, tipping and transport, or by an airstream passing over such materials. Wind speeds greater than 10 knots (~5 m/s) across loose fine materials can cause windblown dust emissions.

Light winds will transport fine particles already suspended in the atmosphere due to disturbance. In calm conditions, any raised dust tends to settle out in the vicinity of the source. In windier conditions, the dust may be carried for a greater distance before settling out. The distance the dust will be carried depends on the wind speed, the particle size, the topography of the site and its surroundings.

Large dust particles, greater than 30 µm, which constitute the greatest proportion of dust emitted from mineral workings will largely deposit within 100m of the source. Finer particles, which constitute a small proportion of the dust emitted from most operations, are only deposited slowly, although their concentrations decrease rapidly from the source due to dispersion and dilution.

11.5.2 Principal Sources of Dust

The proposals encompass the on-going existing extraction, processing and restoration operations as detailed elsewhere in the ES. The quarry has reached its lateral extents and as such there will not be any further soil stripping, overburden extraction or bund formation.

The potential sources of airborne dust associated with the on-going quarrying and excavation operations will include:

- on-going soil and overburden storage;
- mineral extraction including drilling and blasting;
- loading and tipping;
- mineral processing, including crushing and screening;
- stockpiling of product;
- internal haulage;
- site access / road transport;
- backfilling of excavation voids;
- wind blow across bare ground and stockpiles.

Soil and Overburden Storage

Existing soil and overburden storage is sited at the north-western extremity of the void. These areas are well established and vegetated and as such will not provide sources of wind-blown dust.

Mineral Extraction

Mineral extraction operations consist of rock drilling and blasting. The large majority of drilling on the uppermost bench has largely been completed. All extraction activities will be undertaken within the existing void and as extraction progresses it will be located further within the void serving to increasingly contain any emissions.

The drilling rigs are modern self-propelled units and are equipped with cyclones and filtration systems to minimise dust emissions. The blasting operations are designed to minimise excessive breakage, fly rock, noise and

vibration and this will also reduce dust emissions. Any emissions from blasting will be short-lived and tend to be largely retained within the quarry void. Procedures are in place to condition sensitive areas with water from a bowser rain gun prior to blasting. Drilling and blasting are unlikely to result in significant dust emissions. Loading of the blasted rock results in localised dust emissions but these are retained within the quarry void.

Material Handling, Loading and Tipping

Loading and tipping of extracted mineral may result in localised dust emissions. Loading and tipping will occur when mineral materials are moved between haulage HGVs and plant for internal site transport and external road transport, when mineral is loaded into the processing plant and when mineral is placed in stockpiles after processing. Other than activities associated with the Primary Crusher, discussed further below, all loading and tipping would be undertaken, as currently, within the quarry void, serving to contain any emissions.

In addition, potential emissions would continue to be minimised through the use of standard techniques such as minimising drop heights and use of dust suppression on site when necessary, particularly during periods of prolonged dry weather.

Transport: Internal Movement

Internal site haulage is typically the greatest source of fugitive dust at quarries due to the physical disturbance of particles by vehicle movements over bare soil or loose surfaces. The potential impacts are increased over longer haul distances when vehicle speeds tend to be higher and more effort is required to maintain a smooth well-drained surface. Unsurfaced haul roads will increase the likelihood of fugitive dust emissions being raised.

The primary haul road is from the quarry void to the Primary Crusher feed hopper (referred to as Haulage Road C on the Permit). The current haul road runs below adjoining ground level and is screened by a rock wall and woodland to the northwest apart from a short section adjacent to the Primary Crusher where there is a screening bank about 2-3m in height with light tree cover.

A new haul route has recently been constructed between the extraction and processing areas following quarrying to create a corridor between the two areas. This serves to reduce the use of the haul road that runs from the lower level of the processing area to the Primary Crusher feed hopper (referred to as Haulage Road B on the Permit) and then to the main quarry via Haulage Road C. Haulage Road B is now therefore used primarily to enable vehicular access to the feed hopper and aggregates stockpiles to the east of the processing plant. As such the northern most section that runs closest to the site boundary is subject to limited traffic movement and much of the more frequented section between the yard area and stockpiles is provided with concrete surfacing. This is not therefore considered a likely significant potential source of dust.

A high standard of maintenance has been adopted on the main haul routes to minimise the generation of dust at the quarry. The internal haul roads generally either surfaced by sandstone bedrock or free-draining compacted gravel with little mud present. Continued maintenance of the internal haul roads, such as through limitation of vehicle speed limits, deployment of dust suppression when needed during prolonged dry conditions and maintenance of a smooth-running surface will therefore be important in minimising dust emissions.

The site currently employs a 10mph speed limit beyond the B4273. This speed limit would be retained and serves to reduce the raising of settle dust.

A high-capacity water bowser is used to dampen the roads surfaces when required. Fixed water sprays are installed to maintain damp surfaces on the haul road leading from the quarry void to the Primary Crusher. Water supply to these is provided off the mains supply.

Mineral Processing

Processing involves crushing, screening, and stockpiling of mineral before transportation offsite. The processing plant is controlled under the Environmental Permit as discussed above in Section 12.5.4, and therefore is required to be operated in accordance with best available techniques to prevent or reduce emissions.

The crushing and screening of hard rock such as sandstone can result in significant dust emissions and consequently the crushing and screening processes at Craig yr Hesg are fully enclosed within clad structures to provide generally effective containment of any emissions.

The Primary Crusher is located against the northern face of the oldest part of the quarry and is fed by a screen from the loading hopper at the top of the face. The primary crusher has linking conveyors to the secondary and tertiary crushers and screens to the south.

The Primary Crusher feed hopper is regarded as the most sensitive potential source for fugitive dust leaving the site. Significant improvement works have been undertaken here over the years to minimise the likelihood for the generation and release of dust from this source. Arrangements include the use of flexible curtains over the entrance to provide containment and use of mist spray systems to settle dust. The wagon turning area at the feed hopper is also fitted with fixed water sprays to prevent dust raising from the road surface. The sprays are activated via an automatic trigger and water supply is from a holding tank served by mains supply.

The use of water sprays at the screens and at transfer points reduces the amount of airborne dust. The external conveyors are fitted with covers and weather boards. The transfer points are generally shrouded and fitted with water sprays to contain and suppress dust. Fines and dust are conditioned with water prior to being returned to the quarry void and are therefore unlikely to give rise to airborne dust.

The secondary and tertiary crushers and screen house are located within the base of the void and are served by an air extraction and dust filtration system (bag house) that serves to further reduce any impacts. The system discharges to a single 18m stack which is continuously monitored to provide management of the bag filters. Stack emission limit values are specified in the permit for particulate matter and the stack is subject to annual monitoring to ensure compliance.

The ground level aggregate load-out point is open on two sides to permit access by HGVs, but is located in a sheltered position on the lower quarry floor. Transfer operations in this area may result in visible dust, but this is unlikely to travel to the site boundary. During dry conditions, further visible emissions may arise during operations at the adjacent aggregates stocking ground, although again this is in a sheltered location.

Roadstone Coating Plant (Asphalt Plant) (RCP)

The RCP was installed within the main processing area to the south of the secondary crusher at the base of the void in 2016. The operation of the RCP is also controlled under the Environmental Permit.

The operation of an asphalt plant can give rise to a range of emissions; the principal potential emission is of particulate matter from the stack although emissions can also arise of odours (from bitumen and reclaimed asphalt), Volatile Organic Compounds (VOCs; from bitumen fumes from tanks, drum mixer, loading station and handling of hot or reclaimed asphalt), combustion products (primarily nitrogen oxides from the drum and sulphur dioxide from the burners). The stack may also give rise to visible water vapour emissions. The associated activities, handling and storage of aggregate, filler, bitumen and fines can give rise to particulate matter emissions and odours.

The plant is connected to the processing plant by covered conveyors minimising the potential for any dust emissions that may occur during loading operations.

The plant is served by a stack of 17.5m. The system is similarly subject to continuous monitoring to provide management of the bag filters. Stack emission limit values are specified in the permit for particulate matter and the stack is subject to annual monitoring to ensure compliance.

Stockpiles and Exposed Surfaces

Following processing, the aggregates tend to be moist and, as a result, subsequent loading and tipping operations are unlikely to result in significant dust emissions except when the dried surfaces of stockpiled aggregates are disturbed. The stockpiles are contained in a sheltered position within the existing quarry, and significant dust releases from these are considered unlikely.

The dust / fine material stockpile is also located within the base of the quarry void minimising the likelihood of dust releases.

During dry windy conditions, visible wind blown dust may be raised from large areas of open or bare ground, including stripped and restored areas, stockpiles and other unsurfaced areas, particularly where the materials are loose or have been disturbed by traffic or other operations.

The principal such areas include the main void itself and the associated fines tip. The latter is located within the main void and as such any emissions are contained. If necessary though, and particularly during prolonged dry and windy conditions, the areas may be damped down to minimise dust generation.

Transport: Access Roads

Dust may be raised by road haulage due to spillage or wind blow from un-sheeted loads. Mud and materials may adhere to the wheels and underbodies of road vehicles travelling across unsurfaced and muddy ground on site. This may subsequently be deposited as track-out along the access road and circulation areas and potentially the B4273 on exiting the Site, and on drying, be raised as dust by the passage of vehicles.

Road transport accesses the site on fully surfaced roads which extend beyond the wheel wash and across the processing area. Vehicles accessing the aggregates stocking ground travel on compacted gravel surfaces. In general, the free-draining nature of the sandstone quarry and surfaces means that mud and silt track-out does not appear to be a significant concern.

Proposals include for the continuing use of the existing wheel wash which is provided with sprays and where all departing HGV traffic is cleaned. The road is fully tarmacked from the wheel wash to the B4273 and was observed to be in good condition.

All loaded aggregates lorries are sheeted to minimise the effects of wind-whipping.

Overall, through the incorporation of the in-design mitigation measures and standard control measures, road transport does not appear to result in significant dust emissions within or beyond the site boundaries.

Tipping / Backfilling of Excavated Voids and Restoration

Restoration will comprise the placement of quarry fines, soils and overburden on defined areas of quarry benches and on the floor of the quarry void. The majority of these works would be undertaken within the void and as such any emissions would be contained within the void. The potential for dust and air quality impacts is considered to be low, although the use of water conditioning to maintain the material in a damp condition during tipping and grading may be required.

Summary

The principal sources of dust are summarised below in below in Table 11-13; full details are provided in **Appendix 11-5**. Other than restoration all the described processes would occur throughout the duration of the works. However, they are all an extension of the existing consented activities at the Site for which existing dust mitigation measures are employed.

Table 11-13 Sources of Dust

SOURCE OF DUST	DUST SOURCE POTENTIAL	COMMENT
Mineral extraction	**small**: comprises blasting and drilling operations; drill rigs fitted with dust collecting equipment	typically contained within the void beneath surrounding land elevation; drilling operations complete at the upper bench level; screening increases and potential for dust blow decreases as excavations are deepened
Material handling / loading / tipping	**medium to small**: source potential decreasing where loading / tipping occurs at base of working face	short-lived and typically contained within the void at the base of faces
Internal haulage	**medium:** source potential can be significant if internal haul roads not adequately maintained and graded, particularly during prolonged dry periods; exposed surfaces on loads may produce dust; internal haul roads typically unsurfaced but comprise sandstone bedrock or compacted gravel	regular maintenance of surfaced and unsurfaced haul roads and smooth running surface required; damping down of haul road running surfaces may be required under dry conditions; fixed water sprays are in place on haul road to primary crusher feed hopper; majority of haul road below the surrounding ground level other than short stretch near primary crusher feed hopper; established speed limit in place
Mineral processing	**small to medium:** crushing and screening operations can give rise to significant dust emissions in the absence of appropriate mitigation; operations all enclosed within clad structures; located predominantly within the base of the quarry; ashpalt plant connected to procesing pant by covered conveyors minimising potential for any dust emissoins	additional dust suppressoin measures employed at the primary crusher feed hopper including mist sprays and flexible curtains; water sprays located at screens and transfer points; regular cleaning and maintenance of plant required
Stockpiles	**small:** stockpiles of varying product sizes; stockpiles located within quarry void; stockpiles can be managed to reduce wind-whipping	conditioning of stockpiles with water sprays may be required under dry windy conditions; clear demarcation of stockpile edges to prevent vehicles running over; surfaces may be damped down or have stabilisers applied if necessary
Exposed Surfaces	**small:** limited areas of freshly disturbed exposed surfaces across the site	predominantly located within void with limited near-surface exposed areas
Site access / road transport	**small:** wheelwash installed by site office; road provided with tarmac surfacing from highway access to weighbridge; source potential decreasing once vehicles have passed through wheelwash	site access road approximately 160m in length between wheelwash and public highway; road transport will be cleaned at the wheelwash prior to leaving site, and road surfaces will be maintained and cleaned as necessary

Restoration	**small:** restoration limited to the placement of quarry fines, soils and overburden on defined areas of quarry benches and on the floor of the quarry void; dust source potential dependant on weather conditions and material moisture conditions;	source potential decreases when tipping occurs in base of void

1: Dust Source Potential takes into account physical in-design mitigation measures, standard good practice management and control measures (as currently employed) and operation of the quarry in accordance with the existing planning permission conditions and Environmental Permit

2: Reference to The Environmental Effects of Dust from Surface Mineral Workings, Volume 1, Department of the Environment 1995

11.5.3 Dust Sensitive Receptors

Human and Ecological Receptors

The impact of dust at a receptor will depend on the inherent sensitivity of the receptor and the perception of the acceptability of the effects of dust.

A representative selection of potentially sensitive receptors that have been identified within the Study Area are detailed in Table 11-14 below and shown in Figure 11-6. The approximate distance of the receptors from the nearest potential dust sources are provided.

Other potentially sensitive receptors are effectively subsumed by the receptor locations identified below.

Figure 11-6 Dust Sensitive Receptors

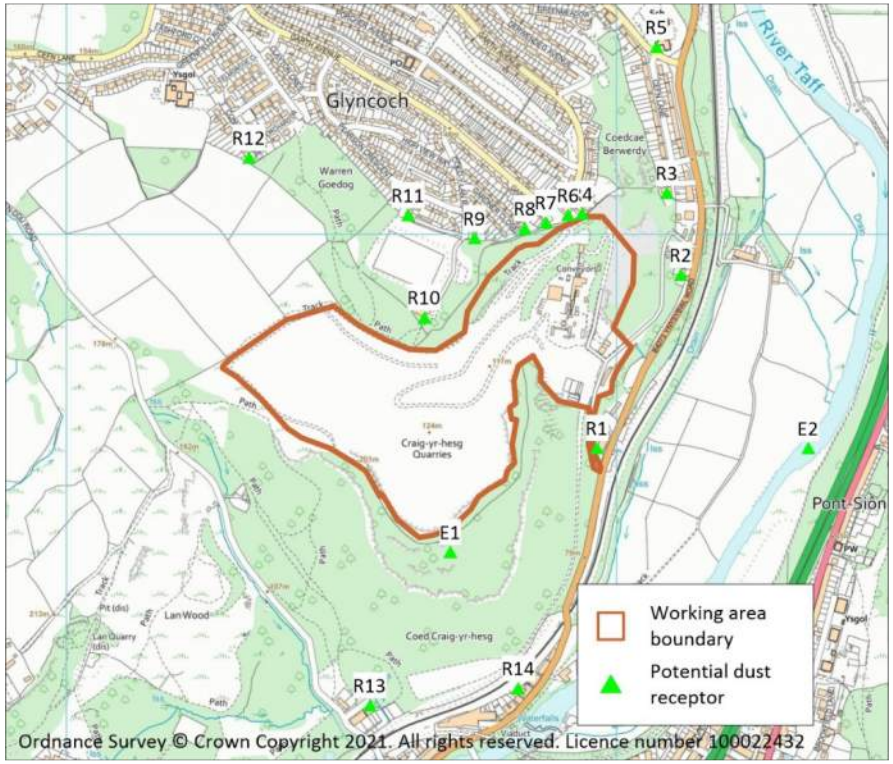


Table 11-14 Representative Potetentially Sensitive Receptors

Receptor ID	Location	Type	Nearest Potential Primary Source	Distance and Orientation From Source	Screening
Human Health Receptors					
R1	Rogart Terrace, Ynysbwl Road	residential	access road, stockpiles and yard	40m, ESE	effective – woodland
R2	Graig yr Hesg House, Ynysbwl Road	residential	processing plant	120m, E	effective - woodland
R3	Glyncoch Terrace, Cefn Lane	residential	primary crusher feed hopper	120m, NE	effective – woodland
R4	Old Peoples Flats, units 1-12, Garth Avenue	residential	primary crusher feed hopper	50m, NNW-N	partial
R5	Craig yr Hesg Primary School	school	primary crusher feed hopper	300m, NNE-N	effective – Glyncoch Estate
R6	Spar Supermarket, Garth Avenue	commercial / residential	haul road; primary crusher feed hopper	50m, NNW-N	partial
R7	Garth Avenue	residential	haul road; primary crusher feed hopper	45m, W-N	partial
R8	Gardner Close	residential	haul road; processing plant	55m, W-NW	effective - woodland
R9	Coed-y-Lan Road	residential	haul road; quarry void	120m, W-N	effective - woodland
R10	Club House, Rugby Football Ground	leisure	quarry void; haul road	90m, W-ENE	effective - woodland
R11	Pen-Bryn	residential	quarry void	225m, NNW-NW	effective - woodland

R12	Conway Close	residential	quarry void	305m, NNE-ENE	effective - woodland
R13	Darran Park, Daren Ddu Road	residential	quarry void	330m, S	effective - woodland
R14	106-128 Berw Road	residential	quarry void	325m, SE	effective - woodland
Ecological Receptors					
E1	Craig yr Hesg / Lan Wood	LNR / SINC	quarry void, processing and access road	adjacent to SW, S, SE and E	none at boundary
E2	Taff and Rhondda Rivers	SINC	processing and access road	270m E	effective - woodland

11.5.4 Dust Impact Assessment

The assessment takes into account the physical in-design mitigation measures. These include the heights and locations of mineral extraction, the locations of processing activities within the base of the quarry, the provision of dust suppression at the Primary Crusher feed hopper; the existing wheel wash and its continuing use, the provision of a water bowser, the surfaced access road from the highway to the weighbridge and the established speed limit of 10 mph within the Site.

In addition, the processing and directly associated activities are, and would continue to be, subject to control under an Environmental Permit which establishes controls on dust emissions. The associated requirements are taken to form in-design mitigation measures.

Other general requirements including road sweeping and vehicle sheeting in accordance with the existing planning controls and standard good practice will be continued. The incorporation of these measures at the Site as in-design measures has been assumed in the assessment; however, to provide more information they are also discussed in more detail in sub-section 11.7 below.

Taking into account the comments above in Table 11-10, and the in-design and management mitigation measures, the Dust Source Potential across the proposed operations is considered to be **small** to **medium** at most.

The probability of dust being carried towards the key potentially sensitive receptors (the 'pathway effectiveness') has been assessed through reference to the site measured wind data, the distance and orientation of the receptors to the Site and individual sources of dust, and the presence of screening. In practice, the probability of winds carrying dust may be reduced outside the summer months, when rainfall can be typically expected to suppress fugitive dust emissions over more than one third of the time. The potential pathway effectiveness has also taken into account the local terrain and topography and in-design mitigation measures.

Disamenity Dust Effects

Full assessment details are provided in **Appendix 11.5** and are summarised as follows:

Table 11-15 Summary of Estimated Risk of Disamenity Dust Impacts and Effects

ID	Primary Source Dust Potential	Residual Pathway Effectiveness	Receptor Sensitivity	Risk of Impacts	Potential Effect
R1	small	highly effective	high	negligible	negligible
R2	medium	ineffective	high	negligible	negligible
R3	medium	ineffective	high	negligible	negligible
R4	medium	moderately effective	high	low / negligible	slight / negligible
R5	medium	ineffective	high	negligible	negligible
R6	medium	slightly effective	high	negligible	negligible
R7	medium	slightly effective	high	negligible	negligible
R10	medium	slightly effective	low	negligible	negligible
R11	medium	ineffective	high	negligible	negligible
R12	medium	ineffective	high	negligible	negligible
R13	medium	ineffective	high	negligible	negligible
R14	medium	ineffective	high	negligible	negligible

1: Dust Source Potential dependant on the nearby principal sources to each receptor

The above summaries the maximum resulting risk of impacts and potential effects at each receptor across the different site activities and sources assessed for that receptor.

At residential and other highly sensitive receptors the likely disamenity dust effects are predicted to be *negligible* at the majority of receptors to *slight adverse* at most at the old peoples' flats and adjoining residential properties.

Glyncoch Estate

The southern fringe of the estate, near Garth Avenue, extends to within 12m of the northern flank of the quarry haul road and 50m of the loading hopper to the primary crusher. Receptors in this area include old peoples' flats, residential properties and a supermarket with apparent 1st floor residential use. The latest wind data shows a strong southerly influence, although the trees and low bund in this area provides some screening. Given the proximity of these sensitive land uses in this area particular emphasis has been placed upon the deployment of dust controls in this part of the quarry with considerable improvements made over the past 10 years. The on-going implementation of these measures and strict management and control substantially reduces the potential source term here. However, given the reliance on these measures it is considered appropriate to refer to this as a medium source, resulting in a low risk of dust impacts and resulting potential *slight adverse* disamenity dust effects.

Other parts of Glyncoch, including the primary school located to the north, are sufficiently remote to be unlikely to be affected by uncontrolled releases of dust from the site. The risks for these receptors reduce to *negligible*.

Properties along Ynysbwl Road

The hillside between the properties along Ynysbwl Road and sources is heavily wooded and screening of dust is likely to be effective. At distances of between 100m and 200m the potential risks of dust impacts and effects with the implementation of the existing dust control measures are *negligible*.

Other areas

The sparsely settled areas to the west and south of the site are very well screened by mature woodland and are remote from the site. No significant impacts and resulting effects are predicted for residential and other receptors in these directions.

In summary, taking account of the designed-in mitigation measures, there is a risk of *slight adverse* effects, at most, arising from fugitive dust at the nearby residential receptors.

The overall significance with regards to disamenity dust is considered **not significant.**

The assessment above considers the effects of the activities within the site on the identified receptors. Potential effects associated with track-out arising from road transport as summarised separately below.

Ecological Effects Assessment

The results of the assessment with regards to potential dust soiling effects at the nearby ecological receptors are provided in **Appendix 11.5** and are summarised below in Table 11.16.

This assessment takes into account the designation of the nature conservation sites to initially define the sensitivity of the receptor. As for disamenity dust the assessment considers the effects of the activities within the Site. Potential effects associated with track-out arising from road transport as summarised separately below in sub-section 'Track-Out'.

Sandstone quarry mineral dust emissions are inert and chemically unreactive and pose little risk to the natural flora and fauna surrounding the site. High deposition rates may however cause soiling of leaf surfaces and a reduction in photosynthesis.

The Craig yr Hesg / Lan Wood LNR / SINC, an extensive area of ancient semi-natural woodland, wraps around the southern perimeter of the Site. As

discussed above however the majority of the potential dust generating activities are located within the quarry void and the SINC is distant from the Primary Crusher feed hopper in the north. The woodland would be classed as a low sensitivity receptor and resulting potential effects due to dust are *negligible*.

The Taff and Rhondda Rivers SNIC is distant from the site and fully screened by woodland with resulting *negligible* potential effects.

Table 11-16 Summary of Estimated Risk of Dust Accumulation Impacts and Effects

ID	Source Potential	Pathway Effectiveness	Receptor Sensitivity	Risk of Impacts	Potential Effect
E1	medium	slightly effective	low	low	negligible
E2	medium	ineffective	low	negligible	negligible

The overall significance with regards to dust deposition and ecological receptors is **not significant**.

Track-out

With reference to the IAQM guidance with regards to construction dust and track-out21, assessment has been made with regards to the presence of any receptors for a distance of 50m from the highway up to 500m from the site access.

All HGVs leaving the Site pass through the wheel wash, which is taken as the 'exit point' for the purposes of the trackout assessment. The internal access road from the wheel wash to the junction with the B4273 is about 160m and is fully provided with tarmac surfacing. Departing HGVs movements are an average of 58-70 per working day (as detailed below in Section 11.5.3). Given the presence of the wheel wash (which is provided with sprays and timer system) the residual source potential for trackout is considered to be *medium* at most.

The only receptors within 50m of 500m road from the wheel wash are those on Rogart Terrace at the access road / B4273 junction. The resulting risk of any dust effects arising from track-out onto the main highway is *negligible* if the existing dust management arrangements are maintained.

The results of the risk assessment are summarised below in Table 12-11.

Table 11-17 Summary of Track-Out Effects

	Source Potential	Area Sensitivity	Potential Effects
Dust Soiling	medium	low *(1-10 properties within 50m of potentially affected highway)*	low
Ecological	medium	low *(one local wildlife site within 50m of potentially affected highway)*	low

The overall significance with regards to track-out is **not significant**.

The above dust impact assessment considers the potential for adverse impacts due to fugitive dust arising during an extended period of quarrying operations against a baseline of no on-site activities, as would be the case if quarrying were to cease at the end of 2022. As set out in Section 11.4 the assessment has considered the potential impacts and resulting effects in the context of both a baseline of no on-Site activities or transportation and a baseline of the existing Quarry activities. . When considered in the alternative against a baseline of the existing site activities there would be no materially different potential sources of dust to those currently existing, and hence no potential additional impacts to those currently experienced.

11.5.5 Suspended Particulate Matter

PM_{10} will make up a small proportion of any emitted dust. Although PM_{10} may travel distances of 1,000m or more, concentrations decrease rapidly on moving away from a source due to dispersion and dilution. Concentrations are expected to return to background concentrations within 400m of a surface mineral source. Given the proximity of residential properties to the Site further consideration has however been made of potential impacts associated with PM_{10}.

