ROMP for Hindlow Quarry

Environmental Statement

Volume 1

May 2021

TARMAC
A CRH COMPANY

Heatons
Planning Environment Design

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Statement of Competence for the Preparation and Management of Planning Applications Subject to Environmental Impact Assessment

The Town and Country Planning (Environmental Impact Assessment) Regulations 2017, Part 5, 18 (5) In order to ensure the completeness and quality of the environmental statement—

(a) the developer must ensure that the environmental statement is prepared by competent experts; and

(b) the environmental statement must be accompanied by a statement from the developer outlining the relevant expertise or qualifications of such experts.

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Liam Toland BA(Hons) MSc MRTPI	Associate Director
Craig Ball DipURP MRTPI	Associate Director
Chris Lindley BA(Hons) MSc MRTPI	Associate Director
Jenna Conway BA(Hons) DipTP MA MRTPI	Associate Director
Selena Gaskarth BSc(Hons) MCIWM PIEMA	Associate Director
Clive Saul BEng(Hons) MSc MRTPI	Associate Director
Richard Duncan MA(Hons)	Landscape Architect
Joel Jessup BA(Hons) MSc MRTPI	Senior Planner
Sam Salt MPlan MRTPI	Senior Planner
Georgina Illsley BA(Hons) MA	Planner
Jack Chamberlain BA(Hons)	Graduate Planner
Natasha Liddiard BSc(Hons) Msc	Graduate Planner
Alexander Job MPlan	Graduate Planner

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1 Introduction and Background to Proposal

1.1 Purpose of this Report

1.1.1 This document is the Environmental Statement (ES), prepared on behalf of "Tarmac Cement and Lime Ltd" (The Applicant) who hereafter will be referred to as either Tarmac or the Applicant, which accompanies a first periodic review of the old mineral permission (ROMP) application and submission of modern planning conditions pertaining to planning permission (ref 1.776.R) for the winning and working of minerals and disposal of mineral waste at Hindlow Quarry. It has been prepared in support of an application for the 'Determination of New Planning Conditions' under the provisions of Section 96 of the Environment Act 1995.

1.1.2 The review is a requirement of the Environment Act 1995 that requires conditions regulating operations at active quarries to be reviewed at 15 year intervals. This ES includes appendices containing specialist technical reports as well as a draft schedule of planning conditions for consideration by the Mineral Planning Authority (MPA) which are suggested to control the ongoing mineral operations at Hindlow Quarry.

1.2 The Applicant

1.2.1 Tarmac is one of the UK's leading sustainable building materials companies. Its innovative products, solutions and services not only deliver infrastructure needed to grow the UK economy today but also enable a more sustainable built environment for the country's long term future.

1.2.2 Tarmac currently employs almost 7,000 people across the UK, and manages a wide range of sites across the country. Tarmac resources include 120 quarries, 74 asphalt plants, 100 ready-mix concrete plants, 22 contracting offices, 3 cement and 2 lime plants. The company also manage 330 strategically located sites across the UK.

1.2.3 Tarmac has contributed to some of the UK's biggest construction projects, including Wembley Stadium, Heathrow Terminal 5, The Shard, and the London 2012 Olympic and Paralympic Games. It also provides environmental stewardship for thousands of acres of the UK's countryside and has built up a wide ranging conservation portfolio based on award-winning restoration of quarry workings. Strong partnerships have been forged with wildlife trusts and other leading conservation bodies in the UK.

1.2.4 Safety is at the core of its operations, beginning with a commitment to provide a safe environment for employees and extending to contractors and communities around its sites. Since August 2015, Tarmac now form part of the CRH Group and engage in the manufacture and supply of a wide range of building materials across the world. For more information regarding the company visit www.tarmac.com.

1.3 Planning and Site History

Relevant Site Planning History

1.3.1 The site was established during the first half of the twentieth century with the single permission for the site being granted in March 1957 (reference CHA/1156/23) for the wining and working of minerals and disposal of mineral waste.

1.3.2 Derbyshire County Council, acting as the Mineral Planning Authority, required an Initial Review of the site's mineral planning permission under Schedule 13 of the Environment Act 1995. The Initial Review (code number 1.776.R) was approved on 28th April 1998 and a set of 50 planning conditions were issued with the Review (1998 Initial Review permission).

