DRYBROOK QUARRY
Renewal of Planning Permission

Environmental Statement
Non Technical Summary
Volume 3

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1.0 INTRODUCTION

1.1 Background

A planning application has been submitted to Gloucestershire County Council (GCC) which seeks planning permission for the renewal of the existing planning permission for quarrying at Drybrook Quarry. The purpose of the application is to extend the time period for completing extraction at Drybrook Quarry by 10 years.

Drybrook Quarry is located within the administrative area of Forest of Dean, Gloucestershire. The Quarry lies to the immediate north-west of the village of Drybrook, some 2km west of Mitcheldean, and some 6.5km south east of Ross on Wye. The location of the site is illustrated on Figure 1.1.

Drybrook Quarry is a long established limestone quarry, which commenced operation in the 1920’s. The formal planning history dates back to 1946 (an Interim Development Order Permission), with western and southern extensions to the original quarry permitted in 1962 and 1972. In November 1989 permission was granted for a limited deepening of the quarry by 10m.

In December 1989 a planning application was submitted for a further western extension of the quarry, with the ‘red line’ application site boundary drawn to encompass the original quarry. The application included the relocation of the processing plant into the quarry and additional environmental improvements. Following a refusal of the application by Gloucestershire County Council (GCC) in March 1990, planning permission was ultimately granted by the Secretary of State in January 1992 following an appeal and public inquiry.

The 1992 planning permission anticipated the extraction of some 6.5 million tonnes of limestone, at an average rate of 325,000 tonnes per annum over the 20 year period. The planning permission was implemented on 28th April 1994, and pursuant to Condition (ii), the permission will expire 20 years from the date of commencement i.e. on 28th April 2014.

In 2009, Drybrook Quarry was “mothballed” due to the economic recession which had a major impact on the construction sector and ultimately the minerals industry as a key supplier to the sector. The quarry currently remains in a mothballed condition, with approximately 1.8 million tonnes of reserves permitted under the 1992 planning permission remaining to be worked. The current application therefore seeks to extend the time period specified under the 1992 planning permission by 10 years to enable the completion of extraction at Drybrook Quarry.

The current application proposes no changes to the boundary of the permitted quarry area, as defined by the 1992 planning permission. All future quarrying will take place within the existing quarry footprint by working the quarry faces and benches back to the lateral limits of the permitted area, and to a floor level of 175m AOD (which is above the water table). This scheme will release the remaining reserves of some 1.8 million tonnes. Similarly the current application will not alter or seek to intensify the current and historic pattern of vehicle movements from the quarry or the rate of output (which will be dictated by market conditions).

The submission of the renewal application will however allow GCC to impose up to date planning conditions on the ongoing operation which reflect modern standards and requirements.

1.2 The Non Technical Summary

An Environmental Impact Assessment has been undertaken to consider the environmental effects of the quarrying and related operations at Drybrook Quarry. The results are presented in an Environmental Statement which accompanies the planning application. This document is a non technical summary (NTS) of the Environmental Statement (ES), and presents the main findings of the Environmental Impact Assessment (EIA) in non technical language. The NTS, as the title
Non Technical Summary

suggests, provides only a brief summarised account of a large amount of technical reports and data.

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

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

• Volume 1: Environmental Statement (ES);
• Volume 2: Technical Appendices;
• Volume 3: Non Technical Summary of the ES (i.e. this document);
• Volume 4: Landscape and Visual Impact Assessment Figs
• Volume 5 Planning Application Statement, incorporating application plans

1.3 Technical Studies

The content of the EIA and the respective technical studies has been informed by informal discussions held with GCC, by Hanson’s experience of operating the quarry, and by the external consultancy services employed by Hanson.

The EIA and the preparation of the ES has been coordinated by SLR Consulting Limited. SLR are members of the Institute of Environmental Assessment and Management, with an awarded ‘Quality Mark’, and have specialist capability in mineral planning. As part of the EIA, and as informally discussed and agreed with GCC, specific technical studies have been undertaken to consider the effect of the ongoing development in terms of:

• Ecology
• Hydrology and hydrogeology
• Noise
• Blast Vibration
• Air Quality
• Traffic
• Cultural Heritage

In addition, technical inputs on the design of the working scheme, geology and reserve assessment, have been provided by in-house expertise at Hanson.

1.4 Document Availability

The ES volumes are available for inspection at the offices of Gloucestershire County Council, Shire Hall, Westgate Street, Gloucester, GL1 2TG.

Copies may be purchased from SLR Consulting Ltd, Beignon Close, Ocean Way, Cardiff CF24 5PB.

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

• Volumes 1 - 5: (Printed versions) £100.00
• Volumes 1 - 5: (CD version) £5.00
• Volume 3 NTS: (Printed version) £5.00
Figure 1-1 - Site Location Plan
2.0 LOCATION AND MAIN FEATURES

Drybrook Quarry is located to the north-west of the village of Drybrook in the Forest of Dean, some 2km west of Mitcheldean, and some 6.5km south east of Ross on Wye.

The application site covers the full extent of the surface area of the existing permitted quarry. The permitted site area at Drybrook Quarry site extends to approximately 32.67 hectares and the main features of the quarry comprise:

(i) The permitted quarry extending westwards into remaining permitted reserves, comprising a series of faces and benches developed down to a level of 175m AOD at the eastern end of the quarry and between 199m AOD and 210m AOD at the western end. The levels on the quarry rim reach some 260m AOD along the northern edge of the quarry, and 220m AOD along the southern edge;

(ii) Fixed, enclosed crushing and screening plant sited within the quarry at the 185m AOD level;

(iii) Stockpile areas for processed aggregate located in the eastern section of the current base of the quarry at 175m AOD;

(iv) Additional stockpile area at 210m AOD on the northern bench of the quarry;

(v) Quarry sump located at the western section of the current base of the quarry at a slightly lower level than the 175m AOD quarry base;

(vi) Perimeter screen bunds, circa 8m to 10m high along the southern and eastern boundaries;

(vii) A quarry reception area located at the eastern end of the permitted boundary adjacent to Hawthorns Road, comprising the gated site access, a surfaced yard, weighbridge and administrative office building, wheelwash, vehicle workshop and electricity substation; and

(viii) An agricultural lime plant located at 210m AOD in the north-eastern corner of the quarry.