Current Defra guidance[29] in relation to the updating and screening process under the LAQM regime with regards to fugitive and uncontrolled particulate matter releases, including those from quarries, advises that, where the background annual mean PM_{10} concentrations are less than 28 µg/m^3, only receptors within 200m of a source should be considered.

The IAQM guidance[20] with regards to mineral sites and planning advises that where existing background ambient PM_{10} concentrations are less than 17 µg/m^3 there is little risk that additional contributions from mineral operations would lead to an exceedance of the long-term AQAL. Defra predicted background annual mean PM_{10} concentrations for the general locality are in the range of 11.53-12.05 µg/m^3 for 2020 (see Table 11-6), well below 17 µg/m^3.

It is therefore concluded that the Proposed Development would not result in significant adverse impacts on local air quality due to long term PM_{10} emissions. This is consistent with the RCT monitored data for Upper Garth Avenue where the annual mean PM_{10} concentrations have been consistently well below the AQO for 2015-2019 being in the range 13.45-25.1 µg/m^3.

The IAQM guidance notes that there may be a number of days per year with particularly intense operations which increase the number of days with a concentration greater than 50 µg/m^3 but do not have a significant impact on annual mean concentrations. The IAQM however recommends the focus in assessments should be on the annual mean objective in light of the absence of data on short term process contributions. However, extensive data is also now available from the on-site and RCT Upper Garth Avenue monitoring to inform assessment of potential short-term impacts.

Occasional exceedances of the short-term limit value of 50 µg/m^3 have been recorded at Upper Garth Avenue, to which it is possible the quarry is a contributary source. However, the number of days per year the exceedances have been recorded are well below the AQO of 35 days per annum, in the range 2 to 13 between 2015 and 2019.

To further inform the assessment the extensive additional Garth Avenue PM_{10} monitoring data has also been reviewed to estimate the potential contributions to total concentrations from the quarry.

Calculations have been made comparing the results obtained from Monday to Saturday (the quarry being consented to operate between the hours of 07.00 to 19.00 Monday to Friday and 07.00 to 16.00 on Saturdays) to those obtained for Sundays (when the quarry is not operational). In accordance with Defra LAQM guidance[14] days where <75% data capture was obtained for a 24-hour period, these periods have been removed from the calculations.

The average hourly PM_{10} concentrations recorded across Mondays to Saturdays and across Sundays for each year the period 2015-2020 are provided below.

[29] Defra, Local Air Quality Management, Technical Guidance (TG16), February 2018

Table 11-18: Average PM_{10} concentrations across period at RCT Garth Avenue Monitoring Location[1]

Year	Mondays-Saturdays	Sundays	Difference	Comment
	µg/m³			
2015	18.27	14.27	4.00	
2016	14.06	9.74	4.32	
2017	16.75	10.41	6.34	
2018	*7.35*	*6.48*	*0.87*	*<75% data capture for period*
2019	*15.19*	*9.95*	*5.24*	*<75% data capture for period*
2020	14.89	11.66	3.23	Covers period of COVID-19 pandemic
average	**15.99**	**11.52**	**4.47**	Discounting 2018 & 2019

1: Calculations exclude any 24-hour periods where data capture <75%

The differences between Monday to Saturdays compared to Sundays across the period were 3.23 µg/m³ to 6.34 µg/m³ (discounting 2018 and 2019 for which low data capture was recorded) with an overall average difference of 4.47 µg/m³. This is the maximum possible average contribution to PM_{10} from the quarry recorded at the monitoring location, with other sources such as road transport and wider industry also likely to be reduced on Sundays. Of particular note is the difference recorded in 2020, which includes the period of the COVID-19 pandemic[30] was reduced at 3.23 µg/m³. The site itself continued operating throughout this period other than the loss of one day. The reduced difference could therefore be an indication of the reductions in contributions to background PM_{10} concentrations from other sources such as transport emissions.

Based on these results it is reasonable to assume a possible average increase of 4.5 µg/m³ to PM_{10} concentrations for the closest receptors to the site.

Reference can be made to the significance assessment matrix for assessing potential impacts at individual receptors provided in the IAQM guidance[31] has as reproduced in Table 4-11.

Table 11-19: Impact Descriptor for Individual receptors[1]

Concentration at receptor[2]	% Change in concentration relative to Air Quality Assessment Level (AQAL)[3]			
	1	2-5	6-10	>10
75% or less of AQAL	negligible	negligible	slight	moderate
76-94% of AQAL	negligible	slight	moderate	moderate
95-102% of AQAL	slight	moderate	moderate	substantial

[30] COVID-19: Following the outbreak of a global pandemic of the Coronavirus disease 2019 (COVID-19) due to the SAR-CoV-2 virus, the UK Government declared several restrictions on non-essential travel and movements during March 2020. These restrictions continued to varying extents across 2020 with resulting implications on road traffic, industry, general activity and hence emissions of ambient air pollutants.

[31] IAQM Land-Use Planning & Development Control: planning for Air quality, 2017, v1.2

103-109% of AQAL	moderate	moderate	substantial	substantial
110% or more of AQAL	moderate	substantial	substantial	substantial

1: Reproduced from Table 6.3 in IAQM guidance; see reference document for full footnotes and explanations

The predicted impacts on receptors from PM_{10} from the existing quarry operations are set out below in Table 4-12.

Table 11-20: Assessment of Potential Significance of PM_{10} from Quarrying

Impact Area	Background Conc.	Increase	Predicted Conc.	Impact Descriptor
housing, shop and fast food outlet within 200m of existing quarry operations	11.53 (LAQM map for 2021)[1]	+4.5 (11% of AQO)	16.03	moderate
		+3.23 (8% of AQO)	14.76	slight

1: The Defra predicted background PM_{10} concentration for 2021 is 11.53 µg/m^3. The average measured PM_{10} concentration at Garth Avenue, excluding Sundays , is 11.52 µg/m^3.

A possible contribution of 4.47 µg/m^3 to the annual mean concentrations at the closest part of Garth Avenue therefore represents 11% of the long-term AQO. Resulting total PM_{10} concentrations have remained well below the AQO (<75%). When compared to a baseline of 'no existing quarry activities' the possible impact descriptor at the nearest receptors could therefore be described as *moderate adverse*.

As noted above however this is the estimated maximum average increase, and other possible weekday sources have not been excluded from this calculation. A possible contribution of 3.23 µg/m^3, as noted for 2020, would be 8% of the AQO, resulting in potentially *slight adverse* impacts.

Potential contributions would be reduced further away from the quarry with resulting *negligible* impacts.

On this basis, it is concluded that the Proposed Development would not result in significant adverse impacts on local air quality due to PM_{10} emissions, subject to the retention of the existing measures taken to manage fugitive dust, and hence also PM_{10}, emissions.

The overall significance with regards to PM_{10} is **not significant**.

When considered in the alternative against a baseline of continuation of the existing site activities for an additional period of time there are no materially different potential sources of PM_{10} to currently, and hence no potential additional impacts to currently.

11.5.6 On-Road Vehicle Emissions Assessment

No increases to existing quarry related HGV movements are proposed as part of this application.

Based on an average output of 400,000 tonnes per annum and an actual average payload of 24 tonnes, current operations at the quarry give rise to an average of 58 loads (116 movements) *per working day* as detailed in Chapter 12: Transportation. If a 20 tonne payload is assumed for a more conservative assessment, (as was the case for the 2015 quarry extension application), this

results in an average of 70 loads (140 movements) per working day. This is based on 5.75 working days per week, which following exclusion of public holidays and planned shut-downs, results in 287.5 working days per annum. On averaging out across a full year of 365 days this equates to either 91 (assuming 24 tonnes payloads) or 110 (assuming 20 tonnes payloads) annual average daily movements.

Almost all HGVs travelling to / from the Site do so via the B4273 to the south and Bridge Street / Ceridwen Terrace to / from the A470. Thereafter the majority distribute towards the south.

With reference to Figure 11-3, all existing HGV movements are therefore through a short stretch of the Pontypridd Town Centre AQMA. These movements are above the IAQM threshold of +25 annual average daily traffic (AADT) movements for HGVs that would indicate the need for an air quality assessment for a new development.

It is noted however that these movements are already experienced on the local road network, and there would not be any increase arising from the proposals. Furthermore, as noted by the RCT 2020 ASR, monitored annual mean NO_2 concentrations within the AQMA have been observed to be falling, with the result that reduction of the size of the AQMA is being considered. Although the short stretch of AQMA through which the Site-related HGV movements travel would remain there is no indication that this is associated with HGV movements in the area. The RCT reports note that the characteristics deemed of importance to the Pontypridd Town Centre AQMA and that may have a cause in, or exacerbate, the need for the AQMA is the traffic volume and buses, a bus station being on the nearby Morgan Street and multi-storey car park between Morgan Street and the B4273.

The only stretch of road along which the Site-related HGVs travel for which NO_2 monitoring data is available is Ceridwen Terrace (monitoring ref: 83). There is no NO_2 monitoring data for the B4273 / Bridge Street junction. Annual mean NO_2 concentrations at Ceridwen Terrace have remained well below the long-term AQO since 2016 at 31.5-34.8 µg/m^3 and this area is not located within the AQMA.

Additional information provided in Chapter 12: Transportation states that traffic counts undertaken on the A4273 Berw Road have shown HGVs to be present in the range 2.8-7.5% of the total vehicle flows on this highway (different %'s calculated for different surveys and across 3 day to 7 day survey periods). The Site related HGV flows are in the range 13.7%-23% of the total HGV flows, and hence 0.3-1.7% of the total vehicle flows. With reference to Defra guidance provided in relation to the LAQM assessment regime[3] a road of >2,500 HDVs (Heavy Duty Vehicles including buses and coaches) per day would be considered a 'road with a high flow of HDVs' requiring assessment. The A4273 does not therefore form a road that would be considered a road with a high flow of HDVs and the quarry HGV traffic forms only a small percentage of the total flows. The % of quarry related HGV flows compared to total traffic on Bridge Street would be further reduced. On this basis it is considered that the contribution of existing quarry related HGV exhaust emissions to the local air quality is not significant. This is consistent with the fact that assessment of HGV emissions was not required by RCT in relation to the Western Extension planning application.

Furthermore, on the basis that there would not be any increases in existing HGV movements due to the Proposed Development, it is not considered the proposals would have any influence of the proposed amendment to the Pontypridd Town Centre AQMA.

The overall effect of quarry vehicle emissions on local air quality during an extended period of operations at the quarry, whether considered against a baseline of no Site related transportation or a baseline of existing Site related transportation, is deemed **not significant.**

11.6 Mitigation

11.6.1 Dust Soiling and Accumulation

The above assessment takes into account the in-design mitigation measures where these encompass both physical measures and measures required under the existing planning permission (Condition 30) and Environmental Permit that are to be retained. Physical measures are taken to include the

location of the majority of the processing area within the quarry void and the length of the surfaced access road prior to highway access.

Summary details of these existing measures are provided below to provide clarification.

The excavation of mineral and related operations will continue to be conducted in accordance with best practice guidance[10,32] and with the Hanson Environmental Management System. The essence of the guidance is that dust emissions can be controlled through effective site management. Responsibility for ensuring compliance with the requirements, and that disamenity, nuisance and other hazards arising from the Site due to dust emissions do not occur, would lie with the Site Manager.

Of particular note, the processing activities, including operation of the RCP, are, and would continue to be, controlled under a site-specific Environmental Permit. Summary details of the requirements of the existing permit and planning permission are provided below to provide clarification.

As an over-riding requirement, the Environmental Permit requires that there should not be any significant or persistent emissions of visible particulate matter arising from certain specified elements of the regulated facility. In addition, the Permit requires that there should not be any visible emission of particulate matter, mist or fume, other than condensed water vapour, observed crossing the facility boundary, or emitted from the crushing and screen plant stack exhaust or RCP stack exhaust.

Other requirements / measures included in the planning consent and / or Permit include:

- use of best practicable means to restrict the generation of dust on the haul roads and access road, including watering during dry weather;
- regular compaction, grading and maintenance of on-site non-metalled roads used as a consequence of quarrying operations;
- product and waste stockpiles to be watered as and when necessary to minimise the suspension of dust;
- maintenance of existing vegetation on northern site boundary unless a suitable screening replacement is approved;
- maintenance of an automatic weather station at the primary crusher;
- all site traffic to be kept to the designated haul routes;
- provision of a water bowser to be deployed within the quarry and on access roads as required;
- weekly cleaning / sweeping of the public highway used to access the site;
- use of dust collecting equipment on drilling rigs;
- enforcement of an internal roads speed limit (10mph);
- fitting of site vehicles with upswept exhausts and radiator fan shields;
- minimisation of drop heights at loading and discharge points;
- clearance of product or waste spillages to avoid accumulations;
- implementation of measures to ensure that mud and detritus do not accumulate on the public highway;
- cleaning of wheels of all lorries leaving the site before entering the public highway and securing and covering of loads;
- avoidance of soil reinstatement, and overburden handling, operations during dry and windy conditions.

Standard good practice measures that would continue to be employed on site to achieve these requirements include:

- regular compaction, grading and maintenance of internal haul roads, including maintenance of a smooth running surface, regular sweeping and cleaning of site access road;
- avoiding abrupt changes in horizontal and vertical alignment;

[32] Department of the Environment, Mineral Division, The Environmental Effects of Dust from Surface Mineral Workings, Volumes 1 and 2, December 1995

- maintenance of high standards of house-keeping to minimise track-out and wind blow dust including clearance of structures of accumulations of loose dry material;
- a preventative maintenance programme, including readily available spares, to ensure the efficient operation of plant and equipment, including fixed and mobile dust suppression plant;
- use of clean water clean water for dust suppression, to avoid re-circulating fine material;
- dust suppression by regular spraying by pressurised bowser, in dry conditions;
- maintenance of adequate year-round water supply (site has access to mains water which is protected from frost); and
- clear delineation of stockpiles.

In addition, the further mitigation measures at, and on the haul road to, the Primary Crusher feed hopper, will be retained and maintained, including the fixed spray lines.

In that regard, particular efforts have been maintained to minimise the generation of dust in and near the Primary Crusher feed hopper and associated haul road. The sensitivity of the land uses to the immediate north of the Primary Crusher feed hopper have historically been identified, and extensive improvement works have been undertaken, including the implementation of a PM_{10} Emissions Action Plan (2009). These improvements have continued with the installation of additional sprays at the feed hopper and along the haul road and provision on an automatic system.

In addition, condition 31 of the ROMP schedule of conditions requires that prior to the commencement of any alternative means of access from the plant area to the primary crusher, a scheme shall be submitted to the LPA for additional dust minimisation measures along the site boundary in the vicinity of the primary crusher.

In practice, whilst there is now an alternative means of access from the plant area to the main quarry operational area, the access from the quarry to the primary crusher is largely unchanged. Nevertheless, Hanson are happy to adhere to the spirit of this condition and have proposed a scheme of additional planting along the site boundary north of the primary crusher designed to further control fugitive dust. The scheme is produced as **Appendix 11.6**.

Extensive additional measures are specified in the Environmental Permit specific to the processing activities. These include, but are not limited to:

- specified emission limits provided for the mineral crushing and screening plant and RCP stack exhausts and requirements for annual monitoring to determine compliance;
- visual assessment of emissions to air should be undertaken at least once a day of certain aspects of the facility;
- requirements in relation to the air pollution abatement plant;
- requirements in relation to containment and sealing of various plant, buildings and conveyors;
- requirements in relation to tanks, silos and internal storage relating to the RCP;
- control of stockpiles, loading and unloading;
- control of transport;
- management controls.

The Site Manager, or delegated trained personnel, carry out, and would continue to carry out, daily inspections and log observations of site conditions, including any occurrences of dust or the onset of potentially dusty conditions.

The Quarry Manager would continue to record all dust and air quality complaints, identify causes, take appropriate measures to reduce emissions in a timely manner, and record the measures taken. The complaints and activities log will be maintained and made available to RCT if requested.

In addition, a scheme for additional dust mitigation measures and enhanced screening along the site boundary near the vicinity of the Primary Crusher feed hopper is to be submitted to RCT in relation to Condition 31 of the existing planning permission.

A Dust and Particulate Management Plan and Dust Monitoring Plan[33] (referred to hereafter as a DMP) was submitted to RCT in relation to the Western Extension proposals. This document sought to draw together the management and monitoring measures that were to be implemented specifically in relation to fugitive nuisance dust taking into account the existing planning permission (Condition 30) and Permit controls discussed above. It is proposed that a similar DMP would be drawn together for the continuation of the existing activities that are subject to this planning application, and that would be subject to agreement with RCT, and a draft is provided in **Appendix 11-7**.

11.6.2 PM_{10} Emissions

The mitigation of PM_{10} emissions will be achieved primarily by the means of the standard mitigation measures for general dust along with the site-specific additional measures employed under the Permit in relation to the processing plant outlined above. Additional mitigation measures with respect to PM_{10} are not deemed necessary.

11.6.3 Other Processing Plant Emissions

Additional mitigation measures are specified in the Environmental Permit in relation to the operation of the RCP including the specification of sulphur content of fuel to be used. The Permit includes a standard odour boundary condition requiring the absence of any offensive odour beyond the facility boundary unless it can be shown the operator has taken all reasonable steps to prevent the release of offensive odour. The Permit also requires olfactory assessments to be made once a day during operation of the RCP.

11.6.4 On-Road Vehicle Emissions

The Proposed Development would not result in the generation of additional vehicle movements to those experienced currently. No additional mitigation has been identified as being required in relation to on-road vehicle exhaust emissions.

11.6.5 Monitoring

The current programme of visual monitoring would be continued.

Monitoring for PM_{10} has continued at the site since establishment in 2009. In discussions with RCT relating to the Western Extension proposals, to avoid duplication of the monitoring undertaken by RCT which utilises a reference PM_{10} monitor, it was agreed that Hanson would cease on-site monitoring and contribute towards the costs of the RCT monitoring, subject to incorporation of the issues in a formal legal agreement[18]. It is proposed this approach is also adopted with regards to these proposals for the continuation of existing activities with a view to ceasing the on-site PM_{10} monitoring.

It is understood that it is the intention of RCT to continue their existing programme of air quality (PM10) monitoring via the station at Garth Avenue. Consistent with the position with regard to the proposed western extension development, Hanson will make a similar offer to make a contribution towards the cost of the ongoing monitoring, subject to there being no requirement for Hanson to undertake parallel monitoring and for a review of the necessity for ongoing monitoring by RCT depending on the reported annual results.

These issues would be incorporated into a formal legal agreement, where the air quality monitoring by RCT would then be undertaken in conjunction with the dust and particulate management proposals set out in this Plan.

[33] Hanson UK: Craig yr Hesg Quarry, Dust and Particulate Management Plan and Dust Monitoring Plan, dated 16.08.2017; submitted to H. Winsall, Principal Planning officer, RCT, with letter ref: 407.00027.00386, 16th August 2017

There has been no requirement for nuisance dust monitoring around the site to date as part of the existing planning permission. However, as part of the DMP submitted in relation to the Western Extension proposals, a scheme was included for fugitive dust monitoring. As noted in section 11.4.2 above, a temporary period of fugitive dust monitoring has also been commenced as part of the current assessments to inform the existing baseline situation. The results to date are provided in **Appendix 11.4**.

Measured dust deposition rates across the March to April 2021 period are all within the ranges previously measured and reported in 2014. This is consistent with expectations that there are no particular changes of note in the locality that would lead to an expectation that background dust deposition rates would have changed substantially since the previous monitoring. Subject to this preliminary conclusion being verified by results over the 3 month monitoring period, further dust deposition monitoring will not be considered to be necessary for the requested extended period of operations.

The site weather station will be maintained and records kept; these may be referred to and assist in the investigation of complaints or records of elevated disamenity dust or PM_{10} levels to help determine or eliminate sources.

11.7 Residual Effects

The on-going maintenance of the existing standard and site-specific enhanced management and control arrangements is considered to provide effective control against the potential impacts of airborne dust and suspended particulate matter.

The proximity of the Primary Crusher feed hopper and haul road areas to the nearest receptors to the north inevitably means that there will remain a small risk of disamenity dust in the event of prolonged dry conditions and strong winds, although the mitigation measures outlined above are expected to continue to minimise any impacts and resulting effects.

Maintenance of daily observations and inspections by the site management are therefore required in order to minimise these risks, along with rapid rectification of any malfunctions or damage that may occur to dust suppression equipment.

The resulting significance of disamenity, health (PM_{10}) and ecological effects resulting from fugitive dust is **not significant**.

The overall significance of the Proposed Development with regards to air quality effects is **not significant**.

Table 11-21 Summary of Residual Effects (with mitigation)

Source	Dust Effects			Vehicle Emissions
	Disamenity	Health (PM_{10})	Ecological	
Proposed Development	slight adverse	negligible	negligible	negligible
Significance	not significant	not significant	not significant	not significant
Overall Significance	**not significant**			

11.8 Summary and Conclusions

Proposals are for the continuation of existing operations at Craig yr Hesg Quarry. There are no proposed changes to the current consented scheme or rate of working or output from the Site and as such there would not be any changes to the current processing activities, hours of operation, internal haulage or transport movements.

The air quality assessment has therefore considered the potential local air quality impacts in the context of the extant planning permission and implications of continuation of the existing activities.

The principal aspects considered in the air quality assessment are mineral dust emissions where this refers to disamenity dust and suspended particulate matter (PM_{10}) arising from extraction, processing and subsequent restoration. Consideration has also been HGV exhaust emissions (nitrogen oxides (NO_x) and suspended particulate matter) from vehicles travelling to and from the site.

The principal sources of dust and particulate matter are likely to be internal site haulage, extraction, processing, tipping and loading operations and wind blow across bare and disturbed surfaces. The majority of these operations however occur, and would continue to occur, within the existing void serving to provide containment to any such emissions.

The proximity of the northern part of the site which houses the Primary Crusher feed hopper and associated haul road to sensitive land uses has historically been identified and extensive improvement works have been incorporated over the years to minimise the likelihood of particulate matter emissions in this area. This has included the implementation of several site-specific enhanced mitigation measures above and beyond standard measures. This includes the provision of dust suppression water sprays at the feed hopper and along the haul road accessing the hopper, with water supply being provided via a mains supply, and provision of a flexible curtain to the hopper.

Other standard mitigation measures are employed across the site such as the use of a water bowser to enable dust suppression on the haul routes, maintenance of speed limits and smooth-running surfaces on haul roads, and minimisation of drop heights.

The site activities will continue to be operated in accordance with the existing dust controls as specified under the extant planning permissions, along with the additional controls imposed under the Environmental Permit covering the processing operations. This includes the requirement for no visible dust emissions from the processing activities beyond the site boundary.

The above measures serve to minimise both potential disamenity impacts due to fugitive dust and human health impacts due to PM_{10}. Monitoring for PM_{10} has been undertaken both on-site by Hanson and within the Glyncoch Estate by RCT, the RCT methodology employing an EU reference method enabling direct comparison with the UK air quality objectives. The data indicates no actual or likely breach of either the long-term annual mean or short-term 24-hour AQOs for PM_{10}.

The existing site wide fugitive dust mitigation measures are detailed within Condition 30 of the extant planning permission. It is proposed a Dust and Particulate Management Plan and Dust Monitoring Plan (DMP) is agreed with RCT which would draw together these existing mitigation and management measures taking into account the existing planning permission and Permit controls for the continuation of the existing activities which is the subject ~~to~~ of this planning application. This would include a scheme in relation to fugitive dust monitoring. Separately Hanson proposes to cease on-Site PM_{10} monitoring and contribute towards the costs of the RCT monitoring, subject to incorporation of the issues in a formal legal agreement.

Overall, with the on-going application of standard good practice measures, along with the additional site-specific enhanced measures, the residual risk of adverse effects due to disamenity dust is *slight adverse* at most at all receptors. Daily inspections and observations, along with rapid rectification of any identified equipment malfunctions, would be continued to minimise these risks. The resulting significance of disamenity resulting from fugitive dust is **not significant**.

Similarly, on the basis of the PM10 monitoring data and subject to on-going maintenance of the existing mitigation measures taken to manage fugitive dust, it is concluded that the Proposed Development would not result in significant adverse impacts on local air quality due to PM_{10} emissions. The overall significance with regards to PM_{10} is **not significant**.

The Proposed Development would not result in the generation of additional vehicle movements on the local road network to those experienced currently. Potential adverse impacts and effects at receptors due to vehicle movements

on the local highway would be *negligible*. The significance of residual effects associated with vehicle exhaust emissions would be **not significant**.

The overall significance of the Proposed Development with regards to air quality effects is **not significant**.

Accordingly, it is concluded that the proposed development is acceptable in terms of air quality and dis-amenity dust considerations.

12.0 TRANSPORTATION

12.1 Introduction

This Chapter of the ES has been prepared by the Hurlstone Partnership, and considers the traffic effects associated with the proposal to extend the life of the existing quarry and the duration of traffic movements associated with it.

Chapter 1.0 of the ES sets out the planning history of Craig yr Hesg Quarry and confirms the extant planning permissions under which activities may currently take place. The quarrying activities at the site were subject to a ROMP application, which was determined on 24 April 2013 and included 49 planning conditions (ref 08/1380/10).

The schedule of planning conditions imposes an end date for extraction and processing of materials of 31st December 2022, with a further 12 month period to dispose of processed material. There are no restrictions on output or the number of vehicle movements beyond those imposed by the approved operating hours.