1.3.3 A Section 96A Non-Material Amendment to permission CHA/1156/23 was sought by Tarmac and was approved on 27 November 2014. The Non-Material Amendment introduced a new condition requiring the carrying out of an ecological survey of the Phase 1 working area prior to the resumption of quarrying in that area. The new condition stated:

'Prior to resumption of winning and working of minerals in Phase 1, the developer shall commission an ecological survey of the Phase 1 working area and submit a report of the survey to the Mineral Planning Authority. Where a new ecological interest is recorded, no extraction shall commence before the developer has submitted a scheme of ecological mitigation measures and that scheme has received the approval in writing of the Mineral Planning Authority. The mitigation measure shall be implemented as approved.'

1.3.4 Several of the 1998 planning conditions required further information to be submitted to, and approved by, the Council prior to any mineral extraction operations recommencing. In 2017, details were therefore submitted to DCC for approval in

order to facilitate the recommencement of mineral extraction operations. Information was submitted in relation to conditions 8 (scheme of extraction), 11 (scheme detailing the methodology and sequence for removal or recycling of material from Siberia Tip), 27 (noise protocol scheme), 32 (protocol to minimise air over pressure from blasting), 33 (blasting protocol scheme) The information submitted in respect of these conditions was approved by DCC on 20 July 2017.

1.3.5 Following the Initial Review, the first Periodic Review date for permission CHA/1156/23 was due to take place within 15 years of the Initial Review (i.e. by 28 April 2013).

1.3.6 However, the company requested a postponement of the first review date referring to the new provisions for greater flexibility in the scheduling of reviews of mineral permissions set out in the Growth and Infrastructure Act 2013. If current conditions remain satisfactory, it would appear appropriate to seek a longer postponement of the first review next Periodic Review for Hindlow Quarry. The MPA therefore agreed a deferral up to 28 April 2020.

1.3.7 On the 20th January 2020 a request was sent to the MPA seeking the further postponement of the submission of the first periodic review until 28th April 2021. This request was granted by letter dated 19th February 2020. A further request was made on 3rd March 2021 to extend the deadline until 30th June 2021.

1.3.8 Recent planning history for the site includes Notification for Prior Approval (Application Code NO. PD 17/1/70) relating to the development of a new extended rail siding at Hindlow Quarry, Buxton. The development was approved under delegated powers by the MPA under the provisions of Part 17 (Class B) of the Town and Country Planning (GPD) Order 2015 on 8th August 2019.

2 Site Location and overview of the quarry

2.1.1 Hindlow Quarry is one of four large limestone quarries (the others being Hillhead, Brierlow, and Dowlow Quarries) which lie close to the A515 Buxton to Ashbourne Road (see Location Plan Figure A) located within the administrative boundary of Derbyshire County Council. The site is situated between Brierlow Quarry to the north-west and Dowlow Quarry to the south-east and abuts both. The north-eastern boundary of the ROMP Application area is the A515 and the south-western, a green lane which runs to the rear of the three quarries.

2.1.2 The site area is 131 hectares and is bisected in two parts by a railway line which serves the quarry. The extraction area lies to the west of the railway line and includes a processing plant, lime manufacturing equipment for the production of lime and a rail siding. The area to the east of the railway line is currently a mix of pastureland, coniferous woodland and playing field all of which will eventually form part of the quarry's approved tipping area.

2.1.3 The two closest settlements to Hindlow Quarry are Sterndale Moor on the east side of the A515 opposite the quarry entrance and Earl Sterndale to the south west of the quarry. Earl Sterndale lies in the Peak District National Park and is approximately 475m away from the quarry boundary. There are a number of isolated properties north of Earl Sterndale which are located slightly closer to the quarry.

2.1.4 The access into the existing quarry is via its own dedicated access road taking vehicles from the A515. The quarry is also directly served by a rail connection which has been, until very recently, used to import limestone from Tunstead Quarry to continue the lime manufacturing process at Hindlow Quarry.