3.0 THE PROPOSED DEVELOPMENT

3.1 Introduction

Drybrook Quarry is operating on the basis of a planning permission granted by the Secretary of State in 1992. The planning permission imposes conditions controlling operations and requiring the implementation of measures aimed at reducing environmental effects, and specifies an end date relating to the completion of quarrying.

The current application does not incorporate any additional land that does not currently enjoy the benefit of an existing planning permission for quarrying. It therefore does not seek any lateral or vertical extension to the quarry beyond the currently approved limits. The function of the renewal application, as the term indicates, is to extend the end date of the existing planning permission by a period of 10 years, with the objective of allowing quarrying to continue to enable extraction of the currently permitted reserves, where those reserves are recognised as making a valuable contribution to the County’s landbank of permitted reserves of aggregate material for the construction industry.

3.2 Phasing

The quarry has been designed to progress in two generalised phases, illustrated in the quarry development plans, which are reproduced at a smaller scale in this NTS as figures 3.1 – 3.3. The figures illustrate:

- The main quarry features as at present (figure 3.1);
- Intermediate Quarry Development - Phase 1 (figure 3.2); and
- Final Quarry Layout (figure 3.3).
3.2.1 Existing Quarry

The eastern half of Drybrook Quarry has been exhausted of permitted reserves. The remaining permitted reserves, which are estimated to be in the order of 1.8 million tonnes, are located in the western half of the quarry.

Considerable development has taken place in the western half of the quarry since the 1992 planning permission, with the upper levels of reserves having been developed in a series of 3 benches, which are illustrated in figure 3.1.

The uppermost bench (220m AOD) has been developed around the western half of the quarry. It is intended to develop this bench laterally in a westerly and southerly direction within the proposed limit of extraction in order to maximise recovery of the underlying reserves.

The 210m AOD bench is a wide development platform, ranging from 50m to 80m in width, and containing significant reserves. This bench will be developed laterally to the north, west and south in order to release the underlying reserves.

The current basal level of the western half of the quarry is located at 200m AOD, albeit this level does slope down to 197m AOD at its boundary with the eastern half of the quarry, which has been fully developed.

When the 220m AOD and 210m AOD benches have been laterally extended, it is proposed to develop the 200m AOD bench both laterally and vertically, which will enable the development of 2 further benches below at 186m AOD and the quarry floor at 175m AOD.

The vertical development of the western half of the quarry will not only maximise the extraction of the permitted reserves, but will also ensure that the basal level of the western half of the quarry lies in with the 175m AOD basal level of the eastern half of the quarry, resulting in a uniform quarry profile for restoration.

3.2.2 Phase 1

Phase 1 of the quarry development is depicted in figure 3.2. During the development of the western half of the quarry there will be no alterations to the location or extent of the processing plant and ancillary built environment.

The proposed quarry development is defined within the proposed limit of extraction (dashed green line), which encompasses the remaining permitted reserves within the western half of the quarry.

Development in Phase 1 will focus on the lateral working of the benches in the western half of the quarry in a “top down” manner. The uppermost bench (220m AOD surface) will be developed approximately 20m to the west and 25m to the south in parts, which will enable greater access to the 210m AOD bench. The 210m bench will then be developed approximately 50m to the west, 40m to the south and 25m to the north which will enable access to the 200m AOD bench.

During the lateral development in Phase 1, the haul road access ramp from the 210m AOD northern bench will be re-aligned to release permitted reserves along the northern face of the quarry.

The Phase 1 development will result in a larger basal surface area at 200m AOD which will enable the vertical development of the western half of the quarry to be undertaken in a safe and viable manner.

3.2.3 Final Quarry Development

Figure 3.3 illustrates the final layout of Drybrook Quarry upon the completion of extraction of the permitted reserves within the western half of the quarry, which is consistent with the extant scheme.

Upon completion of the Phase 1 intermediate development, the western half of the quarry will be developed both laterally and vertically over 4 benches.
The southern face of the quarry will be developed to a relatively steep benched profile, with a lateral distance of approximately 30m between the quarry base (175m AOD) and the uppermost bench (220m AOD). A bench width of 5m will be retained to ensure safe passage along the benches for restoration and future aftercare works.

The developed bench profile of the western and northern faces will be of a lesser gradient than the southern face. Whilst the upper 3 benches will be consistent with the southern face benches at the western quarry face, the bottom bench (circa 186m AOD) will be approximately 70m wide to accommodate the final profile of the quarry.

The final location of the benches along the northern quarry face within the proposed limit of extraction will be developed to achieve a bench width of between 25m and 30m, creating a gentler benched profile than that achieved along the southern and western faces.

The floor of the final quarry development will be located at 175m AOD, with the western half of the quarry, tying in with the current quarry floor level at the eastern half of the quarry. The final 175m AOD quarry floor level will measure approximately 385 m along its east-west axis and between 30m and 80m along its north-south axis. The final quarry profile will provide for a uniform restoration profile.