In addition to the ROMP Review updated schedule of planning conditions (08/1380/10), a permitted development approval of details was issued in November 2013 for the construction of a new asphalt plant (13/0825/23). This permitted a new asphalt plant to be constructed within the site, which was effectively a replacement for the old plant that was decommissioned in 2009. An additional planning permission was issued in March 2014 for the improvement of the quarry access (ref 13/1039/10).

In terms of highway and transport issues, the proposed development simply seeks to extend the end date for the permitted operations for 6 years followed by the existing one-year allowance for transportation of remaining residual stocks of processed material.

Other than the extension of the deadline for the cessation of activities, the proposal will result in no material change when compared with the existing situation in terms of output or associated traffic movements, noting that the average recent and historic annual production has been approximately 400,000 tonnes per annum.

The mineral reserves at the site are considered to be a nationally important product due to their suitability for the production of skid resistant road surfacing.

The implicit acceptability of the continuation of traffic movements associated with Craig yr Hesg Quarry has recently been confirmed via a planning application (ref 15/0666/10) for a western extension to the site, which was proposed to maintain supplies for some 25 years. The application was refused on 23 July 2020 on the grounds that quarrying operations would take place within 200m of sensitive properties without sufficient justification, but the refusal did not relate to highways impacts.

12.2 Site Access

Historically, the Quarry used two access points to the B4273 Ynysybwl Road / Berw Road, in locations approximately 440m apart. The B4273 is subject to a 40 mph speed limit in the vicinity of the site and has street lighting with a pedestrian footway along its western side.

The southern connection formed the main site access for all vehicles and also the egress for light vehicles. The northern connection served as the egress for HGV traffic leaving the site.

However, planning permission (13/1039/10) was issued on 14 March 2014 to improve the southern access to provide for two-way HGV traffic. The access improvements have been completed and all traffic now uses the southern access, which is subject to a 10 mph speed limit, although the northern access remains in place for emergency use only.

The bellmouth of the access extends approximately 29m between its tangent points with the western edge of the B4273, which is approximately 6.8m wide at the access point. The access itself is controlled by Give Way markings and associated signage.

Visibility at the access exceeds the 2.4m x 120m distances in both directions specified at condition 12 of the planning decision.

There have been no changes to design guidance which would result in the existing site access now being unacceptable since it was approved and constructed.

Almost all HGVs travelling to/from the Quarry do so via the B4273 to the south of the site, where they continue to Pontypridd before heading east to join the A470 at its grade-separated roundabout interchange, at which point they distribute primarily towards the south, where the larger conurbations in South Wales and M4 Motorway may be accessed.

12.3 Baseline Conditions

Output from the quarry averages some 400,000 tonnes per annum, which is distributed in HGVs via the local highway network.

Approval was granted in November 2013 (13/0825/23), for the construction of a replacement asphalt plant within the site, which is now operational.

The existing operational hours in terms of HGV movement to/from the site are restricted by planning condition to 07:00 – 19:00 Monday to Friday and 07:00 – 16:00 on Saturday, with no working on Sundays or Bank Holidays (condition 15). However, these time limits do not apply to the asphalt plant, due to the increasing practise of undertaking highway maintenance at night.

12.4 Assessment of Traffic Effects

12.4.1 Study Area

The study area for the assessment of traffic effects includes the site access, the B4273 to the south down to the signal-controlled junction with the A4223, and the A4223 link to the A470 dual carriageway.

The access to the site and description of the B4273 is provided in Section 12.2 above.

Continuing south along the B4273 into Pontypridd, the carriageway width varies between 6.4m and 8.9m. Approximately 260m to the south of the main access, the B4273 crosses over a railway line through a left-right bend on a bridge.

Immediately to the south of the bridge the speed limit reduces to 30 mph and the route becomes more urban in character, with terraced housing and on-street parking on the west side.

In the vicinity of the on-street parking, the effective carriageway width reduces to 4.65m. However, due to the vertical and horizontal alignment, drivers travelling northbound are able to clearly see oncoming traffic rounding the bend at the bridge to the north above the parked cars, providing good inter-visibility between road users.

Approximately 250m southwest of the bridge over the railway line, the carriageway passes below another rail bridge. On the approach to the bridge signage alerts road users to the existence of speed cameras. A pedestrian footway is introduced on the east side of the carriageway as it approaches and passes under the railway bridge, continuing to the A4223 and beyond. Double yellow lines are introduced on both sides of the carriageway at the bridge.

This railway bridge is immediately to the north of the bridge over the River Taff, which has a 7.5 tonne maximum gross weight limit in place and connects to The Parade. However, the bridge, known as White Bridge due to its colour, is currently closed as a result of damage during the floods in 2020. At present, it is not known when the bridge is likely to reopen.

Immediately beyond White Bridge signage alerts road users to the fact that the 30 mph speed limit is enforced by average speed cameras.

From this point the B4273 runs parallel to and west of the River Taff to the signal-controlled junction with the A4223.

To the southwest of White Bridge, there is further terraced housing extending approximately 110m to the junction with Craigyrhesg Road. The on-street parking along their frontages reduces the effective carriageway width to a minimum of 4.25m. Where vehicles were not parked the width of the carriageway is approximately 6.5m.

Observations on site revealed that some vehicles passed each other with care, whilst others gave way on a give and take basis over the narrowest section.

Beyond the southern end of the terraced housing there are on-carriageway bus stops and further on-street parking between the Craighyrhesg Road and Lewis Terrace junctions. The nominal width of the carriageway beyond the first average speed camera increases to 8.9m, with a clear width of 6.8m where vehicles were parked on the west side of the route.

Continuing southbound, housing is reintroduced on the west side of the carriageway. Double yellow lines continue on the east side past Lewis Terrace and around the left-hand bend beyond when travelling southbound. Double yellow lines are also provided on the west side around the bend beyond the permitted parking areas.

Beyond the bend, single yellow lines imposing parking restrictions between 7am to 7pm Monday to Saturday line both sides of the carriageway, which has a nominal width of 7.3m, narrowing to 6.1m on the approach to the A4223. However, there are two lay-bys on the east side of the carriageway, which were occupied by several vehicles during the site visit. There are also further on-carriageway bus stops on both sides of the road.

As the B4273 approaches the A4223, double yellow lines are introduced, and the southbound lane widens to provide two traffic lanes at the signal stop line.

The nearside lane is marked for left turning traffic onto the A4223 to cross the River Taff towards the A470 and also ahead movements to Taff Street. The offside lane is marked for right turning vehicles only, onto the A4223 Gelliwastad Road, which continues south towards the intersection with the A4058.

The majority of Quarry vehicles turn left to cross the River Taff and follow the A4223 for approximately 220m to its grade-separated roundabout junction with the A470 dual carriageway, which is partially signal controlled.

The configuration of the junction allows access to the north facing traffic lanes of the A470 dual carriageway. However, the A470 is elevated above the junction and as a result, in order to access the south facing traffic lanes of the dual carriageway, drivers travel along parallel access roads adjacent to the main route on each side for approximately 0.5km to the grade-separated junction between the A470 and A4058, where access to and from the southern section of the A470 is available.

12.4.2 Traffic Conditions

In order to establish baseline traffic conditions in the area, the Highway Authority, RCT, was contacted. It was found that there was no updated information available beyond that from 2012 and 2013 which was considered when the assessment for the western quarry extension was undertaken in 2015. The following information was provided in the Environmental Statement for the Western Extension application (May 2015), which led to no objection on highway grounds.

The Highway Authority provided two traffic surveys on the B4273 to the south of the Quarry access.

A 7 day survey undertaken from 09/03/2012 and a 5 day survey undertaken from 01/03/2013 were provided.

In terms of the 7 day survey, the results revealed that the daily traffic flows between Monday and Friday over the 24 hour period ranged between 11,114 and 11,918 vehicles, giving a day to day variation of 804 movements, with an average over the 5 days of 11,584. The flow on Saturday was lower at 8,364 vehicles, including 454 (4.8%) HGVs.

The HGV proportion during the 5 day week averaged 7.3%, which equates to 846 vehicles per day.

The AM peak hour flow between Monday and Friday was found to occur between 08:00 – 09:00 with an average of 946 vehicles (246 northbound / 700 southbound), of which 71 (7.5%) were HGVs. The day to day variation during the AM peak hour was 67 vehicles from totals of between 910 and 977 movements.

The PM peak hour occurred between 17:00 – 18:00 with an average flow of 974 vehicles (638 northbound / 336 southbound), of which 46 (4.7%) were HGVs. The PM peak hour flows ranged between 930 and 1,010 movements, giving a daily variation of 80 vehicles.

During the weekday working hours of the Quarry (07:00 – 19:00) the traffic flows varied between 8,915 (Monday) and 9,480 (Friday), giving a range of 565 vehicles. The 5 day average flow during the operating hours was 9,222 vehicles, of which 742 (8%) were HGVs

The peak hour flows during the period were as described above. The hourly traffic flows varied between 579 and 1,010 movements throughout the working week of the Quarry, giving an hourly variation of 431 vehicles.

On Saturday, the traffic flow between 07:00 – 16:00 was 5,556 vehicles, of which 285 (5.1%) were HGVs. The hourly flows on Saturday varied between 251 and 843 movements during this period, giving an hourly variation of 592 vehicles.

The 5 day traffic survey commencing on 01/03/2013 recorded data from Friday 1st March to Tuesday 5th March inclusive. The average weekday flows from the Friday, Monday and Tuesday data revealed a daily traffic flow of 11,649 movements over the 24 hour period from totals of between 10,903 and 12,240 vehicles; giving a day to day variation of 1,337 vehicles. The flow on Saturday was lower at 10,297 vehicles, including 493 (4.8%) HGVs.

The HGV proportion during the 3 weekdays surveyed averaged 7.3%, which equates to 847 vehicles per day.

The AM peak hour flow on the three weekdays surveyed was found to occur between 08:00 – 09:00 with an average of 939 vehicles (247 northbound / 692 southbound), of which 75 (8%) were HGVs. The day to day variation during the AM peak hour was 103 vehicles from totals of between 902 and 1,005 movements.

The PM peak hour occurred between 17:00 – 18:00 with an average flow of 962 vehicles (633 northbound / 329 southbound), of which 41 (4.3%) were HGVs. The PM peak hour flows ranged between 926 and 992 movements, giving a daily variation of 66 vehicles.

During the working hours of the Quarry (07:00 – 19:00) the weekday flows varied between 8,759 (Monday) and 9,655 (Friday), giving a range of 896 vehicles. The 3 day average flow during the operating hours was 9,301 vehicles, of which 739 (7.9%) were HGVs

The peak hour flows during the period were as described above. The hourly traffic flows varied between 546 and 1,015 movements throughout the working week of the Quarry, giving an hourly variation of 469 vehicles.

On Saturday, the traffic flow between 07:00 – 16:00 was 5,788 vehicles, of which 390 (6.7%) were HGVs. The hourly flows on Saturday varied between 261 and 831 movements during this period, giving an hourly variation of 570 vehicles.

As can be seen from the survey results above, the total traffic volumes between the two surveys are broadly similar. During some periods of the 2013 survey the traffic volumes were higher and vice versa.

The highest daily flow during the operating hours of the Quarry was recorded in 2013 (9,489 vehicles), as was the highest hourly flow (1,015 (605 northbound / 410 southbound). These peaks are within 0.1% (9 vehicles) and 0.5% (5 vehicles) respectively of the comparable peaks recorded in 2012, which suggests a normal daily variation, rather than any particular traffic growth pattern.

In order to update the historic information, following consultation with the Highway Authority, a new traffic survey was undertaken, at the same location as the previous surveys, between Friday 27 November and Thursday 03

December 2020 using an Automatic Traffic Counter. This period fortunately fell between the lockdowns imposed in Wales, when travel was not restricted.

The results revealed that over the 7 day survey, the daily traffic flows between Monday and Friday over the 24 hour period ranged between 8,663 and 9,728 vehicles, giving a day to day variation of 1065 movements, with an average over the 5 days of 9,142. The flow on Saturday was lower at 7,198 vehicles, including 202 (2.8%) HGVs.

The HGV proportion during the 5 day week averaged 3.5%, which equates to 318 vehicles per day.

The AM peak hour flow between Monday and Friday was found to occur between 08:00 – 09:00 with an average of 702 vehicles (256 northbound / 446 southbound), of which 35 (5%) were HGVs. The day to day variation during the AM peak hour was 122 vehicles from totals of between 659 and 781 movements.

The PM peak hour occurred between 16:00 – 17:00 with an average flow of 778 vehicles (511 northbound / 267 southbound), of which 27 (3.5%) were HGVs. The PM peak hour flows ranged between 699 and 815 movements, giving a daily variation of 116 vehicles.

During the weekday working hours of the Quarry (07:00 – 19:00) the traffic flows varied between 7,446 (Monday) and 8,221 (Friday), giving a range of 775 vehicles. The 5 day average flow during the operating hours was 7,777 vehicles, of which 288 (3.7%) were HGVs

The peak hour flows during the period were as described above. The hourly traffic flows varied between 488 and 859 movements throughout the working week of the Quarry, giving an hourly variation of 371 vehicles.

On Saturday, the traffic flow between 07:00 – 16:00 was 4,848 vehicles, of which 149 (3.1%) were HGVs. The hourly flows on Saturday varied between 258 and 680 movements during this period, giving an hourly variation of 422 vehicles.

By comparing the 2020 survey data with that recorded during 2012 and 2013, it is apparent that the daily and peak hourly flows are lower, as are the number of HGV movements. It is likely that these reductions are a result of seasonal variations, suppressed travel arising from the Covid 19 outbreak and potentially the closure of White Bridge, as vehicles divert to other routes when leaving the residential estate it connects to.

In terms of the traffic attracted to Craig yr Hesg Quarry, based on 5.75 working days per week, when excluding public holidays and planned shut-downs for extended breaks (such as at Christmas), it is established that there is a total of 287.5 working days per annum.

Based on the average output of 400,000 tonnes material being transported in 20 tonne average payloads (as was assumed in the ES for the 2015 quarry extension application), this equates to 70 loads per full working day, which results in 140 total HGV movements per day on the local highway network. If it is assumed notionally that the movements are distributed throughout the operating hours, then this would result in an average of 6 loads / 12 movements per hour when taking into account the normal operating hours at the site of 07:00 – 19:00 during the week. In practice, loading tends to be concentrated in the period 07.00 – 17.00 which would give an average of 7 loads / 14 movements per hour.

However, analysis of weighbridge information by Hanson revealed that due to a significant proportion of material being transported in large bulk loads within articulated HGVs, the average payload was found to be 24 tonnes. Based on the increased payload, the average daily traffic flow is calculated to be 58 loads / 116 HGV movements per day. This equates to an average of 5 loads / 10 movements per hour over a 12 hour working day and 6 loads / 12 movements per hour when averaged over the 10 hour period 07:00 – 17:00 during which the majority of transport activity occurs.

Weighbridge data was also reviewed between Friday 27 November and Thursday 03 December 2020 for comparison with the recent ATC survey.

It was found that 52 loads / 104 HGV movements occurred on Friday, 4 loads / 8 HGV movements on Saturday, 50 loads / 100 HGV movements on Monday,

33 loads / 66 HGV movements on Tuesday, 40 loads / 80 HGV movements on Wednesday, and 41 loads / 82 HGV movements on Thursday. These figures give a daily average of 39 loads / 78 HGV movements, or 44 loads / 88 HGV movements if the low Saturday figure is excluded. [Note: a total of 39 loads per day x 287.5 days x 24 tonnes per load = 269,100 tonnes per annum, which falls significantly below the 400,000 tonnes per annum average.]

The highest AM peak hour flow recorded during the 2020 ATC survey occurred between 08:00 – 09:00 on Friday 27 November (781 vehicles including 39 HGVs). During this hour, a total of 4 loads / 8 HGV movements occurred at Craig yr Hesg Quarry.

The comparable PM peak hour occurred between 16:00 – 17:00 on Thursday 03 December (859 movements including 29 HGVs). The HGV activity at Craig yr Hesg Quarry during this hour was 1 load / 2 HGV movements.

Based on the 847 recorded HGV movements per day during the 2013 traffic survey, the percentage of HGVs attributable to Craig yr Hesg Quarry is calculated to be approximately 16.5% based on 140 movements per day associated with an average payload of 20 tonnes, reducing to 13.7% based on the higher payload of 24 tonnes, which results in an average of 116 movements per day at the Quarry.

Due to the lower traffic flows recorded during the 2020 ATC survey, it was found that the proportion of Craig yr Hesg Quarry HGVs within the total HGV flow, assuming all Quarry HGVs travelled to / from the south of the access, thereby crossing the ATC site, varied between approximately 4% on Saturday and 32.9% on Friday. Over the whole 7 day period, the proportion of HGVs associated with the Quarry was calculated to be approximately 23%, increasing to approximately 24.5% over the 6 operational days, which excludes the observed Sunday HGV flow.

As is apparent from the observed traffic data, both the hourly and daily total of vehicle movements associated with the Quarry fall well within the normal variations in traffic volumes on the adjoining highway network during the respective time periods.

In order to assess the operational capacity of the B4273, the peak hour traffic volume of 1015 movements established from the earlier 2013 traffic survey, has been compared with the design capacity published in Table 2 of TA 79/99 "*Traffic Capacity of Urban Roads*".

Based on Table 1 of TA 79/99, the characteristics of the B4273 are most closely matched to a UAP3 route, which has kerbside bus stops, on-street parking and frontage access.

Table 2 of TA 79/99 confirms the hourly capacity of a 6.1m carriageway of that type is 900 vehicles (one way), increasing to 1110 at 6.75m width and 1300 at a 7.3m width. The flows in Table 2 are based on a 60/40 directional split of traffic with HGV proportions of up to 15%. When allowing for the additional 40%, as the figures in Table 2 represent the higher 60% proportion of the total flow, the total two-way capacity increases to 1500 vehicles at 6.1m, 1850 at 6.75m and 2167 at 7,3m carriageway widths.

By comparing these capacities with the peak hour flow of 1015 movements (605 northbound / 410 southbound), it is apparent that the minimum one-way capacity of 900 vehicles for a 6.1m wide carriageway is approximately 48% higher than the observed flow, as is the combined flow of 1500 when compared with the two-way peak of 1015 movements observed during the 2013 traffic survey.

Based on this information, it is apparent that the current peak hour flows represent approximately 67% of the design capacity of the B4273, leaving a reserve capacity of approximately 33%, which suggests road capacity is not a material concern regarding the determination of the planning application.

Traffic growth predictions from TEMPro suggest that between 2013 and 2029, when the residual stone reserves at the quarry would be exhausted following completion of extraction in 2028, within the RCT Middle Layer Super Output Area (MSOA) 015 where the count was undertaken, traffic flows are predicted to increase by 17.80% during between 15:00 – 16:00, which coincides with the recorded peak of 1015 movements. Based on this growth prediction, the peak hour traffic flow in 2029 would be 1196 movements.

Repeating the calculation for the 16:00 – 17:00 time period in 2020 when the peak of 859 movements were recorded, TEMPro predicted a growth of 5.99% by 2029, resulting in a flow of 910 movements.

By comparing both figures with the hourly capacity of 1500 movements previously established, it is apparent that the B4273 would retain a reserve or spare capacity of at least 304 vehicles (20.2%) in the 2029 peak hour.

As a result, it is concluded that highway capacity is not considered to be a constraint in this case; a conclusion that was also reached by the Highway Authority when it considered the Western Extension application, which proposed continuation of extraction and associated traffic movements for some 25 years.

It is recognised that the planning permission for quarrying expires in December 2022 (with the removal of residual stocks to be completed by December 2023), and in the absence of a planning permission for the requested 6-year time extension, HGV movements from the quarry would cease at the end of December 2023. A new 'baseline' for traffic flows would then be apparent, without the HGV contribution from the quarry. However, in circumstances where the HGV traffic flows are relatively modest (of which quarry traffic is a sub-component of overall HGV movements), and there is spare / residual flow capacity on the B4273, any reduction in traffic from the quarry is not considered to be material in terms of overall traffic flow. Similarly, if the impact of the proposed development were assessed based on the new, lower baseline, by adding the quarry traffic back onto the network, the same cumulative flows as have been considered within this appraisal, and which have been found to be acceptable, would be the result.

12.4.3 Highway Safety Effects

In order to establish whether the activities at Craig Yr Hesg Quarry may have resulted in compromised highway safety, the Crashmap database was reviewed for the most recent 5 year period available (2015 to 2019 inclusive).

The area of search included the length of the B4273 from south of the Abercynon Road junction, approximately 0.6km north of the Quarry HGV egress, to the A4223 south of the quarry; along the A4223 to the A470 and along the parallel access roads to the southern junction between the A470 and A4058.

Within this area a total of 17 personal injury collisions had been recorded, of which 15 were classified as slight and 2 as serious.

A review of the collision data revealed that none of the recorded collisions had any HGV involvement and none occurred at the access to Craig yr Hesg Quarry.

In the event there is a particular feature of the highway network that results in compromised safety, it is common to find a number of collisions in the same location that share similar characteristics.

In the absence of any recorded collisions involving HGVs on the local roads within the last five years, on a network that routinely accommodates HGV traffic, applying the evidence-based approach advocated in current highway design guidance indicates the existing road network can safely accommodate the HGV traffic associated with the existing activities at Craig yr Hesg Quarry and other businesses which attract such vehicles.

12.5 Development Proposals

12.5.1 Application Details

In the context of transport and highways issues, the key features of the development are summarised as follows:

- Continuation of permitted activities for an additional period of 6 years.
- The predicted output/throughput at the site is assumed for the purposes of this study to remain at recent levels of approximately 400,000 tonnes per annum on average.
- The combined activities at Craig yr Hesg Quarry are assumed to continue to attract in the order of between116 and 140 HGV movements

per average day on the local highway network, which is consistent with recent and historic activities on site.
- The existing, recently improved site access arrangements would be retained throughout.
- The types of HGVs serving the site would be consistent with current and historic operations, which have been safely accommodated on the local highway network.
- The majority of HGVs except for the occasional vehicle making a local delivery to satisfy demand in the area would travel to/from the south along the B4273 to the A4223, then to/from the west to join the A470, where the majority would head to/from the south via the dual carriageway route.
- The operating hours would remain in accordance with the existing planning permission and current/recent activities.
- In effect, in terms of highway and transport matters, the proposed time extension would not in itself change the current situation beyond the fact that existing hourly, daily, annual traffic movements to/from the site would continue to supply established markets with the nationally important aggregate for an additional period of 6 years beyond the currently permitted end date for operations, assuming an average output of 400,000 tpa is maintained which is anticipated to be the case.

12.5.2 Trip Generation

As described within Section 12.4.2, in terms of the traffic attracted to Craig yr Hesg Quarry, based on 5.75 working days per week, when excluding public holidays and planned shut-downs for extended breaks (such as at Christmas), it is established that there is a total of 287.5 working days per annum.

Based on an assumption of the average output of 400,000 tonnes material being transported in 20 tonne average payloads, this equates to 70 loads per full working day, which results in 140 total HGV movements per day on the local highway network. However, weighbridge data indicates the actual average payload is 24 tonnes, which gives an average of 58 loads / 116 HGV movements per day.

These movements would be distributed throughout the day, with a notional 6 loads / 12 movements per hour when taking into account the maximum permitted operating hours at the site of 07:00 – 19:00 during the week, or 7 loads / 14 movements over the typical loading period of 07.00 – 17.00 based on the 140 movements per day. This reduces to an average of 5 loads / 10 movements per hour over a 12 hour working day and 6 loads / 12 movements per hour when averaged over the 10 hour period 07:00 – 17:00 during which the majority of transport activity occurs based on 116 movements per day.

Other than occasional vehicles meeting local demand, all traffic heads to/from the south along the B4273, A4223 and A470.

12.6 Development Impacts

12.6.1 Environmental Impacts

In terms of the environmental effects of the proposed development related to transport matters, these are limited to noise and emissions typically associated with vehicles plus highway cleanliness. The noise, air quality and dust implications of the proposed development are considered in the relevant chapters of this ES.

In this case, the potentially sensitive receptors are limited to the properties adjacent to the access road and those along the access route described above.

In terms of the limited number of HGVs making local deliveries, if the materials being delivered from the site were sourced from elsewhere, the same types of vehicle would still travel along the local routes, albeit from further afield, with the HGV's thus travelling over a wider area of the network.

There have been no substantive changes to the local road network since the planning conditions at the site were last reviewed in 2013, and therefore there is no reason to believe that the highway impacts would change significantly. Any changes that may occur between 2023 and the end of the extended

development period would naturally take into account the existing activities at the Quarry and the associated traffic movements.

12.6.2 Highway Capacity Impacts

The existing Quarry is permitted to distribute aggregate until 31st December 2023. During this period, it is assumed for the purposes of the traffic assessment that there would not be any significant variation in existing output rates or associated vehicle movements, although there will be fluctuations to reflect market demand on a daily basis, as is apparent from the traffic survey and weighbridge data previously detailed.

As the proposed development would, in effect, simply represent a continuation of current activities for 6 years beyond the current end date, the only potential changes in terms of highway matters are limited to traffic growth associated with other development or revisions to the highway network.

Given that the majority of new planning permissions have an implementation period of between three and five years, any extant permissions, or new permissions that may be granted up to 2023, will clearly take into account the prevailing traffic conditions on the local highway network, which includes the existing traffic activity associated with Craig yr Hesg Quarry, as would any revisions to the highway network.

Therefore, any extant or subsequently permitted development would, by definition, take into account the cumulative impact with the baseline highway conditions.

Having considered the foregoing, it is concluded that in practical terms, the proposed development would have no adverse impact on highway capacity when compared with the existing situation, which has been shown to be satisfactory.

Notwithstanding this, a review of the main access route to the site confirms that based on the highest hourly flow recorded from the 2013 and 2020 traffic surveys, in the proposed 2029 design year, when operations at the site will have been very largely completed the B4273 retains a reserve or spare capacity of 304 vehicles per hour, which equates to 20.2%. This supports the conclusion above that the impact of the proposed development on highway capacity would be acceptable.

12.6.3 Highway Safety Impacts

It is apparent from the review of recorded collisions over the most recent 5 year period available, that the existing road network is capable of accommodating HGV activity associated with both the site and other businesses in the area which routinely attract such vehicles,

The last 5 years includes a period when operations at the site were ongoing at the levels assumed to continue into the future, resulting in similar traffic volumes on a day to day and annual basis.

In the absence of any recorded collisions involving HGVs on the local road network within the last five years on the routes that routinely accommodate the HGV traffic from the Quarry, applying the evidence-based approach advocated in current highway design guidance indicates there is no reason to believe that the HGV activity associated with the ongoing activities at the site would have an unacceptable impact or represent an increased level of risk to safety.

12.7 Mitigation Measures

A designed – in mitigation measure has already been implemented via the construction of the new two way access to the quarry which delivered improved visibility and geometry at the connection to the B4273.

The existing road network currently accommodates the traffic associated with the activities at Craig yr Hesg Quarry, which are assumed to continue as existing for the life of operations associated with the proposed time extension.

As has been established, the existing road network retains sufficient capacity to accommodate the traffic and has a sufficient level of geometric design to

facilitate safe access, as demonstrated by the lack of accidents involving HGVs within the study area in recent years.

In general terms, the highway network is therefore considered to be acceptable and no geometric improvements are required to accommodate the ongoing activities at Craig yr Hesg Quarry beyond routine maintenance of the new quarry access road and its visibility splays.

12.8 Residual Impacts

Following completion of the development there should be no residual impacts in terms of transport matters.

12.9 Summary

The assessment of the impact on the local highway network of the proposed time extension for operations at Craig yr Hesg Quarry has considered the extant planning permission and the implications of the proposed activities going forward.

The proposals effectively represent a continuation of current activities as the proposed hours of operation, method of transport and types of vehicle used would not materially change. Whilst there has been a relatively recent revision to the existing access configuration, these works represent an improvement to the network in terms of safety.

The safety performance of the site accesses and local highway network, which continue to accommodate daily HGV movements, has been reviewed using collision records. The records confirm that there have been no recorded accidents at the site access and no recorded accidents involving HGVs on the neighbouring highway network.

The typical rate of extraction would result in an average of between 58 loads / 116 movements and 70 loads/140 HGV movements per day on the local road network depending upon whether the average payload continues at recently established or previously assumed levels respectively.

In accordance with the ongoing and historic operations, the majority of HGVs travelling to/from the site would travel to/from the south via the B4273, A4223 and A470.

Traffic flow information on the B4273 confirms current flows are lower than those previously recorded in 2013. Based on the highest flows, it was established that the B4273 currently operates at 67% of its design capacity and therefore retains a reserve or spare capacity of approximately 500 vehicles, or 33% of its design flow, under peak hour conditions. As a result of predicted traffic growth, in the proposed design year of 2029, when exports from the Quarry would cease, the reserve capacity would remain at 304 vehicles per hour and 20.2% when compared with the peak hour capacity of the route.

If assessed based on the more recent flows, the level of spare capacity available currently and in the 2029 design year is increased.

As a result, highway link capacity is not considered to be a constraint to the proposed extended period of operations at Craig yr Hesg Quarry.

12.10 Conclusions

Following completion of the review of the highway and transport implications of the proposed development it is concluded that:

- The recently improved site access is acceptable to serve the proposed development;
- The quantum of proposed development traffic is already accommodated on the local road network, which has been demonstrated to retain substantial spare capacity;
- There are no recent records of accidents involving HGV's in the vicinity of the quarry or on the identified access route to/from the A470; and
- The existing planning permission provides for the existing HGV activity to continue until 31st December 2023, 12 months after the permitted end date for the winning and working of mineral within the Quarry, to allow residual stocks to be sold. As a result, any current, committed or future

development that may be approved, which could have an impact on the local highway network, would take the existing and proposed HGV movements into account.

Accordingly, it is concluded that the proposed development is acceptable in terms of highway and transport considerations.

This conclusion was supported by the Council, as it raised no objection on highway grounds when considering the previously proposed western extension to Craig yr Hesg Quarry, in circumstances where the proposal predicted continuation of the same activities at the site for an additional period of 25 years.

TRANSPORTATION 12

13.0 CULTURAL HERITAGE

13.1 Introduction

Cultural Heritage Assessments were undertaken by Cotswold Archaeology as part of the 2010 EIA /ES submitted to accompany the ROMP Review application, and the 2015 ES which accompanied the western extension application.

In summary, the studies noted that no cultural heritage features are recorded within the site and the quarrying operations undertaken will have removed any unrecorded archaeological remains which may have existed. The 2015 study considered the low potential for unrecorded archaeological remains to be present within the western extension area, but this issue is not relevant to this current ES. However, the 2015 study reiterated the conclusion of the 2010 study that there would be no direct or indirect cultural heritage effects associated with development within the existing quarry area.

13.2 Current Circumstances

At the time of the 2010 ES there were small areas on the periphery of the site where operations had not taken place and where soil stripping was required to expose the underlying mineral reserve. Condition 41 of the ROMP schedule of conditions required the Planning Authority to be notified at least 14 days in advance of soil stripping to allow archaeologists nominated by the Authority to observe the soil stripping and record any finds. In practice, notwithstanding condition 41, there were no remaining areas of undisturbed land requiring soil stripping by the time of the ROMP determination in 2013, and the requirements of the condition thus became redundant.

In addition, there are more extensive undisturbed areas on the periphery of the site, within the planning permission boundary, largely associated with woodland, where such woodland will itself have significantly impacted upon any below ground archaeology. However, that woodland will not be disturbed as part of the approved quarry development scheme.

13.3 Designated Heritage Assets

There are no World Heritage Sites or sites included on the Tentative List of Future Nominations for World Heritage Sites issued by the Secretary of State for Culture, Media and Sport situated within the site or its environs.

There are no Scheduled Ancient Monuments, Registered Parks or Gardens, Registered Battlefields or Landscapes of Outstanding and Special Historic Interest within the site or the study area.

There are no Listed Buildings within the 500m study area around the boundary of the site. However, a small number of Listed Buildings are located within the wider environs of the site. These were shown on Gigure 14.1 of the 2015 ES, reproduced below as Figure 13.1. The reference to the 'exetension area' shown on the figure is not relevant to the current ES, but the cultural heritage features in the general vicinity of the Quarry have not changed and include:

- Grade II* White Bridge (Figure 13.1, **1**), located *c.* 770m to the south-east of the site;
- Grade II Railway bridge over Graig-yr-Hesg (Figure 13.1, **2**), *c.* 740m to the south;
- Grade II Taff Vale Railway viaduct over the River Taff (Figure 13.1, **3**), *c.* 750m to the south-east;
- Grade II Railway viaduct over Nant Clydach and Grade II Taff Vale Railway Bridge over Cwm Clydach (Figure 13.1, **16**), which are located approximately 820m to the north-east; and
- Grade II Road Bridge over Nant Clydach (Figure 13.1, **17**), *c.* 900m to the north-east.

A gazetter of wider heritage assets in the within the surroundings of the site is provided in Table 13.1 below, and shown on **Figure 13.1**:

Table 13-1 Heritage assets within the surroundings of the site

No.	Name	Period	Status	Reference
1	White Bridge (also known as Berw Bridge)	Modern	Grade II* Listed Building	Cadw No. 24848
2	Railway bridge over Graig-yr-Hesg Road, including integral stone drainage channel	Modern	Grade II Listed Building	Cadw No. 24889
3	Taff Vale Railway viaduct over River Taff	Modern	Grade II Listed Building	Cadw No. 24849
4	The Glamorganshire Canal	Post-medieval	-	HER No. 01628.0s
5	Lan farmhouse	Modern	-	HER No. 300598
6	Berw aqueduct	Modern	-	HER No. 407023
7	A feeder probably associated with industrial use of water	Modern	-	-
8	Taff Vale Railway	Modern	-	HER No. 01570.0s
9	Daren-ddu Colliery and associated tramway	Modern	-	HER No. 33471
10	Congregational Hall, English Independent Church, Bonvilstone Road	Modern	-	HER No. 10133
11	Norton Bridge Wesleyan Zethodist Chapel, Pontsion-Norton Street	Modern	-	HER No. 14196
12	St Luke's Church, Bedw Road	Modern	-	HER No. 14192
13	A 19th century wall painting in what is believed to have been a chapel	Modern	-	HER No. 116847
14	Findspot of a Neolithic axe head	Prehistoric	-	HER No. 01026m
15	Desk based assessment for development at Craig-yr Hesg Quarry	Previous investigation	-	HER No. E003276
16	Railway viaduct over Nant Clydach; Taff Vale Railay Bridge over Cwm Clydach	Modern	Grade II Listed Buildings	Cadw No. 24853, 81031 and 80764

No.	Name	Period	Status	Reference
17	Road Bridge over Nant Clydach	Modern	Grade II Listed Building	Cadw No. 80762

13.4 Direct Effects

Given that the quarry has reached its full development footprint, there are no surviving potential below ground archaeological features remaining within that footprint. There would be no disturbance to the peripheral woodland areas and thus no effect on any archaeological features which may be present in those areas.

Overall, there would thus be no direct archaeological effects associated with a continuation of the quarry development for the requested extended time period.

No mitigation is thus required with regard to any potential archaeological remains.

13.5 Indirect Effects

The topography and screening provided by the development confirms that the Listed Buildings located to the north-east of the site (Figure 13-1, 16-17) are separated from the site by extensive modern development, and therefore the proposed development will not affect the settings of these assets.

Similarly, the effects of topography, screening provided by the existing quarry and woodland to the south of the site, together with the location of the Listed Buildings south of the site within an urban environment (Figure 13-1, 1-3) is such that the ongoing development will not have the potential to affect the setting of these designated heritage assets.

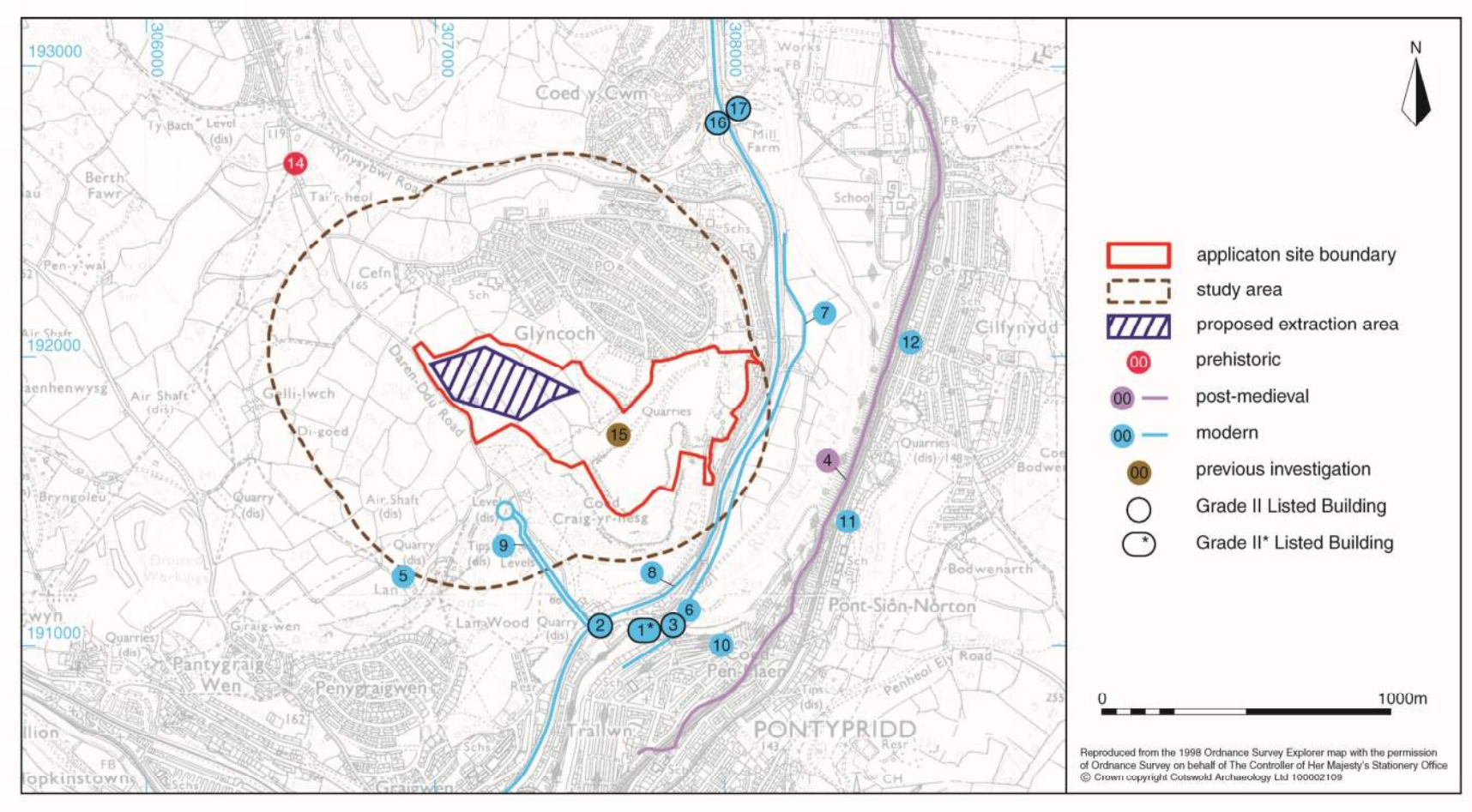
No mitigation measures are thus required with regard to impacts upon designated heritage assets, as the ongoing development will not affect the settings of Listed Buildings located within the environs of the site. This is evident from the absence of conditions in the ROMP schedule relating to cultural heritage interests.

13.6 Conclusions

There are no proposals to amend the quarry development scheme or the existing footprint of the already developed area. It follows that there would be no additional effect on any potential below ground archaeological features and no change to the absence of any effect on the setting of listed buildings in the general vicinity of the quarry.

These circumstances would not change by virtue of the requested extended time period to complete the development.

Figure 13-1 Cultural Heritage Features in the vicinity of the Quarry



..

14.0 SOCIO-ECONOMIC, WELL-BEING AND HEALTH ISSUES

14.1 Introduction

For the purposes of this chapter, health is defined as 'a state of complete physical, mental and social wellbeing and not merely the absence of disease or infirmity' (WHO, 1948). As such, this chapter applies a broad socio-economic model of health that encompasses conventional health impacts such as those associated with environmental health determinants (such as air quality and noise), along with wider socio-economic health determinants (such as employment) vital to achieving good health and wellbeing.

While a dedicated health chapter was not included as part of the ES which accompanied the 2005 western extension application, a response to health and wellbeing issues raised during public consultation on that application was provided in 2016. For completeness, and as part of this ES prepared in support of the Section 73 extension of time application, some of the content of that previous response has been integrated within this chapter, with updates as appropriate.

Reference is also made to consultation responses and conclusions reached regarding the potential health issues associated with the proposed western extension development which provide a context to the consideration of these issues as part of the proposed time extension application.

14.2 Planning Policy Context

14.2.1 Welsh National Planning Policy

Achieving a healthier Wales, whereby people's physical and mental well-being is maximised and choices/behaviours that benefit future health are understood, is one of seven goals outlined in the Well-being of Future Generations (Wales) Act 2015 (Welsh Assembly, 2015).

Planning Policy Wales Edition 11 (PPW11) (Welsh Government, 2021) aims to deliver the vision set out by the Well-being of Future Generations Act. As such, "promoting healthier places" is identified as one of several key themes which collectively contribute to placemaking in Wales. It is recognised that the built and natural environment is a key determinant of health and wellbeing, whereby the planning system, and planning authorities themselves, have a role to play in the prevention of health impacts caused or exacerbated by a range of social, economic, environmental and cultural factors which determine health. As a result, the planning system must consider the impacts of all proposed developments on existing communities to maximise health protection, wellbeing and safeguard amenity.

In addition, within PPW11, health protection is mentioned in the context of the following specific determinants of health relevant to the proposed development:

- Paragraph 3.55 states that for land which has been previously developed on, it may be appropriate to secure remediation (if land is contaminated) to reduce risks to human health.
- Paragraph 5.14.2 states that there is a requirement to ensure the adequate supply of minerals with the protection of human health, safety and general wellbeing.
- Paragraph 6.7.2 states that national air quality objectives represent a pragmatic threshold above which government considers the health risks associated with air pollution are unacceptable. It further notes that '*air just barely compliant with these objectives is not 'clean' and still carries long term population health risks*'. From a public health perspective, the primary pollutants of concern are nitrogen dioxide and particulate matter, which currently have no safe threshold defined, and therefore the lower the concentration of those pollutants the lower the risks of adverse health effects. As a result, PPW11 confirms that it is desirable to keep levels of pollution as low as possible.
- Paragraph 6.7.3 states that certain sounds can be problematic, can affect amenity and be prejudicial to health or a nuisance. In addition, it is recognised that lower levels of noise can still be annoying or

disruptive with impacts on amenity, and as such, amenity should be protected through the planning process wherever necessary.

The Minerals Technical Advice Note (MTAN) Wales 1 (Welsh Assembly, 2004) makes reference to potential health effects associated with dust and particulate air pollution, stating that the potential impact on health must always be considered in relation to proposals for aggregates extraction and a health impact assessment should be carried out for any proposal for a new quarry or sand and gravel pit located within one kilometre of an existing community. Given that the Section 73 application which forms the subject of this ES represents a request to continue operations at an existing quarry rather than establish a 'new quarry', a 'health impact assessment' is not mandatory in this case, but as noted in the introduction, an overview has been included for completeness via this chapter.

In addition, MTAN1 makes reference to a range of other potential quarry impacts which may cause concern to neighbours. These include ground vibration and air overpressure (which can be regulated by planning conditions), and fly rock, although MTAN1 confirms that fly rock incidents are relatively rare as the Health and Safety Executive regulations ensure, as far as practicable, that blasts are implemented to modern design specifications.

14.2.2 Local Planning Policy

The proposed development lies within the administrative area of Rhondda Cynon Taf (RCT) County Borough Council. The relevant local planning policies detailed within the RCT Local Development Plan 2006-2021 (Rhondda Cynon Taf County Borough Council, 2011) are outlined below.

On the basis that health and wellbeing is affected by a wide range of factors, many local planning policies are indirectly relevant to the protection and promotion of good health and wellbeing. Therefore, for the sake of brevity and to remain proportionate, only local planning policies which explicitly mention health and wellbeing protection and/or promotion are considered relevant.

The only relevant local planning policy in this instance is Policy AW10 (Environmental Protection and Public Health) which states that development proposals will not be permitted where they would cause or result in a risk of unacceptable harm to health and/or local amenity because of: air pollution, noise pollution, light pollution, contamination, landfill gas, land instability, water pollution, flooding or any other identified risk unless it can be demonstrated that measures can be taken to overcome any significant adverse risk. The key tests are thus "*a risk of unacceptable harm*" and "*significant adverse risk*" which are considered further in the conclusions section of this chapter.

14.3 Relevant Guidance

The current EIA Regulations reinforce the inclusion of health within the planning and assessment process, depending on the specific characteristics of the particular development or type of development (ref Regulation 17 and Schedule 4), but do not provide definitive guidance on the approach, process or methodology to follow.

Taking this into consideration, it is considered appropriate for the health and wellbeing chapter to apply recognised Health Impact Assessment (HIA) guidance and other relevant guidance and combine this with the requirements defined for EIA to investigate, inform, assess and effectively communicate how and where all health issues and opportunities are addressed.

Along with general internationally recognised HIA guidance, the following Welsh guidance has been taken into account in undertaking the assessment:

- Health Impact Assessment: A practical guide [a joint venture between Public Health Wales, Cardiff University and the Wales Health Impact Assessment Support Unit (WHIASU) (Chadderton, Elliott, Green, Lester, & Williams, 2012)].

The assessment methodology follows a source-pathway-receptor model to identify and assess effects that are plausible and directly attributable to the proposed development. As shown in Table 14.1, a hazard source by itself does not constitute a health risk. It is only when there is a hazard source, a receptor and a pathway of exposure that there is any potential risk to human health. The same is true for potential human health benefits, where a positive

influence must be present alongside a pathway of exposure and a receptor for there to be a potential health improvement.

Table 14-1: Example of a Source-Pathway-Receptor Model for Human Health Effects

Source	Pathway	Receptor	Plausible Health Impact	Explanation
×	✓	✓	No	There is not a clear source from where a potential health impact could originate.
✓	×	✓	No	The source of a potential health impact lacks a means of transmission to a population.
✓	✓	×	No	Receptors that would be sensitive or vulnerable to the health outcome are not present.
✓	✓	✓	Yes	Identifying a source, pathway and receptor does not mean a health outcome is a likely significant effect; health impacts should be assessed (describing what effect will occur and its likelihood) and likely health effects are then evaluated for significance.

Where a source-pathway-receptor linkage exists, it is then the nature of the specific hazard source or positive influence; the magnitude of impact via the pathway of exposure; and the sensitivity of the receptor that will determine what level of health risk or benefit is predicted, if any.

14.4 Consultation

Reference is made in this chapter to an ES which accompanied the submission of a planning application for a western extension to Craig yr Hesg Quarry (May 2015), and the subsequent submission of a Report providing a Response to Public Consultation: Well Being and Environmental Health Issues. The application was refused by RCT in July 2020, and an appeal against that decision has been lodged by Hanson.

In summary, the development which was promoted as part of the application comprised a proposed western extension of the quarry, a continuation of operations in the existing quarry and processing plant area, and a time extension to allow for the working of the remaining reserves in the existing

quarry (some 5.7 m tonnes at 2015) and the additional reserves available in the extension area (some 10 m tonnes).

It is noteworthy that the single reason for refusing that application was confined to a concern regarding the separation distance between quarrying operations within the extension area and nearby properties. No issues were raised in the reason for refusal regarding operations within the existing quarry or the intended duration of operations, which, based upon a reserve of some 15.7 m tonnes and a continuation of average production of 400,000 tonnes per annum, would have given a notional life of some 40 years from 2015. With uncertainty over the marketability of a proportion of quarry fines created during processing, the 2015 ES traffic study assumed a 25-year extended period of operation beyond the current quarry end date of December 2022.

The details of the development were rigorously scrutinised and examined by RCT and external consultees, and the responses with regard to 'health' issues are instructive as a context to the consideration of the current proposal, which is confined to a continuation of operations in the existing quarry area, and a requested 6 year time extension for mineral extraction beyond December 2022.

Responses to the western extension application from consultees were set out in the Planning Officers Reports presented to RCT's Planning Committee in February and July 2020, and included:

> *"The Council's Public Health, Protection & Community Services consider that processes at the quarry can be managed to ensure a limited impact upon the level of air quality and neighbour amenity in respect of particulate matter and therefore the application is considered to be acceptable in this respect."*

The Reports also confirmed that the Council's Public Health, Protection & Community Services *"provided advice on what information is required to ensure impacts from the quarry in terms of air quality, noise and well-being can be limited, including a particulate matter management plan. Have suggested a financial contribution is made towards the Council carrying out air quality monitoring in the area* (agreed by Hanson)*. Have suggested that vibration levels and air overpressure limits are set in order to minimise any impact on the local community."*

Public Health Wales "*Note that there are no proposals to increase throughput or output at the site….. which averages 400,000 tonnes per annum. With regards local air quality impacts, the Air Quality Progress Report 2019 shows latest PM_{10} monitoring data (from Upper Garth Avenue, Gyncoch, for January to September 2018) in the locality is good and that PM_{10} concentrations comply with both long and short term health based national air quality objectives. As such and providing there is no increase in activity at the quarry site, adverse air quality impacts – and consequently human health impacts - are unlikely. This is confirmed by the Air Quality Progress Report 2019."*

The responses were summarised further in the July Committee Report to the effect that:

> *"Public Health Wales consider the current air quality in terms of PM_{10} particulates in the area to be 'good' and therefore in their opinion the community is not currently experiencing the effects of poor air quality. They and Cwm Taf University Health Board have indicated that based on current levels of activity adverse air quality impacts and consequently human health impacts are unlikely."*

It is recognised that separate consultation will be undertaken in relation to the current time extension application, but on the basis of the above responses there is no reason to assume any changes to the position set out above given that "*there would be no increase in current activity*" and the time period requested is now substantially shorter than that associated with the western extension application which itself was deemed to be acceptable in terms of potential effects on health.

14.5 Scope and Focus

As stated in the Response to Public Consultation Well-Being and Environmental Health Issues Report (2016), the main themes expressed by those who attended the public exhibition associated with the proposed

western extension development related to concerns regarding noise, blast vibration and dust. For the purposes of this chapter it is assumed that these same themes apply to ongoing operations at the existing quarry, albeit this has not been expressly established via additional public consultation.

As such, this chapter seeks to remain consistent with these themes of concern and draws from and builds upon information detailed within Chapter 3.0: Project Description and the relevant technical chapters within the ES (most notably; Chapter 8.0: Hydrology and Hydrogeology; Chapter 9.0: Noise; Chapter 10.0: Blast Vibration; Chapter 11.0: Air Quality; and Chapter 12.0: Transportation. This forms the basis of the assessment for health. For the sake of brevity, this chapter does not seek to repeat text or replicate data from the inter-related technical disciplines.