### 3.3 Processing Plant

Stone extracted from the quarry will be transported from the quarry face by dump trucks to the fixed processing plant, which was relocated to the lower levels of the quarry in accordance with the 1992 planning permission. As a result of its relocation, the processing plant is now very well screened from the vast majority of surrounding views. The plant structures will remain in this well-screened location until the site has been fully worked out.

The stone will continue to be worked using conventional methods, with stone being released from the working face via controlled blasting and placed into dump trucks by a long arm excavating shovel before being transported and placed into the primary feed hopper which is located at the western end of the processing plant. The material is then fed into a primary crusher which reduces the size of the limestone. The resulting material is then fed through a secondary crusher and series of screens to produce the required single size of stone products. These are then fed by conveyors to initial stockpiles located to the immediate south of the processing plant at the base of the quarry. Surplus stock is relocated to the stockpile area bench at 210m AOD on the northern face of the quarry.

The extraction, crushing and screening operation has been regulated by a Local Authority Pollution Prevention and Control – Part B Permit (reference PPC 42/95) issued by Forest of Dean District Council and renewed on an annual basis. The permit imposes restrictions and requirements relating to the control of dust emissions from the plant, stockpiles and haul roads, and which requires management and monitoring designed to minimise dust emissions. The Permit is likely to be re-issued on the re-commencement of operations which will continue the previous controls over the operation of the plant.

No changes to these established arrangements are proposed as part of the current application.

### 3.4 Hours of Operation

Condition v) of the current planning permission confines mineral extraction and associated operations to the hours of:

- 0700 to 1700 Mondays to Fridays
- On Saturdays, activity is restricted solely to the maintenance of plant and machinery between the hours of 0700 to 1600.

Additional restrictions apply to drilling operations carried out above ground level (condition vi) and blasting (condition xvi).

The current application does not seek to modify the current permitted hours which would be applied across the permitted quarry area.
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3.5 Output and Traffic Movements

There are no restrictions on output imposed as conditions on the current planning permission, and output and traffic movements are thus dictated by market conditions and customer demand.

Drybrook Quarry has been mothballed since 2009, but production in the 5 years prior to 2009 ranged between 280,000 and 300,000 tonnes per annum. For the purposes of the traffic assessment, as a result of likely timescales associated with the determination of the planning application, and the need for re-commissioning of the plant for production and market fluctuations, a nominal future output of 250,000 tonnes per annum has been assumed for future production.

Based on 250 working days per annum and an average payload of 20 tonnes per vehicle, the production and distribution of 250,000 tonnes of limestone would result in 50 loads / 100 HGV movements per day on the local road network.

Based on a historical 60/40 distribution to the north/south of the site access, this equates to 30 loads (60 movements) to the north and 20 loads (40 movements) to the south. Based on the 10 hour working day, this equates to 6 movements per hour (one every 10 minutes) to the north of the site and 4 movements per hour (one HGV every 15 minutes) to the south of the site. However, traffic movements have varied over time, with, on occasions, a 10% north / 90% south distribution. This equates to 5 loads (10 movements) to the north and 45 loads (90 movements) to the south. These issues are discussed further in Chapter 12.0 of the ES.

The traffic travelling to/from the north continued through Puddlebrook and Bailey Lane End up to the junction with the A40. The traffic travelling to/from the south follows Hawthorns Road/Drybrook Road to its junction with Morse Road, then south along Morse Road to its intersection with the A4136/A4151 at Nailbridge, which is known as Plump Hill.

Once at the A class routes, the development traffic distributes east and west towards the respective markets.

3.6 Water Management

The development of the permitted reserves at Drybrook Quarry will not have any significant direct effect on the surface water flows and flood risk from surface waters within the study area, either during future quarrying activities or during decommissioning, given the following:

- there will be no change to the lateral extent of the quarry footprint from current existing conditions; and
- the site infrastructure will not be significantly altered from the established layout at the quarry.

The development will not have any significant effect on groundwater flow within the bedrock groundwater storage area (aquifer), either during future quarrying activities or during decommissioning, given the following:

- no active dewatering or groundwater management will be required;
- groundwater flow will continue to take place below the quarry floor via the underlying bedrock aquifer;
- should groundwater levels rise above the quarry floor level due to unusually high rainfall recharge conditions, groundwater will be continue to flow across the floor of the quarry unhindered, both during the operational and restoration phases;
- should groundwater levels rise above the floor of the quarry under unusually high rainfall recharge conditions, the slow rate of water levels rise in the base of the quarry will allow sufficient warning for quarry vehicles and personnel to leave the affected areas.

Given the rapid infiltration rates associated with the high permeability of the rock and shallow depth below ground surface of the bedrock aquifer, there is no requirement for a formal surface water management scheme around the quarry perimeter or in the base of the quarry.
3.7 Alternatives

Hanson has not explored the merits of alternative Carboniferous Limestone quarry sites within the administrative area of Forest of Dean Council, or the wider Gloucestershire County Council (GCC), since this is an exercise currently being undertaken by GCC as part of the preparation of their Minerals Local Plan.

Most of the county’s crushed rock infrastructure and operational capacity is focused within the existing quarry sites of the Forest of Dean. In 2011, crushed rock reserves at the 2 active and 2 inactive (one of which is Drybrook Quarry) sites in the Forest of Dean were reported to have accounted for 62% (approximately 19.3 million tonnes) of the total GCC crushed rock landbank. However, the majority of these reserves are held by Drybrook Quarry and another two quarries in the Forest of Dean, Stowfield & Rogers Quarry operated by Lafarge Tarmac, and Clearwell & Stowe Hill Quarry operated by Breedon Aggregates.

Chapter 6.0 of the Planning Application Statement notes that the adopted Minerals Local Plan (MLP) 2003 includes an 11 hectare western extension to Drybrook Quarry as a preferred area for future mineral extraction. Any proposals for the extension of mineral extraction at Drybrook Quarry would require that all aggregate should be processed through the processing plant in the existing quarry.

In terms of alternatives to the permitted quarry development scheme, the current scheme has been designed to maximise the exploitation of the reserves from the current permitted area, and avoid any unnecessary sterilisation of the resource, which would not be in the interest of sustainability. In this context, any alternatives to the scheme as proposed would not fulfil this key objective.

It follows that Hanson considers that the scheme which is now proposed represents a logical means of continuing operations within the quarry, in a way which minimises environmental effects, whilst maximising the exploitation of permitted reserves, but without prejudicing the potential to extend the quarry at a future date into the MLP 2003 preferred area to the west. However, such an extension is a matter for the future, and it does not form part of the current application.
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Figure 3-1 Existing Quarry
Figure 3-2 Intermediate Quarry Development
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Figure 3-3 Final Quarry Layout
4.0 RESTORATION STRATEGY

4.1 Design Principles

This chapter sets out the aims and objectives of the restoration strategy for Drybrook Quarry. It draws upon the principles of the restoration and final landscape treatment shown on the approved outline Restoration Scheme which accompanied the 1992 planning permission. The restoration scheme has been updated to reflect minor changes to proposed final face/bench positions, changes to the tree/shrub planting scheme and also to incorporate additional grass seeding information. However, the general restoration principles and land use aims remain largely unchanged. It is also noteworthy that the restoration of the upper areas of the quarry has progressed with both planting and natural regeneration, and this provides a maturing context for the restoration of the remaining quarry area.

The general aims of the restoration strategy are as follows:

- Where possible, maintain a good vegetation screen around the edges of the site to minimise visual intrusion from viewpoints located in the surrounding landscape;
- Maintain previously planted peripheral woodland and internal plantations by thinning in accordance with the approved felling licence;
- Progressively restore worked areas of the quarry as soon as possible, to avoid undue delays and help integrate the quarry with the surrounding landscape;
- Where possible, recover existing and retain sufficient future ‘soil forming material’ consisting of poor quality top rock, clay interburden and quarry fines to provide a planting medium (up to 1.0m depth) for tree/shrub planting using suitable species. The creation of grassland on the placed ‘soil forming material’ using a low maintenance fescue based amenity mix on the quarry floor and first bench, with the addition of a calcareous wildflower mix to the amenity mix on benches two to four, to add biodiversity interest;
- The creation of random clumps of native trees and shrubs on the restored benches to provide vertical interest which will help break up and soften the linearity of the adjacent remnant faces from surrounding viewpoints, while still appearing relatively naturalistic, avoiding an unbroken block of woodland planting;
- Remove all remnant plant and related quarry infrastructure on cessation of extraction works;
- Undertake a successful 5 year period of aftercare across all restored parts of the quarry. This will help to integrate the restored quarry into the local landscape and minimise long term effects on landscape resources and visual amenity; and

On resumption of extraction operations, prepare a Biodiversity Action Plan (BAP) for the site which would incorporate the key restoration and aftercare details included within chapter 4.0 of the ES.

4.2 Restoration Aftercare Management

Due to the nature and timescales associated with the site, progressively restored areas of a suitable, manageable size will be entered into formal aftercare as soon as possible following restoration earthworks.

During the statutory 5 year aftercare period, the operator will maintain a record of all aftercare operations and will submit an annual aftercare report plus proposals for the forthcoming 12 months to the Local Planning Authority. Provision will be made for annual site meetings in late summer/early autumn between the operator, the Mineral Planning Authority and/or other statutory or non-statutory bodies, as agreed, to monitor the establishment and development of the various habitats.
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Figure 4-1 Restoration Strategy
5.0 SUMMARY OF ENVIRONMENTAL ISSUES

5.1 Introduction

The ES includes a detailed assessment of the effects of the quarry development and restoration scheme under a series of environmental and amenity topic headings. These are dealt with in detail in the ES and comprise:

- Chapter 6.0: Landscape and Visual Impact
- Chapter 7.0: Ecology
- Chapter 8.0: Hydrology and Hydrogeology
- Chapter 9.0: Noise
- Chapter 10.0: Blast Vibration
- Chapter 11.0: Air Quality
- Chapter 12.0: Transportation
- Chapter 13.0: Cultural Heritage

The exercise has identified a number of issues which require control and mitigation, many of which are already covered by existing planning conditions and related regulatory controls, and has highlighted up to date advice regarding standards and criteria.

As a summary of this exercise, the following key issues have emerged:

5.2 Landscape and Visual Effects

5.2.1 Landscape and Visual impact assessment

Due to its position on a south facing hillside, views of part of the existing quarry benches and faces are available from a number of elevated locations further to the south and to the east. However, views from the north are fully screened by both landform and intervening boundary vegetation. Similarly, views of the processing plant structures in the quarry bottom are very limited from all locations by landform and vegetation, although the entrance yard and offices/weighbridge area is visible from a small number of properties in close proximity and a footpath route. The large bund between the yard and quarry helps screen views from lower level locations to the east.

The landscape and visual impact assessment has considered effects on the landscape and on views from a range of vantage points in the general vicinity of the quarry. The conclusion reached is that the proposed development would give rise to only generally minor landscape and visual effects.

5.2.2 Landscape Mitigation measures

It has been assumed for the purposes of the assessment that the quarry would continue to be operated with high environmental standards which would include progressive restoration of worked land to minimise long term disturbance. The currently approved restoration scheme has been updated and the new scheme includes some additional, enhanced proposals including the spreading of ‘soil forming material’ (poor quality top rock, clay interburden and quarry fines) to form a seeding and planting substrate, the creation of low maintenance amenity grassland, more species rich calcareous grassland on selected benches, and tree/shrub planting in random clumps on benches visible from the surrounding area.