14.6 Study Area

Environmental health determinants (such as air quality and noise exposure) are unlikely to have significant local impact where the potential change in hazard exposure is limited by physical dispersion characteristics. As a result, the study area for the environmental health determinant assessment focuses on sensitive receptors in the Glyncoch ward/Middle Super Output Area (MSOA) or RCT U006 Upper Super Output Area (USOA) where data for ward level is not available). Data is compared against RCT County Borough Council and Wales for context.

Socio-economic health determinants (i.e. employment) are likely to have a wider influence as employees may commute to work from areas further away from the site. As a result, data for RCT County Borough Council is most relevant for the socio-economic health determinant assessment.

The sensitive receptors assessed remain consistent with those identified by the relevant technical chapters within the ES, which the Health chapter draws from.

14.7 Assessment Methodology

Within a defined population, individual sensitivity can vary due to a range of factors such as age, socio-economic deprivation and the prevalence of any pre-existing health conditions which could become exacerbated.

These individuals can be considered particularly vulnerable to changes in environmental and socio-economic factors (both adversely and beneficially) whereby they could experience disproportionate effects when compared to the general population.

On this basis, a precautionary approach has been applied by assuming that the population within the study area is of uniformly high sensitivity.

The criteria for defining magnitude in this chapter are outlined in Table 14.2.

Table 14-2: Definitions of Magnitude

Sensitivity	Typical Descriptors
High	Change in environmental or socio-economic factor sufficient to result in a major change in baseline population health or socio-economic circumstance (adverse or beneficial).
Medium	Change in environmental and socio-economic factor sufficient to result in a moderate change in baseline population health or socio-economic circumstance (adverse or beneficial).
Low	Change in environmental and socio-economic factor sufficient to result in a minor change in baseline population health or socio-economic circumstance (adverse or beneficial).
Negligible	Change in environmental and socio-economic factor below that for which it is possible to result in any manifest health outcome at a population level but may impact at an individual level (adverse or beneficial).

No change	No opportunity for change in health outcome or socio-economic circumstance (adverse or beneficial).

The significance of the effect has been determined by taking into account the sensitivity of the receptor and the magnitude of the impact. The method employed for this assessment is presented in Table 14.3.

Where a range of significance levels are presented, the overall assessment for each effect is based upon an evidence based expert judgement. For the purpose of this assessment, any effects with a significance level of minor or less are not considered to be significant in terms of the EIA Regulations.

Table 14-3: Assessment Matrix

Sensitivity	Magnitude of Impact				
	No Change	**Negligible**	**Low**	**Medium**	**High**
Negligible	No change	Negligible	Negligible or Minor	Negligible or Minor	Minor
Low	No change	Negligible or Minor	Negligible or Minor	Minor	Minor or Moderate
Medium	No change	Negligible or Minor	Minor	Moderate	Moderate or Major
High	No change	Minor	Minor or Moderate	Moderate or Major	Major or Substantial

14.8 Assessment

Health effects from air quality (dust and airborne particulate)

As stated in Chapter 11.0: Air Quality, there is potential for dust emissions associated with various soil stripping, extraction, processing and restoration operations, where the distance the dust will be carried depends on the wind speed, the particle size, the topography of the site and its surroundings.

It should be noted that large (>30 µm) and intermediate (10-30 µm) sized dust particles, which make up the greatest proportion of dust emitted from mineral workings, are not respirable and therefore do not constitute a credible physical health risk but could cause nuisance and associated wellbeing effects. For the non-respirable dust to be recognised as a nuisance, it has to reach noticeable levels and be persistent over time.

PM_{10} will make up a small proportion of any emitted dust in addition to vehicle exhaust emissions. However, as stated in Chapter 11.0: Air Quality, background annual mean PM_{10} concentrations for the general locality are in the range of 11.53-12.05 µg/m^3 for 2020 which is well below the objective threshold set to protect the environment and human health, and unlikely to exceed this threshold due to continued extraction activities from the proposed development.

As stated in the Response to Public Consultation Well-Being and Environmental Health Issues report (2016), there is no reason why, given proper site management, nuisance dust should be experienced outside the site. As stated in Chapter 11.0: Air Quality, these mitigation measures would also be effective in addressing the small proportion of respirable PM_{10} emissions associated with the proposed development.

Therefore, the continued application of existing designed-in and additional mitigation measures would ensure that the potential effect from dust and PM_{10} emissions on human receptors would not be significant. On this basis, the magnitude of impact on human health would be negligible, and significance of effect would be minor adverse, which is not significant.

Health effects from noise

As stated in Chapter 9.0: Noise, there are multiple sources that contribute to the overall noise output from the site. The most significant noise sources in the plant area include an asphalt plant, screen house, crusher house, primary crusher and vehicle movements. Other significant noise sources elsewhere on the quarry include the rock drill, excavator for material loading, secondary breaker and dump truck movements.

Quarry operations would continue to take place during the daytime period only (07:00 to 19:00 hours Monday to Friday, and 07:00 to 16:00 on Saturdays) where certain more noisy activities, such as blasting and drilling when working on the uppermost quarry level, are restricted to specific hours (10.00 to 16.00 Monday to Friday). This would limit the potential for sleep disturbance and associated health and wellbeing effects.

The worst-case calculated site noise level associated with temporary or ongoing operations would be 54 LAeq,1h occurring at Rogart Terrace. In all instances, predicted noise levels at the worst affected sensitive receptors would comply with the relevant ROMP condition 18 Noise Limits set to be protective of the environment and health.

As stated in the Response to Public Consultation Well-Being and Environmental Health Issues Report (2016), to mitigate the potential health and wellbeing impacts associated with noise, drilling operations on the upper bench and blast dates/approximate times are reported in advance on the quarry website. Furthermore, all new/unusual activities are reported in advance on the quarry website or, where the operator considers it appropriate, specific properties are notified. This will continue to happen.

On the basis that noise levels would comply with the relevant noise limits set to be protective of the environment and health, it is not anticipated that the continuation of activities would be sufficient to quantify any measurable adverse change in local population health outcomes. As such, the magnitude of impact on human health would be negligible and significance of effect would be minor adverse, which is not significant.

Health effects from blast vibration

Ground vibration

As stated in Chapter 11.0: Blast Vibration, a person will generally become aware of blast-induced vibration at levels of around 1.5mms^{-1} ppv and occasionally at levels as low as 0.5mms^{-1} ppv. To put this into context, vibration levels between 0.6mms^{-1} ppv and 50.0mms^{-1} ppv are routinely experienced in everyday life within a property and are considered wholly safe.

As stated in the Response to Public Consultation Well-Being and Environmental Health Issues report (2016), depending on the individual person, vibration perception associated with blasting activities can lead to concerns even at very low levels of vibration simply because the effects of the blast have been experienced. However, as stated in Chapter 11.0: Blast Vibration, in reality, vibration levels between 19mms^{-1} ppv and 50mms^{-1} ppv for open pit blasting are generally considered safe for buildings in the UK and no damage has occurred in any of the published data at vibration levels of less than 12.7mms^{-1} ppv.

Consistent with the advice on ground vibration limits from blasting set out in MTAN1, condition 23 of the current ROMP schedule of planning conditions confirms that blasting shall be undertaken in such a manner to ensure that ground vibration shall not exceed a limit of 6mms^{-1} per second in 95% of all blasts measured over any continuous six month period, where no single blast shall exceed 10mms^{-1} ppv. Monitoring of existing operations has recorded ground vibration associated with blasting activities generally in the region of between 2mms^{-1} and 3mms^{-1} ppv, with a maximum of 5.6mms^{-1} ppv recorded in one blast in August 2019. Therefore, no blast events have exceeded the ground vibration limit of 6mms^{-1} ppv at the 95% confidence level, set to protect the environment and health.

As stated in the Response to Public Consultation Well-Being and Environmental Health Issues Report (2016), perception, uncertainty and unpredictability are the primary factors associated with concern. As such, mitigation employed at the site is centred around this, ensuring good levels of

communication with the local community through advanced warnings of blasting.

As no blasting events have exceeded the vibration limit during existing operations and the same mitigation measured would continue to be employed, there is no reason to believe that future operations would do so or give rise to associated health and wellbeing effects.

Airborne vibration

As stated in Chapter 11.0: Blast Vibration, energy is transmitted from blasting activities in the form of airborne pressure waves. Airborne pressure waves above a frequency of 20Hz are perceptible to the human ear. However, most are below the audible range.

Overpressure may vibrate buildings, but actual damage caused by air overpressure is rare. Damage in the form of broken windows is possible but extremely unlikely below 140dB; more frequently, the perception of vibration, and consequently complaints, are highlighted by windows and loose ornaments rattling which is possible at 120dB. It should be noted that as meteorological conditions can influence the intensity of air overpressure levels, the level of air overpressure experienced, irrespective of how well the blast is designed, is often outside of the operator's control.

Data recorded from existing operations shows that with the exception of two blasts in January 2019, all blasts were successfully designed to facilitate meeting the 120dB upper limit of air overpressure. While the two blasts in January 2019 did exceed the upper limit of air overpressure, they were carefully designed with the intention to meet the threshold and therefore, the exceedance is likely attributed to the meteorological conditions at the time.

Overall, existing operations show that the careful design of blasts has been highly successful in mitigating air overpressure, with no material damage and associated adverse health and wellbeing effects having been recorded.

Fly-rock

As stated in Chapter 11.0: Blast Vibration, fly-rock is the unexpected projection of material from the blast site which occurs when the amount of explosive energy is greater than required.

Due to improvements in blast design technology, fly-rock incidents are extremely rare. As stated in the Response to Public Consultation Well-Being and Environmental Health Issues report (2016), while an incident did occur at a site in Brayford, Devon in 2011, the reasons for this were identified following an investigation by the HSE and procedures have been revised based on lessons learned to avoid re-occurrences.

On this basis, fly-rock incidents remain extremely rare, with any associated health and wellbeing effects from such incidents are equally unlikely.

Significance conclusion

Overall, the magnitude of impact on human health would be negligible, and significance of effect would be minor adverse, which is not significant.

Health effects from traffic nature and flow rate

As stated in Chapter 12.0: Transportation, the predicted output from the site is assumed for the purposes of this study to remain at recent levels of approximately 400,000 tonnes per annum. This equates to between 116 and 140 two-way HGV movements per average day on the local highway network.

A review of the main access route to the site confirms that the impact of the proposed development on highway capacity would be acceptable on the basis that the B4273 retains a reserve or spare capacity of at least 304 vehicles (equating to 20.2%) when applying the highest hourly flow recoded from the 2013 and 2020 traffic surveys, in the proposed 2029 design year, when operations from the site will have been very largely completed.

Regarding highway safety impacts, a review of recorded collisions over the most recent 5-year period available (which includes a period when operations

at the site were ongoing) shows that none of the recorded collisions on the routes that routinely accommodate the HGV traffic from the Quarry had any HGV involvement. As such, there is no reason to believe that the HGV activity associated with the extension of the time period for activities at the site would have an unacceptable impact on highway safety or represent an increased level of risk to health and wellbeing.

Overall, on the basis that recorded collisions are not associated with existing activities at Craig yr Hesg Quarry and therefore no highway safety impacts during the extension of time are anticipated, the magnitude of impact on human health would be negligible, and significance of effect would be minor adverse, which is not significant.

Health effects from water (hydrology and hydrogeology)

As stated in Chapter 8.0: Hydrology and Hydrogeology, the planning conditions implemented based on the findings of the 2010 ES in support of the ROMP application were deemed to be sufficient to regulate potential hydrological and hydrogeological issues and associated health and wellbeing effects (such as water contamination and flood risk).

No changes are proposed to the approved quarry development scheme to which the existing planning conditions apply, and there would thus be no changes which would necessitate a review of the existing ground and surface water management controls. On the basis that the ground and surface water controls at the site are straightforward, well established and proven effective, there is no reason to believe that future operations would give rise to associated health and wellbeing effects.

Overall, the magnitude of impact on human health would be negligible, and significance of effect would be minor adverse, which is not significant.

Health effects from socio-economic factors (employment)

As stated in the Response to Public Consultation Well-Being and Environmental Health Issues report (2016), Craig yr Hesg Quarry directly employs 19 personnel with a further 10 indirect personnel associated with haulage, maintenance and servicing etc., with between 50 and 60 external hauliers collecting material from the quarry. As of 2020, the annual wage bill at the quarry is some £1,155,000 with expenditure on contractors of around £160,000 per annum. Expenditure on spares and repairs/maintenance etc. amounts to an average of £800,000, predominantly spent on businesses with Offices in South Wales. Expenditure on plant hire amounts to an average of over £150,000 per annum, again predominantly spent with businesses with Offices in South Wales. Business rates payable to RCT average £88,000 per annum. The quarry thus directly and indirectly injects over £2 million per annum into the local economy.

The Response to Public Consultation Well-Being and Environmental Health Issues Report (2016) also states that aggregate tax is paid to the exchequer from sales of stone from the quarry. With a current tax rate of £2.00 per tonne, an average aggregates tax of £800.000 is payable per annum based upon a 400,000 tonne average annual output. A proportion of the tax was previously made available to Welsh Government to finance local community projects that generate social value in the general vicinity of quarries. As an example, £403,000 was awarded to assist the building of the Glyncoch Community Centre which is used for a wide variety of functions and classes.

The extension of time period for activities at the site would also extend the wider socio-economic benefits associated with the proposed development described above. The retention of employment would be particularly beneficial to health and wellbeing on the basis that being in good quality, long-term employment and having a stable income are two of the most important wider determinants of health.

However, while important at the individual level, the magnitude of impact on human health at the population level would be low, and significance of effect would be minor beneficial, which is not significant.

It is also to be noted that a key economic benefit of the quarry arises from the supply of high specification aggregate which is acknowledged to be a resource of UK importance. In this respect, the continued availability of supply of aggregate from the quarry for construction will be particularly beneficial as the country emerges from the Covid 19 pandemic, the importance which will

contribute to growing the economy, where construction and capital projects are anticipated to be a key feature of such growth. The closure of the quarry in 2022 would not be consistent with this economic imperative.

This is similarly the case with employment, where the retention of employment is important at a time of growing rates of unemployment arising from the Covid 19 pandemic.

14.9 Mitigation Measures

Mitigation measures focus on environmental precursors to adverse health and wellbeing outcomes, thereby intervening prior to any manifest health outcome. On the basis that no significant adverse environmental precursors have been identified which might then generate adverse health and wellbeing effects, no further health-specific mitigation measures are proposed.

14.10 Residual Impacts

As no further health-specific mitigation measures are proposed, the residual impacts remain the same as those reported in Section 14.8 (Assessment).

14.11 Recommendations

It is recommended that communication with the local community regarding early warnings continues to address adverse health and wellbeing effects associated with risk perception of blasting activities. This should continue to include advance notification of blast dates/times and any new/unusual activities.

14.12 Summary

This chapter applies a broad socio-economic model of health that encompasses conventional health impacts such as those associated with environmental health determinants (such as air quality and noise) along with wider socio-economic health determinants (such as employment) vital to achieving good health and wellbeing. The assessment methodology follows a source-pathway-receptor model to identify and assess effects that are plausible and directly attributable to the proposed development. It should be noted that a hazard source by itself does not constitute a health risk. It is only when there is a hazard source, a receptor and a pathway of exposure that there is any potential risk to human health.

The main themes of concern regarding the proposed development are anticipated to relate to noise, blast vibration and dust. The chapter seeks to address these concerns by drawing upon information detailed within the project description and relevant topic chapters. The following health determinants are assessed: air quality (dust and airborne particulate), noise, blast vibration, traffic, water and employment.

On the basis that the application is for an extension of time at an existing development rather than for the proposal of a new development, it is possible to use monitoring information from existing activities to inform the conclusions in relation to health, wellbeing and socio-economic factors.

Regarding air quality, it is known that non-respirable particles will make up the greatest proportion of dust emitted from the development. These particles are not respirable and therefore do not constitute a credible physical health risk but could cause nuisance and associated wellbeing impacts. As smaller, respirable particles will make up a small proportion of dust emitted in addition to any exhaust emissions, it is unlikely that the extension of time would cause respirable particles to exceed the relevant objective threshold set to be protective of human health.

Regarding noise, quarrying operations will continue to take place during the day which limits the potential for sleep disturbance and associated health and wellbeing effects. Furthermore, worst-case noise levels predicted would comply with noise limits set to be protective of human health. To further mitigate potential adverse health and wellbeing impacts from changes in noise, the operator will continue to publicly (and privately where appropriate) communicate particularly noisy activities in advance of them occurring.

Blasting activities have the potential to affect ground vibration and airborne vibration. From the information available from existing activities, no blasting events have exceeded the ground vibration limit set to protect human health. While two blasts did exceed the upper limit of air overpressure, no material damage or associated adverse health and wellbeing effects were recorded. Furthermore, the blasts were carefully designed with the intention to meet the threshold and therefore, the exceedance was out of the operator's control and likely to be attributed to the meteorological conditions at the time.

Due to improvements in blast design technology, incidents of fly rock are extremely rare. While an incident did occur at a site in Brayford, Devon in 2011, the reasons for this were identified following an investigation by the HSE and procedures have been revised based on lessons learned to avoid re-occurrences. On the basis that the potential for such incidents are rare, any associated health and wellbeing effects from such incidents are equally unlikely.

Updated baseline traffic flows show that the road network used by the development will continue to have spare capacity. In addition, no collisions associated with existing activities have been recorded and therefore, no highway safety impacts during the extension of time are anticipated.

Regarding the potential impact on ground and surface water, the planning conditions implemented based on the findings of the 2010 ES in support of the ROMP application were deemed to be sufficient to regulate any potential impacts. Furthermore, any water accumulation from extreme storm events would be addressed by the existing surface water management system and design capacity. As no changes are proposed to which the existing planning conditions apply, no health and wellbeing effects are predicted.

The conditions imposed on determination of the ROMP application in April 2013 would not normally be reviewed until a further 15-year period had elapsed, i.e. in 2028, corresponding approximately to the period for which the current time extension is being sought.

The extension of time period for activities at the site would also extend the wider socio-economic benefits associated with the proposed development. The retention of employment would be particularly beneficial to health and wellbeing at the individual level on the basis that being in good quality, long-term employment and having a stable income are two of the most important wider determinants of health.

14.13 Conclusions

Overall, no significant adverse health and wellbeing effects are associated with the extension of time application. In terms of policy AW10 in the RCT LDP, the time extension development would not give rise to "*a risk of unacceptable harm*" or to any "*significant adverse risk*".

Existing activities have shown that, unless out of the operator's control, exposure to environmental determinants of health would remain within objective thresholds set to be protective of the environment and human health.

There would be beneficial health and wellbeing effects from the retention of long-term direct, indirect and induced jobs associated with the extension of time application. However, while important at the individual level, this would not be measurable at the population level, and is not anticipated to be significant.

15.0 SUMMARY OF ENVIRONMENTAL EFFECTS

15.1 Introduction

The preceding chapters 6.0 to 14.0 have considered the potential environmental effects of the proposed continuation of quarrying, processing and related operations at Craig yr Hesg Quarry for the requested extended time period. The studies have drawn upon existing mitigation measures and operational practices in place at the quarry, enforceable by the current ROMP schedule of planning conditions, the Environmental Permit relating to the plant, and the discharge consent licence which regulates water discharge from the plant site area of the quarry.

These measures and practices represent well-established controls which have been proven to work effectively, and which would continue in place for the requested extended duration of operations. The existing planning conditions imposed by RCT have been deemed by RCT, via the ROMP Review, to represent modern, effective conditions which are capable of ensuring that the development continues within 'acceptable limits' and "acceptable standards" (ref PPW11 para 5.14.42, which repeats similar advice in place at the time of the ROMP determination).

Based upon the studies and content of the individual chapters, the underlying conclusion of the EIA is that the development could continue for the requested additional time period without giving rise to a 'significant' impact, and where effects could continue to be adequately mitigated based upon the existing conditions and controls.

These issues are summarised below as a brief resumé of the preceding chapters 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 assessed residual effects for the extended time period of operations.

15.2 Landscape and Visual Effects

15.2.1 LVIA Study

The main landscape and visual elements of the proposed development include continued mineral extraction within the existing quarry void / footprint of disturbance in accordance with the currently approved limits but over an extended period of time, followed by progressive and then final restoration of the site in accordance with the currently approved restoration concept plan.

The site's infrastructure, access, plant and buildings associated with mineral processing, distribution and management would all continue during operational phases as existing, but over the requested extended period of time, after which time they would be removed (unless otherwise agreed with the LPA) and the areas restored in accordance with a detailed restoration scheme based upon the restoration concept plan A057337/9a accompanying the 2010 ROMP application, updated as plan ref CYH7 accompanying this application.

These aforementioned elements form part of the currently approved working and restoration scheme, and the potential of the scheme to affect landscape character, elements and features within the site itself and also the character and visual amenity of offsite receptors in the immediate surrounding area was assessed as part of the 2010 ES.

The purpose of this current appraisal is to check and update the findings of the 2010 ES and consider the effects on landscape character and visual amenity which would arise from a continuation of the mineral extraction operation for an extended time period, with an associated delay in the implementation of the restoration strategy.

The 2010 ES concluded that the landscape and visual effects associated with the development scheme would be generally negligible / slight adverse during the quarrying operations, reducing to slight beneficial at the restoration stage. The key issue for this Appraisal is thus to consider whether these previously

assessed effects remain applicable, and whether it would be acceptable for the identified effects to continue for a longer time period.

The appraisal has been undertaken in accordance with the principles produced by The Landscape Institute and Institute of Environmental Management and Assessment's Guidelines for Landscape and Visual Impact Assessment, third edition (GLVIA3).

15.2.2 Landscape Impact

The physical disturbance of landscape elements and features at the application site as part of the extension of time for the operational phases and subsequent final restoration would be limited and neutral in nature, and in landscape terms, would not change from the approved quarry development scheme.

The physical disturbance of the approved quarry development scheme would result in the following changes to elements and features:

- progressive development of production benches up to the current edge of disturbance / approved quarry limits and basal levels, with no lateral expansion into undisturbed land;
- continued use of existing infrastructure, roads and access, plant and buildings, etc, with no new built development;
- retention of the temporary soil storage mound west of the site until such time that the material is required for restoration;
- bench treatments as part of restoration, where appropriate;
- restoration would utilise the existing soil materials in storage (and quarry waste / dust depending on availability) to provide mainly natural regeneration and mosaic of grassland, scrub and woodland cover, with exposed rock outcrops and slopes;
- there would be no visually significant or mature landscape elements or features removed or created; and
- duration of the extended workings would be short to medium-term, although certain tasks and effects would be shorter, with final restoration permanent.

Thus, there would be limited alterations to the existing landscape elements/features during working and after restoration, which results in a low degree of change to the overall character of the baseline conditions (the change is discernible but the underlying landscape character as a result of the development would be similar to the baseline conditions).

At a local level, the proposed development would not alter the current classification of the application site as an "active quarry", followed by its restoration to "sheltered valley (with mixed rocky grassland, scrub and woodland mosaic)", albeit over an extended period of time.

The development would be positioned within and would not alter the published key characteristics of the National Landscape Character Area "NLCA37 South Wales Valleys" or LANDMAP units.

There would thus be no changes to the principal findings of the LVIA undertaken as part of the 2010 ES, with the effects confined to a longer duration to complete the phased extraction programme, and a delay to the implementation of the final restoration strategy. This time extension and delay is considered to represent a slight adverse / neutral landscape effect.

15.2.3 Visual Impact

The visual baseline included in the 2010 ES described the key visual receptors in the surrounding area which the current Appraisal has confirmed to be largely unchanged.

Fieldwork was carried out to review the nature of views towards the quarry and also the degree of screening provided by vegetation and/or built up areas and buildings. Generally, this indicated that the undulating hillside and scarp slope mosaic topography, in combination with the landcover of trees and woodland in parts of the study area, significantly reduces the visibility of the existing quarry.

Screening is typically greatest to the north, west and south of the site and around the lower-lying areas and built up settlements and properties (such as west of Pontypridd, most of Glyncoch and Coed y Cwm and north-west

towards Ynysybwl and along the River Taff), or heavily vegetated areas (such as around Coed Craig yr Hesg). Views typically become more open where land is elevated and/or begins to slope away, such as the unenclosed parts of Common Land to the east (such as Leyshon Common and Cefn Eglwysilan), or where hedgerows have been clipped short or removed, from gateways and road junctions, or the edges of settlements (such as Cilfynydd).

As was the case with the 2010 ES visual assessment, potential visual receptors therefore include the following:

- inhabitants of settlements, such as parts of Pontypridd to the south, Glyncoch and Coed-y-Cwm to the north, Cilfynydd and Bodwenarth to the east and isolated residential properties and farmsteads, such as on B4273 to the east, or elevated hilltops around Leyshon Common and Cefn Egwysilan;
- users of public highways such as B4273 and A470 to the east, or the minor roads leading from the hilltops to the east;
- users of public rights of way in the local area, including Taff Trail and Celtic Trail, the Pontypridd Circular Walk and users of sections of National Cycle Routes; and
- visitors to the rugby football club and Pontypridd golf course.

The continued working at the site is not anticipated to be visible for most of the residents at Pontypridd from where views towards the site are typically obscured by intervening buildings, landform and/or wooded valley sides, in particular at Coed Craig-yr-Hesg south of the site. The exception may be glimpsed views of the plant site and primary crusher from certain elevated locations on the eastern side of the settlement, for example from the minor road leading up to Pontypridd golf course at 1.2km south-east of the site.

For residents at Glyncoch to the north, the continued working at the site is only likely to be noticeable from locations along the southern edge of the settlement, with other views are often orientated northwards away from the site. Views of the site are also typically enclosed by intervening buildings, landform and/or vegetation. The exception may be glimpsed views of the perimeter palisade security fencing, and/or mobile plant and vehicles from certain elevated locations.