An important point to note is that the proposals to complete extraction at the quarry and restore it in accordance with the Updated Restoration Scheme would allow sufficient ‘soil forming material’ to be generated which would then be used to achieve the restoration work. In the long term this would benefit landscape character, visual amenity and nature conservation, and would avoid the need for soil importation.

For both landscape resources and visual amenity, it is considered that the proposed development would not have ‘significant’ adverse effects on any of the viewpoints assessed, both during the extraction operations to extract the remaining approved reserve or following restoration and a 5 year period of aftercare. The main reasons for this are that the quarry has been in existence for a number of decades and
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has become part of the character of the locality, and that it is inherently well screened by natural features and by on site screening bunds.

5.3 Ecology

5.3.1 Ecology Study

An Extended Phase 1 habitat survey was undertaken in January and February 2014.

The desk study and habitat based survey have provided a current ecological assessment of the application site, which includes the potential for legally protected, rare or notable species of flora and fauna to occur.

The areas where quarrying would take place comprise of un-vegetated bare rock and as such no habitat loss, fragmentation or isolation through land-take would occur.

No species-rich calcareous grassland was recorded and there are no ponds or other wetland habitats which have a nature conservation value.

No bat roosts or foraging/commuting habitats have been identified which could be affected by a continuation in quarrying activities. The parts of the site where mineral reserve remains are un-vegetated.

5.3.2 Ecological Effects and mitigation measures

No direct or indirect impacts upon statutory ecologically designated sites have been predicted. No further surveys and assessments were therefore deemed to be required. No formal habitat based mitigation is required as no ecologically important habitats would be lost.

No specific mitigation for bats is deemed to be required at the current time, as no roosts have been confirmed as being affected by the development and the continued working of Drybrook Quarry would not result in any significant impacts to foraging or commuting habitats.

A watching brief is proposed in respect of the presence of breeding peregrine falcon and sand martin although the development scheme is unlikely to affect either of these species.

The potential impacts to species are considered to be insignificant based on the results of current surveys and assessments. Update surveys are proposed for badger due to the potential for setts to establish in the future, however, this is unlikely to take place in the areas identified for active quarrying.

The ability to deliver biodiversity gains through site restoration are assessed as being positive at a local level. These include the creation of new areas of calcareous grassland and woodland/scrub habitats on the benches and the enhancement of perimeter plantations through thinning and where appropriate the creation of dead wood habitats.

The continued working of Drybrook Quarry will not result in the loss of any habitats of value in their own right or which could support protected species. The areas identified for future extraction comprise of bare rock and un-vegetated ground.

Overall, the continued working of Drybrook Quarry is not predicted to have any significant or long term adverse ecological effects.

5.4 Hydrology and Hydrogeology

5.4.1 Hydrology and Hydrogeology Study

The site is located just within the upper surface water catchment boundary of the Cinderford Brook, which drains southwards to join the River Severn near Blakeney.
The topographic divide for the River Wye catchment is located to the immediate north-west of the application site.

There are no permanent surface water drainage features within the immediate vicinity of the application site, and this reflects the highly permeable nature of the limestone bedrock which underlies the surrounding area.

A review of the Environment Agency website has confirmed that the application site and surrounding area has a ‘very low’ (less than 0.1% or 1 in 1000) chance of flooding from rivers. It is therefore considered that a Flood Risk Assessment is not required.

Historic groundwater level data between August 1988 and August 1989, for two groundwater monitoring boreholes installed to a level of c.171m AOD at the western and eastern ends of the quarry site, indicate that groundwater elevations are typically below 175m AOD, which accords with Hanson’s anecdotal observations during quarrying activities at the site.

Given the rapid infiltration rates associated with the high permeability and shallow depth below ground surface of the limestone aquifer, there is no requirement for a formal surface water management scheme around the quarry perimeter or in the base of the quarry.

The development will not have any significant direct effect on the surface water flows and flood risk from surface waters within the study area, either during future quarrying activities or during decommissioning, given that there will be no change to the lateral extent of the quarry footprint from current existing conditions; and the site infrastructure will not be significantly altered from the established layout at the quarry.

The development will not have any significant effect on the groundwater flow regime within the limestone aquifer, either during future quarrying activities or during decommissioning, given that no active dewatering or groundwater management will be required. Groundwater flow will continue to take place below the quarry floor via the underlying bedrock aquifer; and should groundwater levels rise above the quarry floor level due to unusually high rainfall recharge conditions, groundwater will be continue to flow across the floor of the quarry unhindered, both during the operational and restoration phases.

### 5.4.2 Hydrology / Hydrogeology Mitigation Measures

During the operational and decommissioning phases of the quarry and associated infrastructure, there is a risk of contaminated runoff being generated from the following potential sources and entering the underlying groundwater system within the limestone as a result of:

- accidental spillage of fuels, lubricants and other potentially contaminating liquids; and
- suspended solids within surface water runoff.

Given the current pollution prevention measures employed at the quarry, it is considered that the magnitude of impact on groundwater quality due to spillage of fuels, lubricants and other potentially contaminative liquids will be ‘negligible’. Given the above, the significance of potential direct effect to groundwater quality would be ‘negligible’. As there is no surface water receptors within the immediate vicinity of the site, the only pathway for surface water receptors to be significantly affected from contaminated runoff at the application site would be indirectly via the groundwater pathway.

However, as noted above, the significance of potential direct effect to groundwater quality would be ‘negligible’, and consequently there is no requirement for additional mitigation measures to protect surface water receptors.
5.5 Noise

5.5.1 Noise Study

A study of the noise effects of a continuation of quarrying and related operations at Drybrook quarry has been undertaken to assess the potential noise impact of the proposed extension to the time period for completing extraction and restoration of the quarry.

Attended baseline noise measurements were undertaken in January 2014 at six locations representative of the nearest noise sensitive properties to the site, in periods corresponding to the permitted operating hours of the site.

The existing noise climate was generally affected by distant road traffic, vehicles on local roads, distant large aircraft and birdsong. The lowest measured background noise level was 28 dB L_{A90, 15 minute, free field} at Hill Farm and Purlieu (Perlay) Cottage and the highest measured background noise level was 44 dB L_{A90, 15 minutes, free field} adjoining the site gates inside the quarry entrance.

The average background noise levels from the attended sample measurements in January 2014 for the six locations are between 34 and 40 dB L_{A90, T}.

The current planning permission imposes a noise limit where “the maximum L_{Aeq, one hour, noise level from normal quarrying operations shall not exceed 55 dB(A) at any dwelling or other noise sensitive premises during the permitted hours of operation of the quarry”. The main hours of operation are “7.00 am - 5.00 pm, Monday to Friday (inclusive).” This has been taken as an ‘Upper Noise Limit’ for the purpose of the assessment. An alternative ‘Lower Noise Limit’ has been taken as a maximum increase of 10 dB above the existing background noise level.

In order to assess the noise levels for the existing and proposed site operations, the contribution from each significant specific noise source has been evaluated separately and then combined together to give the overall site noise level at each of the selected receiver locations. The calculations have also assumed a mitigation measure for the noisiest activity, the intermittent use of a rock drill, which would be mitigated by being located at lower levels within the quarry, screened by an adjoining rock face.

At all six of the receiver locations, the calculated overall site noise level with the rock drill included is below the Upper Suggested Site Noise Limit of 55 dB(A). At five of the six receiver locations, the calculated site noise levels with the ‘built-in’ noise mitigation measure for the rock drill are below the Lower Suggested Site Noise Limit and at one property it is at the Lower Suggested Site Noise Limit.

5.5.2 Noise Mitigation Measures

From examination of drawings showing the existing site, the proposed limit of extraction and the final development, it is apparent that drilling on the upper benches has already been completed. In effect the mitigation measures are ‘built-in’ to the design since the rock drill will be constrained to lower benches, with significant barrier attenuation afforded by the previously worked quarry faces.

In the current planning permission, condition vi states “No drilling operations shall be carried out above ground level within Phases 1, 2 and 3 of the permitted operations, except between the hours of 8.30 am – 4.30 pm Monday to Friday (inclusive) and no drilling operations whatsoever shall be carried out on Saturdays, Sundays, bank or Public Holidays.”

This requirement for limited hours of operation when the rock drill is being used above ground level is included in the current permission along with a site noise limit at dwellings of 55 dB L_{Aeq, 1 hour, free field}. Since the calculated noise levels with the rock drill included comply with the Lower Suggested Site Noise Limit at all of the selected dwellings there is probably no need for the limited hours of operation for the rock drill to be brought forward into a new planning permission. However, Hanson
would be content for the limitations on the use of the rock drill to be brought forward into an updated planning permission.

The existing site contains appropriate noise attenuation measures which do not require improvement or expansion to facilitate the continuation of extraction of the permitted reserve, particularly given the fact that drilling on the upper benches has already been completed. The mitigation measures are ‘built-in’ to the design, with significant barrier attenuation afforded by the previously worked quarry faces.

Hanson would be content for the existing noise limits to be re-imposed on an updated planning permission. However, given the ability to comply with a Lower Site Noise Limit (so as not to exceed the average background noise level by more than 10 dB(A)), an opportunity is available to the MPA to impose the suggested more stringent Lower Site Noise Limit.

Monitoring noise emissions to ensure compliance with appropriate environmental standards would be expected as a future requirement.

5.6 Blast Vibration

5.6.1 Blast Vibration Study

At Drybrook Quarry the rock is extracted by a succession of controlled blasts from quarry faces which breaks up the rock allowing it to be excavated and transported to the crushing and screening plant for processing.

Each blast is individually designed with boreholes charged with explosives and detonated in a way which loosen and breaks up the rock, which can then be excavated from a rock pile.

Ground vibration arising from blasting is calculated in terms of ‘peak particle velocity’ (PPV), and is measured in millimetres per second (mms). Detailed research has determined that vibration levels well in excess of 50 mms are necessary to produce structural damage to residential type properties. For human perception, government advice is that levels should be set in the range of 6-12 mms. The current planning conditions at Drybrook Quarry impose a ground vibration limit of 6mms for 95% of blasts.

Vibration is also generated within the atmosphere where the term ‘air over pressure’ is used to encompass both its audible and sub audible frequency components. Again, experience and knowledge and blast type and design enables prediction of levels and an assessment of their significance. However, unlike with ground vibration, predictions of air overpressure can be made less certain by the fact that air over pressure levels may be significantly influenced by atmospheric conditions. Hence, the most effective method of control is its minimisation at source.

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

An assessment of the potential impact upon nearby receptors from vibration generated by continued blasting operations at Drybrook Quarry has been undertaken. The assessment included predicted blast-induced vibration levels made to nearby vibration-sensitive receptor locations. The predictions are based on measured peak particle velocities from previous blasts experienced at Morse Cottage and Rosevale between 4th January 2007 and 26th March 2008.