Residents at Coed-y-Cwm have views typically orientated eastwards, due to the position of the settlement on the rising, western valley side. Notwithstanding the screening influence of other neighbouring buildings and/or vegetation within the settlement itself, the quarry is mostly hidden by the in-situ land to the north of the site and the vegetation around Glyncoch. The exception being glimpsed views of the top of the primary crusher, for example from Hafan Heulog at Coed-y-Cwm.

Cilfynydd is located mostly on the lower valleyside to the east of the Taff Vale, at or below 150m AOD, whilst Bodwenarth (and Coed Bodwenarth) extends over the slightly higher ground up to 190m AOD. Thus, elevated, westwards views are often gained towards the site from these settlements, although the orientation of the dwellings themselves will also affect the degree of visibility for residents, for example whether the views would be direct or indirect (or oblique). Other neighbouring buildings within the settlement and/or vegetation may further obscure views. Nevertheless, glimpsed views of upper quarry faces and the plant site and primary crusher can be obtained from certain elevated locations, for example from Oakland Terrace, Cilfynydd and Ffordd Tryweryn, Bodwenarth from where some of the upper faces of the quarry and the primary crusher are visible below the skyline and amongst the wooded valley sides. Most of the continued working in the quarry would be hidden and there would be no change to the proportion of the view occupied by the development.

Overall, the effect on views and visual amenity of the selected representative viewpoints and associated visual receptors are limited and neutral. This is primarily due to the configuration of the existing quarry and characteristics of the plant site (and primary crusher) as well as the undisturbed land and woodland, the offsite topography and vegetation cover, and with little to no change likely to be apparent. The underlying landscape character or view composition would be the same as the baseline at most locations. Continued vehicle movements would be an indirect adverse visual effect, albeit along the existing routes and road corridors.

15.2.4 Landscape and Visual Impact Conclusions

The appraisal of potential landscape and visual effects has concluded that the proposed development (extended timescale) is unlikely to be detrimental to the overall character and / or appearance of the application site and its surrounding environment.

At a local level, the proposed development would not alter the current classification of the application site as an “active quarry”, followed by its restoration to “sheltered valley (with rocky grassland, scrub and woodland)”, albeit over an extended period of time.

The proposed development would not alter the key characteristics of the Natural Resources Wales’ National Landscape Character Area “NLCA37 South Wales Valleys”.

The proposals would not reduce the existing and effective mitigation measures at the site, with existing views anticipated to be largely unchanged. This would ensure that the extended period of quarrying activities would be well integrated into the landscape and the restoration proposals would still add to the overall landscape value (whilst in the interim the site continues to provide for local roadstone requirements).

The development proposals would not cause unacceptable harm to the important landscape character of the nearby Special Landscape Area (SLA). The unspoilt valley slopes and ridges which form a visual backdrop to the settlements of the area would be unaffected by the proposed development.

Although the extension of time would delay the final restoration of the site, the existing mineral working would continue to be well integrated into the surrounding landscape, due to the surrounding topography and high woodland cover.

15.3 Ecology

15.3.1 Ecology Study

The purpose of the EcIA is to:

- describe the baseline data collection and assessment methods used;
- summarise the baseline ecological conditions including consideration of whether there have been any material changes since the EcIA undertaken in 2009 as part of the ROMP EIA, and the EcIA undertaken in 2014 as part of the western extension EIA;
- identify and describe all potentially significant ecological effects associated with the continued operation of the site;
- set out the design, mitigation and compensation measures required to ensure compliance with nature conservation legislation and to address any potentially significant ecological effects;
- identify how mitigation and compensation measures will be delivered;
- provide an assessment of the significance of any residual effects in relation to the effects on biodiversity;
- identify appropriate enhancement measures and how these will be delivered; and
- set out any requirements for monitoring.

Previous Environmental Statements provide an important source of background information for the site. EcIA’s were undertaken in 2009 (ROMP) and 2014 (western extension) which included surveys and assessments of the existing quarry (2009) and existing quarry fringe (2014). The 2009 study did not identify any ecological constraints at the existing quarry which would affect the ongoing operation.

These previous assessments have been updated via a desk study / updated data search undertaken in December 2020 and site surveys (using Phase 1 habitat classification methodology) and assessment for the potential of protected and notable species were undertaken in January and February 2021..

The baseline situation, in terms of habitats, remains as reported in the 2010 ROMP ES. There have been minor losses of peripheral habitat in the intervening period to achieve the quarry void extent, together with a degree of natural ecological succession resulting in increased scrub growth.

As a result, the conclusions reached during the 2010 ROMP application, determined in April 2013, are considered to remain valid and no additional impacts are predicted, or mitigation measures proposed.

In summary, the conclusions reached/measures previously agreed and considered valid are:

- No direct or indirect potential significant impacts have been identified upon any identified statutory or non-statutory designated sites for nature conservation. Craig-yr-Hesg / Lan Wood SINC occurs partially within the site boundary but is beyond the working area and would be complemented by the nature conservation-based site restoration.

- The presence of notable habitats i.e. those identified as priorities under Section 7 of the Environment Act Wales and the LBAP, has been identified in peripheral areas (including the identified SINC) (i.e. broadleaved woodland), although no losses would occur and no significant residual impacts are predicted.

- The potential presence of roosting bats has been identified, although the occurrence of such is considered unlikely. However, the 2010 ROMP ES set out an approach to review quarry faces during quarry development works. As some face progression would take place, this is considered to remain appropriate and has been included in an Ecological Management Plan (EMP) which would be implemented at the site.

- Common reptile species (adder, common lizard, grass snake and slow worm) have been confirmed, again this relates to peripheral areas that may be subject to minor disturbance during final restoration. An approach to reptile mitigation was set out in the 2010 ROMP which is considered to remain appropriate and is included in the EMP.

- Peregrine falcon and a range of other breeding bird species occur, this predominantly relates to presence in peripheral habitats that will be retained or subject to minor disturbance during final restoration. Working protocols set out in the 2010 ROMP with regard to peregrine falcon are considered to remain valid and is included in the EMP.

The proposed restoration reflects that approved as part of the 2013 ROMP determination. This will deliver significant habitat gains of biodiversity value for a range of species. The delivery of this restoration was not required to address any specified predicted impact to habitats or species and so a delay of six years to deliver the final restoration scheme is not considered significant or in need of any additional ecological / biodiversity compensation etc.

15.3.2 Ecology Mitigation Measures

The principal ecological mitigation measure is associated with the delivery of the restoration of the site which will create a sheltered valley (with grassland, scrub and woodland) to extend and compliment the semi-natural broadleaved woodland habitats found locally including Craig-yr-Hesg Local Nature Reserve (LNR) immediately to the south of the site, and Craig-yr-Hesg / Lan Wood Site of Importance for Nature Conservation (SINC).

In summary, the restoration will comprise:

- Quarry Bench Restoration – predominantly as natural regeneration to encourage establishment of locally occurring species from the adjacent Craig-yr-Hesg woodland; and

- Quarry Floor Restoration – following removal of quarry infrastructure (unless otherwise agreed with the LPA), the quarry floor will be reprofiled where required and a mosaic of bare ground, seasonal inundation and species-rich grassland will be created.

Mitigation measures in relation to bats, reptiles and breeding birds are included within a detailed EMP.

The 2010 ROMP application did not set out any specific enhancement measures beyond those delivered through site restoration. In recognition of advances in planning policy in the intervening time, it is now proposed to also make further enhancements during the operational period as follows:

- Erection of 20 bat and 20 bird boxes (including one barn owl box) in retained woodland habitats;
- Implementation of Japanese knotweed control programme; and
- Creation of five artificial hibernacula features suitable for reptiles during final restoration.

15.3.3 Ecology Conclusions

Overall, it is concluded that the continuation of quarrying for six years can be undertaken with full compliance with nature conservation policies at local and national level and would not result in any significant negative residual impact. Delivery of the restoration scheme will represent a positive impact.

15.4 Hydrology and Hydrogeology

15.4.1 Hydrology and Hydrogeology Study

A hydrogeological impact assessment was undertaken as part of the 2010 ES, which comprised an assessment of the hydrological and hydrogeological effects of quarrying within the existing permitted area of Craig yr Hesg Quarry. The assessment was updated as part of the 2015 ES to take into account the effects of quarrying within the proposed western extension area, in conjunction with the ongoing development within the existing quarry area.

The findings of the studies are straightforward, with the key issues being:

(i) The regional groundwater level, as measured in groundwater monitoring boreholes and experienced in the quarry void lies below the maximum base level of the quarry at 100m AOD. Quarrying to such depths has not and will not intercept groundwater.

(ii) Seepage from perched groundwater enters the void, together with direct rainfall and surface water runoff from the immediately adjoining area. This is directed by drainage channels within the quarry void into a sump at the base of the void, from where the water freely seeps into the underlying sandstone and migrates downwards to the underlying regional water table.

(iii) Surface water within the processing plant / office complex area is dealt with by an existing system of settlement lagoons and an off-site discharge regulated by NRW by a consent issued in 2013 (consent no AF4029101).

(iv) Minor spring flows feeding the Nant Tai'r-heol at Cefn and Darren-Ddu streams in the vicinity of the quarry are the only potential surface water receptors that have been identified as being at potential risk of impact from the quarry operations. However, the risk of impact is considered to be low, and any minor impact is likely to already have occurred historically as the quarry base is already well below the elevation of the springs feeding the streams.

(v) The key issue requiring mitigation measures is the potential for suspended sediment or fuel spillage to affect groundwater and surface water quality, for which standard mitigation measures are required and are in place.

15.4.2 Mitigation Measures

These findings and recommendations are reflected in the ROMP schedule of conditions which require that:

- No excavation or extraction of minerals shall take place below 100m AOD other than those works necessary for the construction of the quarry sump (ref condition 6);

- Specific measures are to be in place for the storage of oils, fuels and chemicals to ensure no accidental leakage (ref condition 35);

- Any ditch, stream water course or culvert passing through the site are to be safeguarded to ensure that drainage onto or from adjoining land is not impaired or rendered less effective (ref condition 36);

- Settlement ponds at the site are to be kept in good operational order, and no discharge is permitted of waste, oil or other pollutant to any settlement pond, ditch, stream, watercourse or other culvert (condition 37); and

- No excavation shall take place below the depth of the water table unless a Hydrogeological Impact Appraisal for dewatering and a scheme of working has been submitted to and approved in writing by the Local Planning Authority (ref condition 38): this is a contingency condition which it is not considered will become relevant since no excavation below the water table is anticipated.

The above conditions were deemed by RCT to be sufficient to regulate the hydrological and hydrogeological issues which were identified in the 2010 ES and given that there are not proposed to be any changes to the working scheme or existing drainage arrangements, these measures are considered to be appropriate to adequately safeguard ground and surface water interests for the requested extended duration of the development.

15.4.3 Hydrology and Hydrogeology Conclusions

The ground and surface water controls at Craig yr Hesg Quarry are straightforward and are well-established. No changes are proposed to the approved quarry development scheme to which the conditions apply, and there would thus be no changes which would necessitate a review of the existing ground and surface water management controls.

The conditions imposed as part of the ROMP review are thus considered to be adequate to continue to control ground and surface water for the requested extended time period.

15.5 Noise

15.5.1 Noise Study

A study of the noise effects associated with the continuation of quarrying and related operations draws upon the context provided by noise studies undertaken as part of the 2010 and 2015 ES's.

In undertaking the study, reference has been made to the current planning conditions relating to noise which were imposed as part of the Environment Act 'ROMP' Review, and guidance on the approach to noise studies and noise limits set out in MTAN1.

Routine noise monitoring has been undertaken during the daytime in April 2013, November 2013, July 2014, December 2014, June 2015, June 2016 and July 2017. All monitoring occurred during normal daytime quarry operations at the receptor locations referred to in the ROMP planning conditions.

The overall measured noise levels or the estimated site noise levels were below the site noise limits for routine operations for all four locations on each of the monitoring occasions.

Additional noise measurements during normal daytime quarry operations were undertaken in December 2020. The surveys undertaken in December 2020 have also demonstrated compliance with the current noise limits.

Further noise measurements were undertaken in March 2021. These included two sample measurements at the noise monitoring locations at Pen y Bryn and Garth Avenue during daytime hours but at a time when site operations had ceased. This was to allow noise measurements to be obtained at these locations without any contribution from site activities.

Noise monitoring also took place at the rear of 26 Conway Close comprising the installation of a sound level meter for unattended measurements between Thursday 04 March 2021 and Tuesday 09 March 2021, with consecutive 15-minute data obtained over that period. Attended sample measurements were also taken.

At Conway Close, the current noise limit is 49 dB $L_{Aeq,1h}$ determined from the baseline background levels obtained in 2009, which had an overall average of 39.0 dB $L_{A90,T}$. The results of the installed meter at 26 Conway Close in March 2021 indicate that the background level is lower with an average level of 37 dB $L_{A90,T}$. This is similar to the value measured on Saturday 18 July 2009, which had an average background level of 36 dB $L_{A90,T}$. It is proposed that a lower noise limit of 46 dB $L_{Aeq,1h}$ be adopted for this location.

The current noise limit for Pen y Bryn is 47 dB $L_{Aeq,1h}$. The noise measurements undertaken at this location, with and without the quarry operating, have resulted in similar background levels to those determined in 2009, on which the current noise limits are based. As such, there is no justification to alter the daytime noise limits for this location.

The current noise limit for Garth Avenue is 54 dB $L_{Aeq,1h}$. The recent measurements in March 2021 undertaken without quarry operations resulted in similar background levels to those determined in 2009, on which the current noise limits are based. As such, there is no justification to alter the daytime noise limits for this location.

The current noise limit for Rogart Terrace is 55 dB $L_{Aeq,1h}$. The baseline background noise levels at this location are over 45 dB $L_{A90,T}$, therefore the current limit remains valid.

Therefore, it is proposed that the Condition 18 daytime noise level criteria are carried forward for Pen y Bryn, Garth Avenue and Rogart Terrace. A reduced noise limit of 46 dB $L_{Aeq,1h}$ is proposed for Conway Close.

The noise assessment has confirmed that the existing operations are proceeding in accordance with the current noise limits, and also with the reduced noise limit proposed for Conway Close.

The limits are considered to be appropriate for the requested extended 6 year time extension.

15.5.2 Noise Mitigation Measures

Craig yr Hesg Quarry is a fully established quarry that has reached its full lateral limits. There is already embedded mitigation at the site in the form of a barrier between the site access road and Rogart Terrace. One of the most significant noise sources for some receptors is the rock drill. As extraction is complete on the top bench of the quarry, work is occurring on lower benches, which will result in the edge of the quarry providing screening attenuation.

In addition, the existing landforms around the site have the potential to provide screening attenuation.

The calculated noise levels have shown that with the existing embedded mitigation measures, current operations meet the suggested noise limits during the day. Noise from temporary operations also meets the suggested noise limit.

No additional mitigation measures are thus required.

15.5.3 Noise Conclusions

The primary focus of the application and associated environmental assessment is with a continuation of operations for a longer time period.

This noise study provides sufficient information to demonstrate that the noise levels arising from the quarry operations have been and will continued to be satisfactorily controlled. Monitoring has showed that the noise limits have been achieved at the receptor locations. This effective control will apply for the proposed longer time period.

The study provides the calculated noise levels arising from the workings and demonstrates compliance with acceptable noise level criteria at all dwellings.

The sound power levels for the calculated site noise levels are based on noise measurements of plant used on site and experience of many sites and operating quarries.

The reasonable worst case calculated site noise levels at the dwellings comply with the suggested noise limits for the daytime period 0700 to 1900 hours.

The calculated noise levels from temporary operations also comply with appropriate noise limits for such activities.

As measured and calculated site noise levels at the receptor locations are within the suggested noise limits with the existing embedded mitigation in place, no additional mitigation measures are considered necessary.

15.6 Blast Vibration

15.6.1 Blast Vibration Study

Blast vibration limits have been imposed as planning conditions at Craig yr Hesg Quarry via the ROMP Review, where the conditions reflect up to date guidance and standards set out in Welsh Government Guidance (ref MTAN1). Whilst blasting will on occasions be noticeable to members of the public (as is the case at all quarries), the limits which have been recommended by Welsh Government are set at levels which ensure that there can be no damage to residential type property, and where the effects are deemed by Welsh Government to be acceptable in amenity terms.

All blasts at Craig yr Hesg Quarry are designed by external specialist contractors under the guidance of Hanson to ensure that the limits are not exceeded. All blasts are monitored to check the success of the blast design in securing compliance with the limits. The blast monitoring results are made available to RCT and confirm that ground vibration from blasting events are being carried out in compliance with the defined ground vibration limits, with the majority of recordings well below the defined limits.

No changes are proposed to the current limits or to the current blasting practices. It follows that for the requested extended duration of quarrying at the site, blasting would continue to be regulated by the existing limits, and with all blasts continuing to be monitored. With a continuation of attention to blast design, there is no reason why blasting cannot continue to take place in accordance with the existing limits.

The blast vibration study thus recommends that the existing blast vibration limits are continued for the requested extended duration of the operations, and that all blasts continue to be monitored in accordance with the current arrangements, and with the conventional 'good practice' methodologies designed to minimise the effects of blast vibration.

The study sets out the standards and guidance relied upon, it describes the blasting process, the blast vibration monitoring which is undertaken, the 'good practice' mitigation measures which are implemented, and the recommendations for a continuation of this well-established regime.

15.6.2 Blast Vibration Mitigation Measures

No additional mitigation is considered to be required since blasting operations will be designed to continue to meet the requirements of the ROMP conditions, which themselves reflect the advice on blast vibration set out in MTAN1. The Operator's Good Practice Guide outlined in the DETR report The Environmental Effects of Production Blasting from Surface Mineral Workings is already, and would continue to be, adopted to ensure that the potential for ground-borne and airborne vibration would be minimised at the quarry.

15.6.3 Blast Vibration Conclusions

Criteria for restricting vibration levels from blasting operations at Craig yr Hesg Quarry are in place via planning conditions imposed as part of the ROMP Review, where the defined limits are set at levels recommended by Welsh Government as being adequate to minimise impacts on nearby residents.

These limits will ensure that where the proximity of residential locations is the governing factor, all vibration will be restricted to a low order of magnitude and would be entirely safe with respect to the possibility of even the most cosmetic of plaster cracks.

With such low ground vibration levels accompanying air overpressure would also be of a very low and hence acceptable level, although possibly perceptible on occasions at the closest of properties.

It should also be noted that in determining the ROMP Review application, RCT concluded that the blast vibration control measures would be adequate to regulate the development based upon the quarry development scheme as defined, and the lateral and depth limits enshrined within that scheme. The current Section 73 application is confined to a requested time extension within which to complete the implementation of that scheme. The volume of rock to be extracted annually would not change, and the frequency of quarry blast events to extract the rock would similarly not materially change - they would simply be contnued over a longer period. Given that it is not proposed to amend the approved working scheme, it follows that the existing blast vibration controls must be suitable to regulate the remaining operation.

15.7 Air Quality

15.7.1 Air Quality Study

The Air Quality Assessment has taken the same approach as the air quality assessments carried out for the 2010 ROMP and 2015 Western Extension Environmental Statements and is focused primarily on potential impacts and effects resulting from mineral dust emissions (disamenity dust and suspended particulate matter (PM_{10} / $PM_{2.5}$) arising from site activities. In addition, consideration has been included with respect to exhaust emissions (where this refers to nitrogen oxides (NOx) and particulate matter (PM_{10} / $PM_{2.5}$) arising from vehicles travelling to and from the Site.

There are no proposed changes to the current consented scheme or rate of working and as such there would not be any changes to the current processing activities, hours of operation, internal haulage or transport movements. The proposal is confined to a continuation of existing operations at Craig yr Hesg Quarry for a longer period.

The study draws upon European and UK legislation and air quality standards, notably the air quality standards and objectives designed to protect human health, dust standards and controls, and guidance and best practice regarding the control of emissions.

It considers the potential for dust, air quality and vehicle emission impacts within a defined study area and draws upon an extensive suite of air quality data assembled from air quality monitoring at and in the vicinity of the quarry. It also considers the principal sources of airborne dust associated with the on-going quarrying and excavation operations which include:

- on-going soil and overburden storage;
- mineral extraction including drilling and blasting;
- loading and tipping;
- mineral processing, including crushing and screening;
- stockpiling of product;
- internal haulage;
- site access / road transport;
- backfilling of excavation voids;
- wind blow across bare ground and stockpiles.

The study notes that the probability of dust being carried towards the key potentially sensitive receptors (the 'pathway effectiveness') has been assessed through reference to the site measured wind data, the distance and orientation of the receptors to the Site and individual sources of dust, and the presence of screening. In practice, the probability of winds carrying dust may be reduced outside the summer months, when rainfall can be typically expected to suppress fugitive dust emissions over more than one third of the time. The potential pathway effectiveness has also taken into account the local terrain and topography and in-design mitigation measures.

It concludes that at residential and other highly sensitive receptors the likely disamenity dust effects are predicted to be *negligible* at the majority of receptors to *slight adverse* at most at the old peoples' flats and adjoining residential properties.

In relation to suspended particulate matter (PM10), the study notes that IAQM guidance[20] advises that where existing background ambient PM_{10} concentrations are less than 17 µg/m^3 there is little risk that additional contributions from mineral operations would lead to an exceedance of the long-term AQAL. Defra predicted background annual mean PM_{10}

concentrations for the general locality are in the range of 11.53-12.05 µg/m^3 for 2020 (see Table 11-6), well below 17 µg/m^3.

It is therefore concluded that the Proposed Development would not result in significant adverse impacts on local air quality due to long term PM_{10} emissions. This is consistent with the RCT monitored data for Upper Garth Avenue where the annual mean PM_{10} concentrations have been consistently well below the AQO for 2015-2019 being in the range 13.45-25.1 µg/m^3.

On this basis, it is concluded that the Proposed Development would not result in significant adverse impacts on local air quality due to PM_{10} emissions, subject to the retention of the existing measures taken to manage fugitive dust, and hence also PM_{10}, emissions.

In terms of vehicle emissions, almost all HGVs travelling to / from the site do so via the B4273 to the south and Bridge Street / Ceridwen Terrace to / from the A470. All existing HGV movements are therefore through a short stretch of the Pontypridd Town Centre Air Quality Management Area (AQMA). However, these movements are already experienced on the local road network, and there would not be any increase arising from the proposals. Furthermore, it is noted that the characteristics deemed of importance to the Pontypridd Town Centre AQMA and that may have a cause in, or exacerbate, the need for the AQMA is the traffic volume and buses, with a bus station being on the nearby Morgan Street and multi-storey car park between Morgan Street and the B4273.

On the basis that there would not be any increases in existing HGV movements due to the Proposed Development, it is not considered the proposals would have any influence of the proposed amendment to the Pontypridd Town Centre AQMA, and the overall effect of quarry vehicle emissions on local air quality is deemed to be not significant**.**

15.7.2 Air Quality Mitigation Measures

The study catalogues an extensive suite of measures designed to minimise dust emission which are required to be implemented under the existing ROMP planning conditions and Environmental Permit which would continue in place for the requested extended duration of operations. These include specific measures in the northern part of the site which houses the Primary Crusher feed hopper and associated haul road which include the provision of dust suppression water sprays at the feed hopper and along the haul road accessing the hopper, and provision of a flexible curtain to the hopper.

Other standard mitigation measures are employed across the site such as the use of a water bowser to enable dust suppression on the haul routes, maintenance of speed limits and smooth-running surfaces on haul roads, and minimisation of drop heights.

The site activities will continue to be operated in accordance with the existing dust controls as specified under the extent planning permissions, along with the additional controls imposed under the Environmental Permit covering the processing operations. This includes the requirement for no visible dust emissions from the processing activities beyond the site boundary.

The existing site wide fugitive dust mitigation measures are detailed within Condition 30 of the ROMP schedule of conditions. It is proposed a Dust Management Plan (DMP) is agreed with RCT which would draw together these existing mitigation and management measures taking into account the existing planning permission and Permit controls for the continuation of the existing activities that are the subject of this planning application. Separately Hanson proposes to cease on-Site PM10 monitoring and contribute towards the costs of the RCT monitoring, subject to incorporation of the issues in a formal legal agreement.

15.7.3 Air Quality Conclusions

Overall, with the on-going application of standard good practice measures, along with the additional site-specific enhanced measures, the residual risk of adverse effects due to disamenity dust is slight adverse at most at all receptors. Daily inspections and observations, along with rapid rectification of any identified equipment malfunctions, would be continued to minimise these risks. The resulting significance of disamenity resulting from fugitive dust is not significant.

Similarly, on the basis of the PM_{10} monitoring data and subject to on-going maintenance of the existing mitigation measures taken to manage fugitive dust, it is concluded that the proposed development would not result in significant adverse impacts on local air quality due to PM_{10} emissions. The overall significance with regards to PM10 is not significant.

The proposed development would not result in the generation of additional vehicle movements on the local road network to those experienced currently. Potential adverse impacts and effects at receptors due to vehicle movements on the local highway would be negligible. The significance of residual effects associated with vehicle exhaust emissions would be not significant.

The overall significance of the Proposed Development with regards to air quality effects is not significant.

Accordingly, it is concluded that the proposed development is acceptable in terms of air quality considerations.

15.8 Traffic

15.8.1 Traffic Study

The traffic study has been undertaken in the context that the proposed development simply seeks to extend the end date for the permitted operations for 6 years followed by a further year for transportation of remaining residual stocks of processed material.

Other than the extension of the deadline for the cessation of activities, the proposal will result in no material change when compared with the existing situation in terms of output or associated traffic movements, noting that the average recent and historic annual production has been approximately 400,000 tonnes per annum.