5.6.2 Blast Vibration Mitigation Measures

The current planning conditions at Drybrook Quarry impose a ground vibration limit of 6mms for 95% of blasts. This limit accords with up to date standards and guidance, and it would be appropriate for this limit to continue to be imposed in relation to future operations.

The assessment has shown that the criterion of 6.0mms⁻¹ppv at 95% confidence can be achieved by suitable blast design. Therefore,
vibration generated by blasting events is not considered to be a limiting factor in continued blasting at the development site.

In this context, it is an established principle that specific aspects of blast design such as the number of boreholes or the amount of explosives used should not be included in the blasting conditions. Blasting design criteria must always be the direct responsibility of the site operator as defined by the Quarries Regulations 1999. Thus, conditions should state the desired objectives rather than the methods by which the objectives are to be achieved. In this case therefore the key issue is to set a limit on ground vibration, which will then require Hanson to design blasts to ensure adherence to the limits.

It is also recommended that the existing vibration monitoring program is continued for the life of blasting operations to ensure that blast-induced vibration levels at Morse Cottage and Rosevale to the south of the quarry remain within the 6mms⁻¹ppv limit.

5.7 Air Quality

5.7.1 Air Quality Study

An air quality assessment has been completed to consider the potential impacts as a result of the proposed extension of time to operations at the quarry. It has considered the relevant legislation, baseline conditions, activities associated with the site including haulage, excavation activities, storage and processing of material and restoration of the site.

The potential impacts of the development have been assessed in terms of potential emissions of particulates (dust). Two assessments have been undertaken; the first to assess the fine dust fraction (referred to as PM₁₀) for which Air Quality Standards exist, and the second to assess the coarse fraction dust which is typically associated with amenity issues.

An assessment of PM₁₀ found that background PM₁₀ levels are ‘well below’ the Air Quality Standards (AQS) limit, and the risk that operations at the quarry will cause an exceedance of the AQS objective is considered to be low.

An assessment of deposited dust identified the potential sources of dust arising from the quarrying and related operations. Receptors were ranked in terms of the risk of dust impact which is dependent on the distance from the site boundary, the frequency of wind direction and rainfall patterns.

5.7.2 Air Quality Mitigation Measures

The existing planning permission for quarrying at Drybrook Quarry has the following conditions with regard to dust:

‘The operator shall provide, implement and maintain dust suppression measure as may be agreed by the Mineral Planning Authority to minimise the emission of dust from the development hereby authorised. Such measures shall include the water spraying of access and haul roads to suppress dust in periods of prolonged dry weather and when necessary the sheeting of lorries leaving the site’.  

It is anticipated that new and additional noise controls will be required via updated planning conditions, and new conditions have been suggested, as follows:

(i) The best practicable means shall be used to restrict the generation of dust within the quarry, and shall include provision for haul roads and access roads to be watered during dry weather to lay any surface dust.

(ii) At all times during the carrying out of operations, a water bowser or similar equipment shall be available on site, and be used to minimise the emission of dust from haul roads within the quarry.
(iii) Prior to the resumption of quarrying operations, a scheme shall be submitted for the approval of the Mineral Planning Authority setting out details of the location and type of wheel washing facility, and the approved scheme shall be implemented prior to a resumption of export of aggregate from the quarry.

(iv) Measures shall be taken to minimise dust emissions from quarrying operations, in accordance with the following protocol:

(a) Soils and overburden shall not be handled during extreme dry conditions unless the working areas are first dampered down;
(b) Drilling of shot holes shall be undertaken using drilling rigs fitted with a suitable dust collection system;
(c) Site roads within the quarry shall be dampered down as appropriate;
(d) The site entrance road shall be maintained by use of a road sweeper which shall operate as required to maintain the surface of the road free of mud and other detritus.
(e) All lorries, once loaded, shall be sheeted prior to leaving the site, with the exception of any load carrying plus 75mm size stone.
(f) The speed of haulage vehicles at the site will be restricted to 10mph.
(g) All site vehicles will be fitted with upswept exhausts and radiator fan shields.
(h) Lorries will be loaded so as to avoid spillages.
(i) All site traffic will be kept to the designated haul routes
(j) Any plant spillages will be cleared to avoid accumulations.
(k) Drop heights will be minimised at loading and discharge points.

Additionally the quarry is controlled by a Permit which includes a requirement to implement a series of dust control measures including:

- continuous emission monitoring from the processing plant;
- stockpiles within the quarry subject to dust suppression;
- loading of lorries in a way which minimises drop heights; and
- storage of fine aggregate and loading within a building.

On the resumption of operations at the quarry a new Permit will be issued, which will introduce stringent dust control measures, in addition to those set out in the suggested planning conditions..

5.8 Transportation

5.8.1 Traffic Study

The impact on the local highway network of the proposed 10 year extended time-frame for operations to be completed at Drybrook Quarry has been considered in the context of the extant planning permission, baseline traffic conditions and the implications of the proposed activities going forward, which effectively represents a continuation of activities currently approved for a further period of 10 years to April 2024.

The proposed hours of operation, method of transport and types of vehicle used would not materially change. However, the proposed annual output is predicted to be lower than has historically been accepted on the local road network. In addition the existing access to Hawthorns Road, which has been reviewed and was found to be acceptable, will continue be used to serve the site.

The safety performance of the site accesses and local highway network, which continues to accommodate daily HGV movements, has been reviewed, and records confirm that there have been no recorded accidents at the site access and no recorded accidents involving HGVs on the neighbouring highway network for the last 5 years, which is the standard period of assessment. As a result, highway safety is not considered to be a constraint to the proposed development.
The nominal rate of extraction of 250,000 tonnes would result in an average of 50 loads (100 HGV movements) per day passing through the site access. Based on identified and historic markets it is anticipated that 30 loads (60 movements) per day would travel along the route to the A40 to the north of the site and 20 loads (40 movements) per day would travel to the south via Hawthorns Road/Drybrook Road and Morse Road to the Plump Hill intersection with the A4136 and A4151 based on the previously identified 60 / 40 north south split.

When taking into account observed fluctuations, up to 90% of traffic was found to travel through Drybrook to the south. Based on this distribution, up to 90 vehicles per day would travel through the village.

The A40, A4136 and A4151 are identified on the Advisory Freight Route Map as “Routes for local journeys”. The routes identified above from Drybrook Quarry to the A class roads are the only routes available due to the location of the only vehicular access to the site.

The reserve or spare capacity on local routes was found to range between 522 and 939 vehicles per hour, which equates to between 30% and 75% of the theoretical flow that could be accommodated. In addition, it was found that the quantum of development traffic falls within existing hourly and daily variations on the network. As a result, highway capacity is not considered to be a constraint to the ongoing activities proposed at the site.

### 5.8.2 Traffic Mitigation Measures

Having considered the findings of the assessment undertaken, it is recommended that the operator’s approved traffic management protocols at Drybrook Quarry be maintained and reviewed in accordance with normal procedures during the proposed extended life of the development to ensure that the effects of HGV movements are maintained at an acceptable level.

The study has concluded that the proposed development would not result in a severe residual cumulative impact. Therefore, the development would not fail the test imposed by paragraph 32 of the National Planning Policy Framework which requires “safe and suitable access” to a development site, and in such circumstances the proposal should not be refused on transport grounds.

### 5.9 Cultural Heritage

#### 5.9.1 Cultural Heritage Study

A cultural heritage desk-based assessment was undertaken in connection with the current planning application.

As the application site comprises of entirely worked land associated with quarrying, no archaeological interest remains within the quarry footprint and archaeology was thus not considered in detail.

The assessment considered only indirect effects upon cultural heritage, which can occur as a result of significant changes to the setting of an historic landscape or feature, whether permanent or temporary. This is particularly relevant to designated features of national importance, such as Scheduled Monuments, Listed Buildings, Conservation Areas, and Historic Landscapes, Parks and Gardens of Special Historic Interest.

A search was made of the National Heritage List to identify Scheduled Monuments, Listed Buildings and Registered Parks and Gardens for a study area of up to 1.5km from the site’s boundary. This was considered an appropriate area of search, based upon the extent of existing and historic quarrying, topography and built development to allow consideration of any effects upon the setting of designated assets. The local Historic Environment Record was searched for a distance of 1km from the Site.

Three listed buildings lie within 1.5km of the Site. The closest is Beechwood, a Grade II listed house, 375m north of the Site. A
combination of topography and intervening vegetation would ensure that there is no visual connection between Beechwood and the Site. The other two designated cultural heritage assets are separated by a combination of distance (Drybrook Chapel - 800m; Ruardean Church – 1500m), intervening development and vegetation. The proposed deepening of the quarry would not change the current situation in respect of the setting of cultural heritage assets. The nearest scheduled monument is Ruardean Castle at a distance of 1650m.

5.9.2 Cultural Heritage Mitigation Measures

A combination of topography, intervening development and distance will prevent adverse effects of future quarrying upon the setting of cultural heritage assets.

It is considered that overall the effect upon cultural heritage would be neutral (i.e. no change to the existing situation). Consequently, no specific mitigation measures are deemed necessary.
6.0 CONCLUSIONS

This document comprises a Non Technical Summary of an Environmental Statement which describes the details of the proposed development and restoration strategy, and sets out the potential environmental effects which would be associated with the development.

It highlights the nature of the renewal application, which provides a quarry development and restoration scheme for the site, and the underlying principles of the application which do not seek to amend the currently planning permission in any way other than a time extension of 10 years. Reference is also made to the opportunities which are available to draw upon the established mitigation measures and controls which are in place at the existing quarry, and which can continue as part of the ongoing operation, with improvements to these measures where appropriate.

The ES describes the details of the phased quarry development scheme, which would be confined to the existing footprint of the quarry. It also describes the restoration strategy for the quarry, which updates and builds upon the principles of the currently approved restoration scheme.

The ES has been prepared in order to assist Gloucestershire County Council (GCC) and other interested parties to reach a decision on the merits of the development and the environmental and amenity effects which would be associated with it. It sets out the results of very careful, detailed and systematic research into each of the potential environmental effects of the development and, where relevant, sets out modern and well designed methods of mitigating the effects which, in the majority of cases draw upon existing, well established and effective controls at the existing quarry, with improvements to these measures where appropriate.

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 and local planning policy is to ensure that effects are minimised and maintained within acceptable limits rather than be eliminated. The general conclusion reached by the ES is that the proposed scheme would successfully minimise the environmental effects, and that the existing, and in some instances additional, mitigation measures are capable of being adopted in relation to ongoing operations at the site. The renewal application provides the opportunity for these measures to be regulated by planning conditions which can be applied consistently across the whole site. The key conclusion of the planning policy analysis in the accompanying Planning Application Statement is that the development could proceed in a way which “minimises” environmental effects, and where the effects from operations can be maintained within acceptable limits.

It is also considered to be a sustainable development, not least in ensuring that important permitted resources of high quality limestone within the quarry are not sterilised, which would be the consequence of not renewing the 1992 planning permission to facilitate the extraction of the permitted reserves.

In the light of the above considerations, it is concluded that the development could proceed in accordance with the underlying objectives of policies relating to the extraction of aggregate, and, in particular, within the context of the national policies which have been highlighted. The planning policy analysis also concludes that the development could proceed in accordance with the development plan policies for the area.

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