The implicit acceptability of the continuation of traffic movements associated with Craig yr Hesg Quarry has recently been confirmed via a planning application (ref 15/0666/10) for a western extension to the site, which was proposed to maintain supplies for some 25 years. The planning application was refused in July 2020, on the grounds that quarrying operations would fall within 200m of sensitive properties without sufficient justification, but the refusal did not relate in any way to highways impacts.

In this context, the study describes the geometry of the site access, which has been improved pursuant to a planning permission granted in 2014 to provide for two-way HGV traffic, and the pattern of HGV movements confirming that almost all HGVs travelling to/from the Quarry do so via the B4273 to the south of the site, where they continue to Pontypridd before heading east to join the A470 at its grade-separated roundabout interchange, at which point they distribute primarily towards the south.

The study draws upon traffic surveys undertaken in 2012 and 2013, and an updated survey in December 2020 which provide data on peak, weekday and 7 day flows along the B4273 to the south of the quarry.

In summary, the 2012 survey confirmed that during the weekday working hours of the Quarry (07:00 – 19:00) the 5 day average flow during the operating hours was 9,222 vehicles, of which 742 (8%) were HGVs.

The 2013 survey confirmed a 3 day average flow during the operating hours of 9,301 vehicles, of which 739 (7.9%) were HGVs. The HGV proportion during the 3 weekdays surveyed averaged 7.3%, which equates to 847 vehicles per day.

The total traffic volumes between the two surveys are thus broadly similar, where during some periods of the 2013 survey the traffic volumes were higher and vice versa.

A new traffic survey was undertaken, at the same location as the previous surveys, between Friday 27 November and Thursday 03 December 2020 using an Automatic Traffic Counter. This period fell between the lockdowns imposed in Wales, when travel was not restricted. During the weekday working hours of the Quarry the 5 day average flow during the operating hours was 7,777 vehicles, of which 288 (3.7%) were HGVs.

By comparing the 2020 survey data with that recorded during 2012 and 2013, it is apparent that the daily and peak hourly flows are lower, as are the number of HGV movements. It is likely that these reductions are a result of seasonal variations, suppressed travel arising from the Covid 19 outbreak and potentially the closure of White Bridge, as vehicles divert to other routes when leaving the residential estate it connects to.

Based on the 847 recorded HGV movements per day during the 2013 traffic survey, the percentage of HGVs attributable to Craig yr Hesg Quarry is calculated to be approximately 16.5% based on 140 movements per day associated with an average payload of 20 tonnes, reducing to 13.7% based on the higher payload of 24 tonnes, which results in an average of 116 movements per day at the Quarry.

Due to the lower traffic flows recorded during the 2020 ATC survey, it was found that the proportion of Craig yr Hesg Quarry HGVs within the total HGV flow, assuming all Quarry HGVs travelled to / from the south of the access, thereby crossing the ATC site, varied between approximately 4% on Saturday and 32.9% on Friday.

Based upon design capacity published in TA 79/99 "*Traffic Capacity of Urban Roads*", the current peak hour flows on the B4273 represent approximately 67% of the design capacity of the B4273, leaving a reserve capacity of approximately 33%. Applying traffic growth factors to 2029 (to reflect the time extension application period), the B4273 would retain a reserve or spare capacity of at least 304 vehicles (20.2%) in the 2029 peak hour. Road capacity is thus not a material concern regarding the determination of the time extension request.

15.8.2 Traffic Mitigation Measures

A designed – in mitigation measure has already been implemented via the construction of the new two-way access to the quarry which delivered improved visibility and geometry at the connection to the B4273.

The existing road network currently accommodates the traffic associated with the activities at Craig yr Hesg Quarry, which are assumed to continue as existing for the life of operations associated with the proposed time extension.

As has been established, the existing road network retains sufficient capacity to accommodate the traffic and has a sufficient level of geometric design to facilitate safe access, as demonstrated by the lack of accidents involving HGVs within the study area in recent years.

In general terms, the highway network is therefore considered to be acceptable, and no geometric improvements are required to accommodate the ongoing activities at Craig yr Hesg Quarry beyond routine maintenance of the new quarry access road and its visibility splays.

15.8.3 Traffic Conclusions

Following completion of the review of the highway and transport implications of the proposed development it is concluded that:

- The recently improved site access is acceptable to serve the proposed development;
- The quantum of proposed development traffic is already accommodated on the local road network, which has been demonstrated to retain substantial spare capacity; and
- There are no recent records of accidents involving HGV's in the vicinity of the quarry or on the identified access route to/from the A470.

Accordingly, it is concluded that the proposed development is acceptable in terms of highway and transport considerations.

This conclusion has been implicitly supported by RCT as it raised no objection on highway grounds when considering the previously proposed western extension to Craig yr Hesg Quarry, in circumstances where the proposal predicted continuation of the same activities at the site for an additional period of 25 years.

15.9 Cultural Heritage

15.9.1 Cultural Heritage Study

Cultural Heritage Assessments were undertaken as part of the 2010 EIA /ES submitted to accompany the ROMP Review application, and the 2015 ES which accompanied the western extension application.

In summary, the studies noted that no cultural heritage features are recorded within the site and the quarrying operations undertaken will have removed any unrecorded archaeological remains which may have existed. There would thus be no direct archaeological effects associated with a continuation of the quarry development for the requested extended time period and no mitigation is required with regard to any potential archaeological remains.

The topography and screening provided by the development confirms that the Listed Buildings located to the north-east of the site are separated from the site by extensive modern development, and therefore the proposed development will not affect the settings of these assets.

Similarly, the effects of topography, screening provided by the existing quarry and woodland to the south of the site, together with the location of the Listed Buildings south of the site within an urban environment is such that the ongoing development will not have the potential to affect the setting of these designated heritage assets.

No mitigation measures are thus required with regard to impacts upon designated heritage assets, as the ongoing development will not affect the settings of Listed Buildings located within the environs of the site. This is evident from the absence of conditions in the ROMP schedule relating to cultural heritage interests.

15.9.2 Cultural Heritage Conclusions

There are no proposals to amend the quarry development scheme or the existing footprint of the already developed area. It follows that there would be no additional effect on any potential below ground archaeological features and no change to the absence of any effect on the setting of listed buildings in the general vicinity of the quarry.

These circumstances would not change by virtue of the requested extended time period to complete the development.

16.0 ENVIRONMENTAL CONTROLS AND COMMITMENTS

16.1 Context

The ES provides an assessment of the environmental effects of the development on a topic basis, with the respective chapters confirming, where necessary, the mitigation measures which would be employed to minimise the environmental and amenity effects of the development. These draw upon the measures already in place at the quarry, which are regulated by existing planning conditions imposed via the ROMP Review, which could be re-imposed as part of a time extension permission.

The chapters also highlight a series of well-established and effective mitigation measures and commitments which are already employed at the existing quarry as part of conventional good-practise measures. These issues have been brought together in a schedule of monitoring, mitigation measures and commitments summarised in Table 16.1 below.

Whilst the majority of the items are regulated by existing planning conditions, certain items are controlled by separate legislation and requirements, notably the controls which are in place via the Environmental Permit which regulates the processing plant, asphalt plant and related activities, and the water discharge consent which is in place as part of the existing surface water management arrangements.

In addition, a number of site management controls are implemented independently by Hanson, which are included within Table 16.1 for completeness, and which underpin the commitment to operate the quarry in a way which minimises environmental and amenity effects.

All drivers are issued with a haulier induction which details site rules and procedures, including adherence to speed limits and the sheeting of loads. Compliance with the rules is mandatory. Any drivers found to be not complying will be issued with a warning, and repeat offenders will be banned from the Quarry. Hanson has also developed a Drivers Handbook in collaboration with the Mineral Product Association, as a tool for working drivers to help them understand and manage the risks that they face and create when driving and operating vehicles for work, and to help people make safer choices about the way they drive and behave around vehicles.

This is re-enforced by the fact that the entire Hanson haulage fleet has achieved a ‘gold standard award’ under the Fleet Operator Recognition Scheme (FORS). This scheme is aimed at ensuring that operators work lawfully and to best practice, and covers staff training, incident and collision rates, road safety, relationships between commercial vehicles and other road users. In view of the best practice standards which are enshrined in the scheme, local authorities and major contractors often specify the use of FORS accredited companies for their supply chains.

RCT as the regulatory body currently undertake a minimum of one full inspection and 2 x check inspections of the aggregates processing plant, asphalt plant and related operations which are regulated by an Environmental Permit. This frequency can be changed dependent on the established risk rating of the installation.

Air Quality has been monitored by Hanson and by RCT, and in the event that permission is granted for the requested time extension, then Hanson will be prepared to make a financial contribution towards the cost of ongoing air quality monitoring by RCT, similar to the commitment made during the consideration of the western extension application.

All blast monitoring data is made available to RCT upon request, and the date and times of blasts are posted in advance on the Quarry web site.

RCT are able to undertake monitoring of compliance with planning conditions via site inspections, where Regulations provide for the cost of the inspections to be borne by Hanson. Separate inspections are undertaken by the Mines and Quarries Inspectorate. The operations at the quarry are thus fully regulated and controlled by well established procedures.

Following local community feedback on the proposed western extension development, Hanson have taken the initiative to set up an enhanced Craig yr

Hesg Quarry website which allows the regular posting of information regarding operations at the quarry. It is hoped that it will be of assistance in providing advanced notification of activities, and thereby avoid operations taking place which may give rise to concern simply because they are unannounced. In essence, the approach seeks to allow the community and quarry to co-exist with a greater flow of information between the two, and in a way designed to reduce anxiety founded on a lack of knowledge of the quarry and related activities.

These measures include the following:

(i) All blast dates and proposed times of blasting are set out on the enhanced website (albeit the precise time of the blast will be subject to operational and safety factors).

(ii) Direct notification of blast times can be provided to named individuals in the local community via emails if required.

(iii) All complaints (whether noise or any other topic) are recorded, investigated, actioned, and the complainant notified, as a continuation of established procedures.

(iv) All new / unusual activities will be reported in advance on the website,

(v) Subject to cooperation from others, Hanson are happy to arrange visits by local schools to explain the work which is undertaken at the quarry, the importance of it, and, the safety issues and hazards which exist.

(vi) Hanson would also be willing to consider the views of the local community at the restoration stage when final details of the restoration proposals are prepared (and which will require to be submitted as a condition of a planning permission, similar to the requirements of the current restoration planning conditions).

In the spirit of seeking constructive dialogue with representatives of the Local Community, Hanson have made attempts to re-establish a Quarry Liaison Group, which would also include representatives of RCT. This would provide a forum for issues and concerns to be discussed, for information to be provided on progress with the quarrying operations, for any site improvements to be explained, for monitoring records to be reviewed, and for any remedial or proactive measures to be discussed. This would also provide an opportunity for Hanson to explain the mechanics of ISO14001 (referred to above) which requires constant assessment and improvement separate to the planning regulatory process which is more geared to compliance with existing requirements and standards.

However, this initiative has not progressed on the basis that local community representatives were not prepared to participate while the western extension application remained undetermined. The final outcome of that application will be determined via an appeal, but in the meantime, and in the context of the time extension request which forms the subject of this ES, Hanson remains of the view that the re-establishment of a Quarry Liaison Group would be beneficial, and in the event that planning permission is granted, they will renew their efforts to re-establish such a Group. However, ultimately, dialogue is a two-way process and Hanson cannot take positive initiatives to involve the community without the cooperation of the community.

Consistent with this, the Mineral Products Association (MPA) of which Hanson is a member has published a Charter aimed at raising standards and improving perceptions. A key element of the initiative is to engage fully with local communities and to strive to be good neighbours. This is to be actioned by a commitment that all quarries will prepare and implement a Community Engagement Plan. Hanson, as a MPA member will respond positively to this initiative, but again, community engagement is a two-way process, and its success will depend upon the cooperation of the local community.

In the context of the above. there is an extensive suite of mitigation measures in place at the quarry, which have been proven to work effectively, and which would be capable of continuing for the relatively limited additional time period requested as part of the Section 73 application. There is also a commitment to constructively engage with the local community during the remaining period of operations at the quarry. The key measures are summarised below:

Table 16-1: Schedule of Mitigation Measures/ Environmental Commitments

ISSUE	MONITORING / MITIGATION MEASURES / COMMITMENTS
General Management Measures	
	(i) **Quality Management System and Environmental Management System** in place at the quarry, the latter accredited to the international standard ISO14001, which includes pro-active management systems to minimise environmental and amenity impacts and which require strict adherence to the terms of the planning permission and Permits. 1. **(ii)** **Planning Conditions Monitoring**: there is provision in Regulations for a programme of regular monitoring visits to be undertaken by RCT Officers, at Hanson's cost, to check adherence to requirements of planning conditions. 2. **(iii)** **Quarry Plant Pollution Prevention and Control Permit Monitoring**: programme of regular monitoring in place by RCT Officers to check adherence to the requirements of the permit and assess the 'risk rating' of the installation.
Site Management Measures	
	(i) **Daily visual assessment of emissions,** on an internal Hanson pro-forma (**Appendix 16.1**) which includes the dust extractor stack; water sprays; process buildings; conveyors; dust shed; stockpiles; loading; haul roads, wheel wash, and entrance road / exit (including sprays), with a record of any action required, action taken, and date completed, all recorded daily.
	(ii) **Daily general site inspection checklist,** again on a Hanson pro-forma (**Appendix 16.1**) which includes inspections of haul roads, edge protection, emissions, site security, compliance with internal traffic management, and adherence to vehicle sheeting requirements, with a record of any action required, action taken, and date completed, all recorded daily.
	(iii) **Weekly general site inspection checklist,** again on a Hanson pro-forma (**Appendix 16.1**) which includes inspections of signs, condition of structures, and cleanliness of site entrance notice board with a record of any action required, action taken, and date completed.
	(iv) **Complaints Register:** all complaints are logged, investigated, actioned as appropriate, and the complainant notified of the outcome, with a full written record retained.
Ecology	
	(i) Restoration strategy designed to improve biodiversity interest with a range of new habitats at the site to offset the loss of the relatively low value habitats within the extension area.
	(ii) Restoration land uses will provide enhanced habitats for bats and invertebrates.

	(iii) Watching brief to ensure no disturbance to Peregrine falcon within the existing quarry.
	(iv) Ecological Management Plan / Wildlife Protection Plan submitted with the Section 73 application
Hydrology and Hydrogeology	
	(i) Modern system of 8 x surface water settlement lagoons in place within plant site area.
	(ii) Discharge from lagoons regulated by NRW permit (reference AF4029191) which imposes limits on discharge rates at various flows, and on suspended solids.
	(iii) Detailed controls in place via current planning conditions to ensure no surface or groundwater contamination from fuel oil spillage (reference condition 35 of 08/1380/10)
	(iv) Drainage measures implemented on upgraded access road to ensure no surface water flow onto the public highway (reference conditions 9 and 10 of permission 13/1039/10).
Noise	
	(i) The plant will also be properly maintained in accordance with the manufacture's instructions.
	(ii) 'Smart' warbling or broadband reversing alarms will be fitted to all mobile plant, to avoid the use of reversing bleepers.
Maintenance Items	**(iii)** The existing noise management plan for the current quarry will continue as follows 3. (a) Review the condition of plant cladding and repair/replace where necessary (b) Review the condition of the chute work and rubber lining and repair/replace where necessary (2 monthly) (c) Inspect all haul roads for potholes etc (monthly) (d) Quarry vehicle to have reversing warblers not bleepers.
Procedural items	**(iv)** Quarry primary crusher not to start before 0700
	(v) Road sweeper not to be used on public highway at quarry entrance / exit before 0700
	(vi) Any noise complaints received must be recorded on the Hanson complaints log system
	(vii) Driver guidelines sheet to be regularly issued especially during any sustained operations for the production of coated roadstone outside the normal quarry operational hours (reference condition 14 of 08/1380/10)
	(viii) Machines which are in intermittent use will be shut down in intervening periods, or throttled down to a minimum.
	(ix) Plant will be operated in an efficient and responsible manner with respect to the minimisation of noise emissions e.g. by minimising drop heights of materials when loading, and avoidance of unnecessary revving of engines etc.

	(x)	All internal hall roads will be kept well maintained with speed limits imposed to reduce vehicle speeds and minimise noise from e.g. “body slap” from empty vehicles.
	(xi)	Regard will be paid to the choice of rock drill to be used to ensure that the noise limits imposed can be adhered to.
	(xii)	Quarry benches to be maintained with a minimum face height of 7m (and the maximum of 15m) to provide a noise barrier.
	(xiii)	Planning conditions could be imposed to restrict the time for drilling on the uppermost rock head to 10.00 – 1600 Monday to Friday.
Blast Vibration		
	(i)	All blasting to be designed to ensure adherence to the blast vibration limits set out in Condition 23 of 08/1380/10, namely blasting to be undertaken to ensure that ground vibration does not exceed a peak particle velocity (PPV) of 6mm per second in 95% of all blasts measured over any continuous 6 month period, with no single blast to exceed a PPV of 10mm per second.
	(ii)	Maximum use to be made of electronic initiation system for blasting, which has been demonstrated at Craig yr Hesg to reduce ground vibration levels compared to historic blasting practice.
	(iii)	All blasts to be designed with charge weights to ensure adherence to the blast vibration limits which are proposed.
	(iv)	Current air overpressure design objectve of 120dB imposed as Condition 24 of 08/1380/10 could be re-imposed for the extension development or alternatively a best practice scheme for the minimisation of air over pressure would be prepared and adopted which is the approach recommended in MTAN1.
	(v)	Blasting times (10.00 – 1400 are clearly advertised at the quarry)
	(vi)	All blasts will continue to be designed to follow the advice in the DETR report on the environmental effects of production blasting from surface mineral workings, namely: 1. Making accurate surveys & recording of blast area as per the Quarries (Explosives) Regulations 1988. 2. Ensuring correct blast design including correct relationship between burden, spacing and hole diameter. 3. Ensuring accurate drilling, keeping sub-drill to the minimum required. 4. Making accurate surveys & recording of blast holes as per the Quarries (Explosives) Regulations 1988. If necessary, blast design would be revised in light of survey data. 5. Maximising use of free faces including by careful planning of delay sequences.

	6. Optimising maximum instantaneous charge weight by: Reducing number of holes; Reducing instantaneous charge by decking charges (if necessary); Reducing bench height or hole depth; Reducing borehole diameter. 7. Optimising blast ratio in any changes to design. 8. Where practicable ensuring direction of detonation away from sensitive areas. 9. Wherever possible use of unconfined charges would be avoided particularly where fissures or broken ground or weaken of rock from previous blasting is known to be present. 10. Wherever possible the use of surface lines of detonating cord would be avoided. All surface detonators and explosives would be adequately covered with suitable material. 13. Stemming material would be of sufficient quality and quantity to confine adequately all explosives upon detonation. A coarse stemming material such as angular chippings should be considered. Drill fines would not be used. 14. Bottom initiation would be considered in preference to top initiation. 13. Misfire procedures would have due regard to under-burdened charges. 14. If air overpressure is found to be a potential problem consideration would be given to reducing blast panel area. 15. Blasting to be undertaken as far as possible at regular times. 16. Ground and airborne vibration levels would be monitored regularly so that information may be employed into any necessary modifications of future blast designs.
	(vii) All blasts will continue to be monitored at nearby sensitive properties.

Air Quality / Dust (Summary of mitigation measures – see also list of measures in es Section 11.6)		
General Management	**(i)**	All operations to be conducted to reflect best practice guidelines appended to the Environmental Effects of Dust from Surface Mineral Workings (DOE 1995).
	(ii)	All operations associated with processing and secondary treatment of aggregate will be undertaken in accordance with the existing environmental permit conditions.
	(iii)	All operations will accord with the Hanson Environment Management System.
	(iv)	Hanson to liaise with RCT to deliver any other changes or improvements which can be made to minimise the impact of dust
Mitigation Measures Soil Handling and Restoration	**(v)**	Soil handling to be undertaken during appropriate weather conditions
	(vi)	Water Bower to be used on stripped surfaces or other areas of bare ground to minimise effects of wind blow
	(vii)	Drop heights from excavator to be minimised
	(viii)	Dry surfaces at highest point of quarry to be treated as necessary with rain gun attached to water bowser
Haulage	**(ix)**	Main access route to be conditioned as necessary by water bowser and / or emplaced fixed water sprays under dry conditions (noting that there are currently four fixed water sprays on the access road).
	(x)	Routes to be provided which avoid abrupt changes in horizontal and vertical alignment.
	(xi)	Regular compaction, grading and maintenance of haul routes.
	(xii)	Speed limit of 10mph to be enforced.
	(xiii)	All site vehicles to be fitted with upswept exhausts and radiator fan shields.
	(xiv)	Dump trucks to be evenly loaded to prevent spillage.

Transportation		
	(i)	No changes proposed to recent/historic rates of output.
	(ii)	Historic quarry access closed (except for emergencies) and replaced by new two-way access/entrance which is now fully commissioned (reference planning permission 13/1039/10).
	(iii)	All HGVs to pass through wheel wash before exiting the site.
	(iv)	All loads carrying -75mm stone to be sheeted.
	(v)	Road sweeper to be utilised on quarry access / entrance road as required.
	(vi)	Surface water drainage arrangements on access / entrance road to be monitored and maintained as appropriate.
	(vii)	Areas of hardstand and paved roads within the site will be regularly cleaned to minimise the risk of dust leaving the site.
	(viii)	All surfaced site roadways will be kept clean or damp by means of a water bowser.
	(ix)	Access road / site entrance cleaned with a road sweeper when necessary and in response to any complaints regarding mud or other detritus on the public highway.

17.0 PLANNING POLICY

17.1 Introduction

In considering the applicability of planning policy to the proposed development, it is important to emphasise that the requested time extension would not be associated with any changes to the current quarrying practices or processing arrangements or to the restoration concept for the site. Planning permission for the development is already in place via the four planning permissions for quarrying which are extant at the site, and via the ROMP Review which, by not restricting the terms of the current permissions, implicitly endorsed the acceptability of the ongoing quarry development scheme.

The Section 73 application is confined solely to the duration of the operations, and a desire the extract the remaining currently permitted reserves which would otherwise be sterilised if, as is currently the case, quarrying is required to cease by 31st December 2022.

This is of particular significance at Craig yr Hesg Quarry where the reserves are acknowledged to represent a source of high specification aggregate (HSA) which itself is of UK importance because of its particular aggregate properties and the limited UK supply of such material.

The key focus of planning policy is thus a consideration of whether it is acceptable for the quarrying operations to continue for the requested additional duration, and whether this is desirable and acceptable in planning policy terms.

17.2 The need for the development

17.2.1 Minerals Technical Advice Note 1: Aggregates (MTAN1)

The consideration of the need for the development is not in relation to the additional reserves which would be provided by the development, but the permitted reserve of some 2.5m tonnes which would be lost and removed from the landbank if quarrying ceases in December 2022 with remaining reserves unworked.

MTAN1 confirms that the overriding objective of planning policy for aggregate provision is to ensure that supply is managed in a sustainable way so that the best balance between environmental, economic and social considerations is struck, while making sure that "environmental and amenity impacts of any necessary extraction are kept to a level that avoids demonstrable harm to interests of acknowledged importance" (reference paragraph 7).

It seeks to meet this objective via 5 principles of 'sustainable minerals planning' set out in the then Minerals Planning Policy Wales and reiterated in Planning Policy Wales Edition 11 (PPW11 - ref section 5.14). This includes the goal to provide aggregate resources in a sustainable way to meet society's needs for construction aggregate in line with objectives to, inter alia, "*ensure planning permissions for futures primary extraction are essential and properly planned for in accord with the Regional Technical Statement*" (RTS), reference MTAN1 'Principle A'.

MTAN1 highlights the limited availability of certain aggregates, such as high specification aggregates (HSA) for road construction that have the ability to provide particular levels of surface skidding resistance and durability. The Pennant Sandstone outcrop in South Wales, of which the mineral resource at Craig-yr-Hesg Quarry is a part, is identified as a resource of UK importance which, notwithstanding the 'proximity principle' may justify transportation over long distances because of the national need for the provision of the specific type of material with limited availability (MTAN1 paragraph 42). The RTS, 2008 (discussed below) further noted that this implies that, given suitable safeguards, additional levels of extraction to meet this particular need should be encouraged e.g., as a means of regenerating local economies.

MTAN 1 provides advice on the landbank of permitted reserves which should be maintained for aggregates, with a reference to a minimum 10 year landbank for crushed rock to be maintained during the entire development plan period (para 49). It continues by noting that where landbanks already provide for more than 20 years extraction, new allocations in development plans will not

be necessary, and mineral planning authorities should consider whether there is justification for further extensions to existing sites or new extraction sites as these should not be permitted save in rare and exceptional circumstances. This may be justified, for example, where supply of an aggregate of a particular specification is clearly demonstrated..... (ref para 49).

The advice in MTAN 1(2004) has been modified by a Statement issued to the Chief Planning Officers of LPAs in Wales by the Welsh Minister for Housing and Regeneration (25th July 2014), as part of the formal endorsement of the Regional Technical Statement 1st Review (discussed below). This notes in relation to MTN1 para 49 that this was drafted at a time when it was presumed that a plan period would be 10 years. This pre-dated the onset of LDPs and LDP periods of 15 years. The letter thus notes that "*the implication is that it may not be sufficient to conclude that having a 20 year or more landbank will result in the required minimum landbank throughout the plan period. Therefore, it may be prudent to come to this conclusion only if there was in place a landbank of 25 years or more. This letter clarifies that it is where landbanks already provide for more than 25 years of aggregates extraction that new allocations will not be necessary*".

This advice also needs to be considered in the context of the recognition set out in MTAN1 that the Pennant Sandstone in South Wales should be treated as a "special case" in terms of supply, and where, as noted above, MTAN1 urges planning authorities to recognise the UK importance of the resource (ref para 42).

17.2.2 Planning Policy Wales Edition 11 February 2021 (PPW11)

Similar advice is set out in PPW11 which notes that high specification aggregates are of importance to the UK and that "*the UK and regional need for such minerals should be accorded significant weight provided environmental impacts can be limited to acceptable levels*" (ref para 5.14.23). It is the Applicant's case that environmental impacts are currently being limited to "acceptable levels" via the comprehensive schedule of planning conditions imposed by the ROMP Review (and the separate controls in place via the quarry Permit), and that the request for a time extension is thus entitled to be accorded the 'significant weight' referred to.

PPW11 also confirms that it is "essential to the economic health of the country that the construction industry is provided with an adequate supply of the minerals it needs" (para 5.14.22).

In terms of ensuring supply' PPW11 confirms that:

> *"Ensuring the sustainable supply of minerals is a strategic issue which plays a fundamental underpinning role in supporting non-minerals development. Each mineral planning authority should ensure that it makes an appropriate contribution to meeting local, regional and UK needs for primary minerals which reflects the nature and extent of resources in the area and their best and most appropriate use, subject to relevant environmental and other planning considerations. For aggregates this should be done under the aegis of the North and South Wales Regional Aggregates Working Parties, whose role is to provide a regional overview of supply and demand and through the framework provided by the Regional Technical Statements for Aggregates*" (ref para 5.14.10).

It continues by noting that:

> *"The contribution that a resource could make to UK demand where the mineral is of limited or restricted supply or regional demand must be taken into account when taking planning decisions*……." (ref para 5.14.11)

This is of relevance to the HSA available at Craig yr Hesg Quarry, and the importance of ensuring that the remaining permitted reserves are not sterilised.

17.2.3 Regional Technical Statement (RTS)

MTAN 1 requires the two Regional Aggregate Working Parties (RAWPS) in Wales to produce a Regional Technical Statement (RTS) to ensure that adequate supply can be maintained, taking into account the sustainability objectives set out in MTAN1. The relevant parts of the RTS should then be

incorporated into the individual development plans of the respective Authorities (reference paragraph 50).

A RTS for the area covered by the South Wales RAWP was produced in October 2008. The RTS considered future demand in the region based upon the existing permitted reserves at the RTS base date (December 2005), using both existing consumption patterns and a 'per capita'/population approach. The regional assessment of demand was then 'apportioned'/subdivided between the constituent MPA's as the contribution towards regional aggregate demand which they should make via allocations in their LDPs.

It is important to emphasise that the assessment of future requirements set out in the original RTS and subsequent revisions (discussed below) all assume the availability of the permitted reserves in the existing quarries.

In relation to RCT, the RTS concluded that early consideration should be given to the need to allocate additional reserves likely to be required in the later part of the 15 year plan period (ref recommendation in section 4.28).

Consistent with the context provided by the RTS, the adopted LDP (2011) makes provision for a western extension to the quarry within a 'preferred area of known mineral resources' (ref Policy SSA 25).

A 1st Review of the RTS (RTS1) was published in August 2014 and provides a general strategy for the future supply of aggregates based on a minimum supply requirement of 25 years (15 year period of the RTS + 10 year minimum crushed rock landbank at the end of the 15 year period). It then includes recommendations to each Mineral Planning Authority regarding the minimum quantity of crushed rock aggregate which needs to be provided for within their area (minimum provision), and the total tonnage for any new allocations which need to be made in their Local Development Plans to meet that minimum provision.

These calculations are based upon average sales over a 10 year period (2000 - 2010) and the amount of permitted reserves (landbank) available at 31st December 2010, again noting that for RCT this included the full permitted reserve at Crag yr Hesg Quarry.

Particular mention is made in RTS1 of 'high specification aggregate' (HSA) which serves different markets and is required for distribution over greater distances, notably the skid resistance aggregates derived from the Pennant Sandstone which are essential for road surfacing applications throughout England and Wales (ref RTS1 para 2.8).

In relation to circumstances in RCT, the Regional Annex does not differentiate between general rock aggregate from limestone quarries within RCT (Forest Wood and Hendy Quarry), and the high specification aggregate (HSA) from Craig yr Hesg, but assumes combined ongoing sales of some 0.69m tonnes of rock per annum (sandstone and limestone). This results in a requirement as at December 2010 for a minimum provision of 17.25m tonnes of rock, calculated over the 25-year time horizon. When compared with a landbank of 13m tonnes at December 2010, this gave a residual requirement for a minimum allocation in the RCT LDP of 4.25m tonnes (again assuming the availability of the full permitted reserve at Craig yr Hesg).

The RTS1 Regional Annex further notes that a new permission for an extension to Forest Wood Quarry has been granted since December 2010 and a preferred area has been identified in the LDP (Craig yr Hesg). It thus concludes that the crushed rock shortfall is already covered by the permission and allocation and that no further allocations are specifically required by the RTS.

MTAN1 requires the RTS to be reviewed at 5 yearly intervals, and a final version of an RTS Second Review (RTS2) was issued in October 2020. It was endorsed by the Minister on 24th March 2021, and when endorsed by the LPAs it will form the basis of mineral resource provision to be made in LDP reviews, noting that a LDP review for RCT is scheduled to progress during 2021.

RTS2 indicates an annual requirement for RCT of 0.753m tonnes of crushed rock, which for the 25 year provision period of RTS2 (15 years plus a minimum 10 year landbank at the end of the period), requires a minimum provision for RCT of 18.816m tonnes. With permitted reserves of 9.83m tonnes as at 31st December 2016, this equates to a residual requirement to make an allocation

for 8.986m tonnes of new crushed rock reserves in the forthcoming review of the RCT LDP.

Again, it should be emphasised that the calculation included in RTS2 is based upon an availability of the full remaining permitted reserve at Craig yr Hesg Quarry. If a reserve of some 2.5m tonnes is sterilised at Craig yr Hesg by virtue of being unworked at December 2022, then the residual requirement identified in RTS2 would increase by circa 2.5m tonnes to 11.486m tonnes.

It should be further noted that the currently identified 8.896mt requirement is a minimum required allocation as at the end of 2016. The replacement LDP for RCT is scheduled for adoption in 2024, by which time the Authority's crushed rock landbank will have reduced by 8 years from the position at 2016 which equates to some 6.0m tonnes if consumption remains at around 0.75mt per annum.

This re-enforces the importance of ensuring that existing permitted reserves are fully utilised in making a contribution to supply requirements, with added importance at Craig yr Hesg in terms of the HSA which the quarry provides.

Finally, in July 2019 the South Wales Aggregates Working Party (SWAWP) published a 2018 Annual Report setting out information on sales and reserves as at 31st December 2018. The reserves figure for RCT are combined with those for Merthyr Tydfil CBC where there are substantial reserves in the administrative area of Merthyr' which distorts the combined figure.

However, without disclosing a reserve figure, the Report indicates a landbank of permitted reserves in RCT of between 12 and 14 years based on average sales of 0.78m tonnes over a 3 year period (2016 – 2018) and 0.72m tonnes over a 10-year period (2009 – 2018). Taking the 12 year landbank as an example, with average sales of 0.78m tonnes over a 12 year period, this indicates a permitted reserves of 9.36m tonnes at December 2018 (i.e. 12 x 0.78). (This is broadly consistent with a reserve figure of 9.83m tonnes at December 2016, as quoted in RTS2)

With a continuation of this sales figure the reserve would reduce to 6.24m tonnes at December 2022, giving a landbank of 8 years. With the removal of the unavailable reserves at Craig yr Hesg Quarry of some 2.5m tonnes from December 2022, the permitted reserve would reduce to 3.74m tonnes and a landbank of only 4.79 years.

This is evidently very substantially below the MTAN1 requirement to maintain a landbank of at least 10 years, and, as discussed below, would be contrary to policy in the adopted RCT LDP.

This is a compelling reason in its own right to ensure that the currently permitted remaining reserves at Craig yr Hesg are not sterilised from December 2022 and thereby removed from the landbank, particularly in the context of the quality of the reserves involved.

17.3 The Development Plan

Section 38(6) of the Planning and Compulsory Purchase Act 204 introduced a requirement that planning applications should be determined in accordance with the development plan, unless material considerations indicate otherwise: in effect a presumption in favour of granting planning permission for developments which are in accordance with the development plan. This principle has continued through subsequent planning policy iterations, and, as discussed below, is at the heart of the most recent version of Planning Policy Wales, Edition 11 (PPW11).

The development plan in relation to the appeal site is the Rhondda Cynon Taf Local Development Plan (LDP) adopted in March 2011.

The key LDP policy of relevance to Craig yr Hesg is SSA25 which Plan makes provision for a western extension to the quarry within a 'preferred area of known mineral resources'. The allocation of the 'preferred area' as an extension to Craig yr Hesg Quarry is the only allocation of land for future aggregates production made in the LDP, which the Plan relies upon as part of RCTs contribution to regional supplies as required by MTAN1 and the RTS. Continuity of extraction at Craig yr Hesg Quarry thus represents the primary minerals strategy of RCT via the LDP. It follows that the release of the reserves at the Craig yr Hesg extension site is central to ensuring the required continuity of aggregate supply and the delivery of the LDP minerals strategy.

A planning application for the extraction of reserves within the preferred area was submitted in May 2015 but refused by RCT in July 2020. An appeal against the decision has been lodged, and a decision will be made by the Planning Inspectorate in due course. As noted in the introduction section of this ES, the extension development incorporated the remaining reserves in the existing quarry as part of an extension and consolidation scheme, and the application incorporated a request for a time extension to recover those reserves. The current Section 73 time extension application would have been unnecessary if the extension and consolidation application had been permitted.

This will be a matter which will be addressed separately, but the mineral strategy of the LDP re-enforces the importance of Craig yr Hesg Quarry. Not only does the Plan allocate an extension to the quarry as the only such mineral allocation in the LDP, but implicitly it relies upon the extraction of the remaining permitted reserves at the quarry as part of the LDP mineral supply strategy. The time extension to recover these reserves would thus be fully in accordance with the mineral strategy of the development plan.

Policy CS10 includes a commitment to contribute to the local, regional and national demand for a continuous supply of minerals, without compromising environmental and social issues by "maintaining a minimum 10 year landbank of permitted rock aggregate reserves throughout the plan period (to 2021) together with an extended landbank in the form of a Preferred Area of Known Mineral Resource" (i.e. the Craig yr Hesg extension area).

As noted above, in the absence of a permission for a western extension to the quarry (via an appeal) there will be a very substantial shortfall below the minimum 10 year landbank at December 2022, which a time extension to allow the extraction of otherwise sterilised reserves would help to address.

The accompanying text notes that minerals impact upon all aspects of our lives, providing resources for construction, roads, energy and our household and commercial needs (ref para 4.90). It continues by recognising that 'quarrying can have major impacts upon the environment and landscape and yet are crucial to the nation's economy' (para 4.91). It thus confirms that 'the LDP minerals policies will balance the need for safeguarding of nationally, regionally and locally important mineral resources whilst considering their appropriate extraction against the potential impact of such development on residential and sensitive receptors, the landscape and on sites of nature conservation importance' (ref para 4.92).

That balancing exercise resulted in the allocation of the preferred area as an extension to Craig yr Hesg Quarry as an area for 'appropriate extraction'. However, it also informed the judgments made at the time of the determination of the ROMP application, where RCT concluded that updated planning conditions could be imposed to minimise identified impacts. Those measures could continue for the requested extended duration of operations.

In a similar way, Core Strategy Policy CS10 seeks to ensure that impacts upon residential areas and sensitive land uses from mineral operations and transportation are limited to an 'acceptable proven safe limit'. It is evident that in their determination of the ROMP Review application, RCT concluded that planning conditions could be imposed which met the planning policy test of minimising impacts to within 'acceptable proven safe limits'. As noted above, this established and successful mitigation regime could continue for the requested extended duration of operations.

The supporting text refers to the wider need to consider effects on the landscape and on sites of nature conservation interest. This is re-enforced by Policy AW5 which requires that there should be "no significant impact upon the amenities of neighbouring occupiers".

A similar theme is included in policy AW10, which confirms that development proposals will not be permitted where they would cause or result in a risk of unacceptable harm to health and / or local amenity because of, inter alia, air and noise pollution, "*unless it can be demonstrated that measures can be taken to overcome any significant adverse risk to public health, the environment and / or impact upon local amenity*". Again, the identified issues have been fully considered as part of the EIA, and measures are available and in place via the ROMP schedule of conditions to ensure that the ongoing development will not give rise to "significant adverse risk'.

Policy AW8 confirms the need for new development proposals not to cause harm to features of a Site of Importance for Nature Conservation (SINC) or other locally designated sites, unless, inter alia, the proposal will not unacceptably impact on the features of the site for which it has been designated.

There is a designated Local Nature Reserve (LNR) within the woodland to the south of the existing quarry (partly within land where the rights to quarry were relinquished as part of the 1993 Craig yr Hesg Quarry extension permission), but there would be no direct or indirect effect on this Nature Reserve.

The application site includes a small area of the Craig yr Hesg / Lan Wood SINC which comprises an extensive area to the south west of the application site. The small area of the SINC within the application site lies outside the defined mineral extraction area and would not be affected by the quarry extension.

Finally, Policy SSA23 identifies 'Special Landscape areas' which cover large parts of the rural area of RCT, and where development will be expected to conform to the highest standards of design appropriate to the character of the area. The SLA boundary in the vicinity of Craig yr Hesg Quarry has been drawn such that it excludes the quarry and there would thus be no mineral development within the defined SLA area.

The theme of policy designed to protect the amenities of sensitive properties is not that amenity impacts should be eliminated, but that impacts should be minimised to an 'acceptable proven safe limit' (LDP policy CS10), ensuring no 'significant' impact or adverse risk. Similar themes are set out in MTAN1 and PPW with reference to ensuring that effects are mitigated to within 'acceptable levels' (MTAN1 para 85); to 'acceptable limits' (PPW10 para 5.14.2); and to an 'acceptable standard' (PPW para 5.14.42).

It is contended that these requirements are fully discharged via the mitigation measures enshrined within the proposed development scheme and regulated by existing planning conditions. These conditions have been proven to work effectively in minimizing impacts and could readily continue for the relatively short additional timescale of operations requested by the Section 73 application.

17.4 National Policy

17.4.1 Planning Policy Wales Edition 11 (PPW11)

PPW11 issued in February 2021 represents a minor redrafting of PPW10 to provide advice on 'the socio-economic duty' on public bodies introduced by the Equalities Act 2010 (ref para 1.17), issues arising from the Covid pandemic (ref paras 2.21-2.23), and a number of other minor drafting amendments, but it makes no substantive alterations to the previous PPW10 issued in December 2018. PPW10 was itself redrafted from the previous PPW9 to ensure that it was fully aligned with the sustainable development requirements of the Planning (Wales) Act 2015 and the well-being goals defined in the WBFGA which underpin sustainable development. Consistent with PPW10, PPW11 seeks to build upon the five ways of working set out in the WBFGA, noting that the planning system is one of the key policy decision making and delivery mechanisms, and it should seek to maximise the delivery of outcomes against all aspects of well-being/sustainable development, thus seeking the maximise the contribution towards the goals of the WBFGA.

It sets 5 key principles for planning of:

(i) Growing our economy in a sustainable manner;
(ii) Making the best use of resources
(iii) Facilitating accessible and healthy environments
(iv) Creating and sustaining communities
(v) Maximising environmental protection and limiting environmental impact (ref PPW10 Figure 3).

Central amongst these principles in this case are the benefits of supply of aggregate which underpins economic growth; making the best use of resources by not unnecessarily sterilising reserves; the economic benefits of the development help in sustaining communities; and ensuring a continuation

of ongoing environmental protection via the established measures in place at the quarry.

The guiding principles of minerals planning policy set out in PPW11 are:

> *The role of the planning authority in relation to mineral extraction is to balance the fundamental requirement to ensure the adequate supply of minerals with the protection of amenity and the environment. The key principles are to:*
>
> - *provide positively for the safeguarding and working of mineral resources to meet society's needs now and in the future, encouraging the efficient and appropriate use of high quality materials;*
> - *protect environmental and cultural characteristic of places, including those highly cherished for their intrinsic qualities, such as wildlife, landscapes, ancient woodlands and historic features, and to protect human health and safety and general well-being;*
> - *reduce the impact of mineral extraction and related operations during the period of working by ensuring that impacts on relevant environmental qualities caused by mineral extraction and transportation, for example air quality and soundscape, are within acceptable limits; and*
> - *achieving, without compromise, a high standard of restoration and aftercare so as to avoid dereliction and to bring discernible benefits to communities, heritage and/or wildlife, including beneficial after uses or opportunities for enhancement of biodiversity and the historic environment (para 5.14.2).*

The time extension to allow the recovery of remaining reserves would meet the requirement to 'provide positively' for the working of minerals to meet society's needs; the existing quarry has inbuilt environmental safeguards;, impacts are reduced and controlled via the ROMP schedule of conditions; and a high standard of restoration will be achieved via the approved restoration concept which will bring discernible benefits.

PPW11 further notes that:

> *Mineral working is different from other forms of development in that:*
>
> *• extraction can only take place where the mineral is found to occur;*
>
> *• it is transitional and cannot be regarded as a permanent land use even though operations may occur over a long period of time; ……* (para 5.14.4).

In the case of the requested time extension, it is thus not a case of assuming that the required aggregate can be derived from an alternative location, noting that no such provision for the extraction of sandstone has been made at any other location within RCT. In addition, the requested extended time period is consistent with a recognition that the operation is transient and not permanent.

Finally, additional context is provided by paragraph 5.14.42 of PPW11, namely:

> "*Mineral workings should not cause unacceptable adverse environmental or amenity impact. Where this is not possible working needs to be carefully controlled and monitored so that any adverse effects on local communities and the environment are mitigated to acceptable limits. Any effects on local communities and the environment must be minimised to an acceptable standard"* (re para 5.14.42).

This is consistent with themes set out in MTAN1 and the LDP regarding the control and mitigation of environmental effects, with respect to which it is evident that the ROMP schedule of conditions is successful in mitigating effects to an acceptable standard.

17.5 Planning Policy Conclusions

PPW11 recognises that mineral extraction can only take place where the mineral is found to occur; it is transitional even though operations may occur over a long period of time; and any adverse effects on local amenity and the environment need to be mitigated to "acceptable levels" and "acceptable standards" (para 15.14.42). A similar test is set out in the development plan

with the requirement to mitigate effects to within an "acceptable proven safe limit" (ref policy CS10) and to avoid "significant" impact (policy AW5) and "significant" adverse risk (policy AW10).

The language of the development plan and PPW11 recognises that it is unlikely that the environmental effects of mineral extraction can be fully eliminated, and the requirement is thus to mitigate the environmental impacts of mineral extraction and to "carefully control and monitor" effects (PPW11 para 5.14.42).

The potential amenity and environmental effects have been considered in detail in the ES and in the previous consideration and determination of the ROMP application which culminated in a decision notice with a comprehensive schedule of environmental and amenity protection conditions. These conditions in turn have proven to be successful in mitigating impacts to within acceptable levels and acceptable standards.

Notwithstanding this conclusion on the way in which environmental effects can be "carefully controlled", planning policy requires that the determination of a planning application needs to consider wider issues as part of an overall planning balance. Uppermost in this is the acknowledged need set out in PPW11 to provide mineral resources to meet society's needs and to maintain '*a steady and adequate supply of minerals*' (para 5.14.1). Moreover, and of significance to the HSA available at Craig yr Hesg Quarry, is the requirement that the UK and regional need for such minerals should be accorded '*significant weight'* provided environmental impacts '*can be limited to acceptable levels'*. (ref para 5.14.23). It is contended that environmental impacts could be limited to '*acceptable levels'* in this case, they do not present any material risk to public health, and that the project is thus entitled to be accorded the '*significant weight'* referred to.

PPW11 also requires Planning Authorities to "provide positively for the working of mineral resources" (para 15.14.2), and "each mineral planning authority should ensure that it makes an appropriate contribution to meeting local, regional and UK needs for primary minerals which reflects the nature and extent of resources in the area " (ref para 15.14.10).

Craig yr Hesg Quarry is the only operational sandstone quarry in RCT, and it is relied upon as part of the LDP minerals supply strategy. A permission for an extension of time to recover currently permitted reserves would be entirely consistent with this strategy.

The underlying requirement of the development plan and PPW11 is to ensure that a proper balance is struck between the need for minerals and the protection of existing amenity and the environment. In this case, there is a compelling case of need to ensure that the reserves are not sterilized by virtue of a time constraint, and the environmental effects can be successfully minimised to "acceptable limits", and do not constitute any material risk to public health. It is also important to note that these effects are known, rather than predicted, which reduces uncertainty regarding the nature of effects.

The overall planning policy conclusion is that the development would be in accordance with the development plan in terms of the mineral supply strategy of the Plan, but also in terms of the individual environmental protection policies which have been assessed. The development is thus entitled to a presumption in favour of planning permission being granted (ref Section 38(6) of the Planning and Compulsory Purchase Act 2004).

In addition, in terms of a wider planning balance, the weight to be afforded to the need for the development; the importance of continuity of supply; the special quality of the high specification aggregate; the economic importance of the development in terms of supply of the high specification aggregate; the absence of any material public health impact and the socio economic benefits of the development through maintained direct, indirect, induced and catalytic income and employment, are such that the balance should fall heavily in favour of the scheme.

18.0 CONCLUSIONS

This ES provides a detailed and objective analysis of the potential environmental effects which would be associated with a request to extend the end date for the extraction of sandstone at Craig yr Hesg Quarry from 31st December 2022 to 31st December 2028.

There are remaining reserves at the Quarry of some 3.3m tonnes as at 31st December 2020. Assuming a continuation of recent sales of 400,000 tonnes per annum, then, in the absence of a permission to extend the life of the quarry by the requested 6 years, a reserve of some 2.5m tonnes would remain unworked at the quarry as at December 2022.

The reserves at the quarry are able to produce a high specification aggregate, suitable for exacting road surfacing specifications, and are acknowledged to be a resource of UK importance. Planning Policy Wales (Edition 11) confirms that the UK and regional need for such minerals should be accorded "significant weight", with MTAN1 confirming that such reserves should be treated as a "special case" in terms of supply. MTAN1 also urges planning authorities to recognise the UK importance of the resource. The sterilization of existing permitted reserves of such a resource would be contrary to these principles and would not be in the interest of sustainable minerals planning.

The importance of this is re-enforced by the need for economic growth as the country emerges from the Covid pandemic where supply of aggregates is a key component of the construction industry which is a key element of such growth. Placing unnecessary restrictions on the supply of aggregate (particularly high specification aggregate) would be wholly illogical and inappropriate in these circumstances.

The RCT LDP makes provision for a western extension to Craig yr Hesg Quarry as the only allocation of land for future aggregates included in the LDP. Continuity of extraction at Craig yr Hesg Quarry thus represents the primary minerals strategy of RCT via the LDP, and the ability to be able to extract existing permitted reserves at the quarry (via the requested end date extension) would be entirely consistent with that strategy.

In the absence of a permission for a time extension, the RCT landbank of permitted reserves would reduce to some 3.74m tonnes representing a landbank of only some 4.8 years at December 2022. This would be very substantially below the MTAN1 requirement to maintain a landbank of at least 10 years throughout the period of the local development plan, and would be contrary to similar landbank policy commitments in the adopted RCT LDP.

This is a compelling reason in its own right to ensure that the remaining permitted reserves at Craig yr Hesg Quarry are not sterilised from December 2022 and thereby removed from the landbank, particularly in the context of the quality of the reserves involved.

The Quarry has been in existence since the late 1800's and has been operated in its current form for several decades. The quarry has reached its full lateral and depth limits, and a phased quarry development scheme and restoration strategy (via the ROMP Review) is in place. No changes are proposed to the approved quarry development and restoration scheme. Similarly, no changes are proposed to the current working practices or processing arrangements, or to the controls on the plant separately in place via an Environmental Protection Act Permit

The existing planning conditions imposed via the ROMP Review have been deemed adequate by RCT to regulate the ongoing operation, and it is only proposed to amend those existing planning conditions in so far as is necessary to allow a further 6 years of mineral extraction at the site. The existing planning conditions which regulate hours of working, noise, blasting, dust and air quality, and surface water and groundwater protection would thus be unchanged and would remain in place to regulate the operation for the additional timescale requested.

The ES concludes that the existing planning conditions remain appropriate to regulate the development for the requested extended time period.

The ES also highlights a suite of mitigation measures and other controls which are in place at the quarry, and which would continue to be implemented as 'good practice' measures and some additional measures designed to minimize the effects of the ongoing operation.

CONCLUSIONS 18

All quarry developments will give rise to some degree of environmental effects, and this is inevitable given the nature of the operations which are involved. However, the requirement of national planning policy (PPW11) and the advice in MTAN1 is to ensure that effects are '*minimised*' and maintained '*within acceptable limits*'. It is important to note that in this case, these effects are known, rather than predicted, which reduces uncertainty regarding the nature of effects.

The conclusion reached by the ES is that the ongoing development could continue whilst minimising the environmental effects, and that the existing and proposed substantial package of mitigation measures would ensure that the effects of operations are maintained "*within acceptable limits*".

In this context it is respectfully requested that, as advised by PPW11, RCT should '*provide positively for the working of mineral resources*' by granting permission for the requested time extension.

The Planning Policy section of the ES concludes that the development would be in accordance with the development plan in terms of the mineral supply strategy of the Plan, but also in terms of the individual environmental protection policies which have been assessed.

In all these circumstances it is considered that there should be a firm presumption in favour of permission being granted (ref Section 38(6) of the Planning and Compulsory Purchase Act 2004).