2.1.5 The Public Rights of Way drawing (Figure J) shows the location of rights of way within and around the quarry.

2.1.6 Footpath HP14/4/1 runs along a green lane which forms the western boundary of the quarry.

2.1.7 Footpath HP 14/8/1 travels north east from Footpath HP14/4/1 along the boundary with Brierlow Quarry until it meets the railway line and travels south east along the

railway line until it crosses the line using an accommodation bridge. This footpath then splits into two. Firstly, Footpath HP 14/8/2 which travels in a northerly direction until it meets the A515 and secondly Footpath HP 14/7/1 which travels south along the railway line and them north easterly towards the A515. This footpath connects with Footpath HP 14/5/1 on the opposite side of the A515 passing through Sterndale Moor.

2.1.8 Footpath HP 14/134/1 travels alongside the railway line which serves Dowlow Quarry and then travels in a northerly direction up to the A515.

Overview of quarry

2.1.9 Extraction of limestone at Hindlow started towards the end of the 19th Century for the purpose of lime manufacturing from kilns on the site. The quarry began to develop through the first half of the twentieth century, along with other neighbouring quarries, which recognised the quality and benefits of utilising the limestone geology present in the ridge stretching north to south, to the south west of Buxton.

2.1.10 The Cromford and High Peak Railway was constructed during the early part of the 19th century as a means of transport in this south Buxton area. This railway was realigned and improved to assist in distribution of products from the quarries and lime manufacturing plants that were developing to the south of Buxton.

2.1.11 In the late 1980s it was decided to halt quarrying at Hindlow but continue with the established lime manufacturing on the site. The limestone raw materials were imported by rail from Tunstead. All lime products have previously and will continue to be transported off site by road going vehicles.

2.1.12 More recently extraction has restarted at Hindlow Quarry, both to supply the on site modern lime manufacturing facility and to meet anticipated demand for construction materials. So at the moment the import of limestone has ceased and the established rail network is now being used to distribute construction aggregates. Lime products will continue to be distributed by road.

2.1.13 It is planned to continue the extraction of the limestone in a phased manner to exhaust the currently permitted reserves of limestone. It is also intended to rework some of the existing mounds of previously quarried material that are present within the quarry footprint. These were created as a result of quarrying the limestone and are surplus materials including overburden and scalpings from the crushing and

screening that occurred historically on site. Some of these materials will now meet specifications for construction aggregates.

2.1.14 As quarrying continues it is inevitable that there will be further surplus materials from the processing activities. These materials will have to be stored in a manner that will not prevent the future extraction of all the permitted reserves and also be available as a restoration medium that will be used to restore and improve the landscape of the quarry during the phased extraction and following cessation of extraction. As part of the continuing development of the quarry it will be necessary to permanently place some of these surplus materials on the fields between the railway and the A515 to create a landscaped landform. This is referred to as the North East landform and is in an area that the planning permission for the site designates for future placement of such surplus materials.

2.1.15 Full details of the quarrying activities, surplus materials placement and restoration are provided in this document.

2.1.16 The strategic importance of Hindlow Quarry relates to the range of lime products produced by the modern lime production facility which is now supplied directly from raw materials extracted at the quarry. The uses of these products are described below.

2.1.17 Lime is a basic dosing chemical for the majority of water treatment plants in the developing world. The Buxton range of quicklime products is designed for treatment of dewatered and digested biosolid sludges. Sewage and biosolids are frequently recycled to farmland following treatment by lime.

2.1.18 In many parts of the UK large areas of land are unsuitable for construction because the land is too wet or too weak to provide a stable base. Wet conditions and weak clay soils are stabilised by rotating specially formulated quicklime into the soil. These processes enable contractors to maximise the use of all site materials and obtain the properties that they need without removing unsuitable material from site and importing aggregates reducing overall cost and waste as well as transport movements and carbon emissions. The applicants soil stabilisation products have been proven on major projects such as the Channel Tunnel Rail link, Terminal 5 at Heathrow Airport and numerous retail and industrial parks throughout the UK.

2.1.19 Lime solutions play an important role in generating energy from household, municipal and clinical waste by ensuring that the gases that are released into the atmosphere are free from pollutants that can damage the environment. Injecting flue gases with lime is a highly effective way of neutralising harmful acidic substances. The process is similar to flue gas desulphurisation in coal fired power stations.

2.1.20 Lime is also used in the production of essential materials ranging from construction projects to iron, steel, plastic , glass, pharmaceuticals, animal feed and toothpaste.

2.1.21 As well as the above industrial limestone products the quarry produces construction aggregates used as base material for roads, railways, construction of buildings and drainage works.

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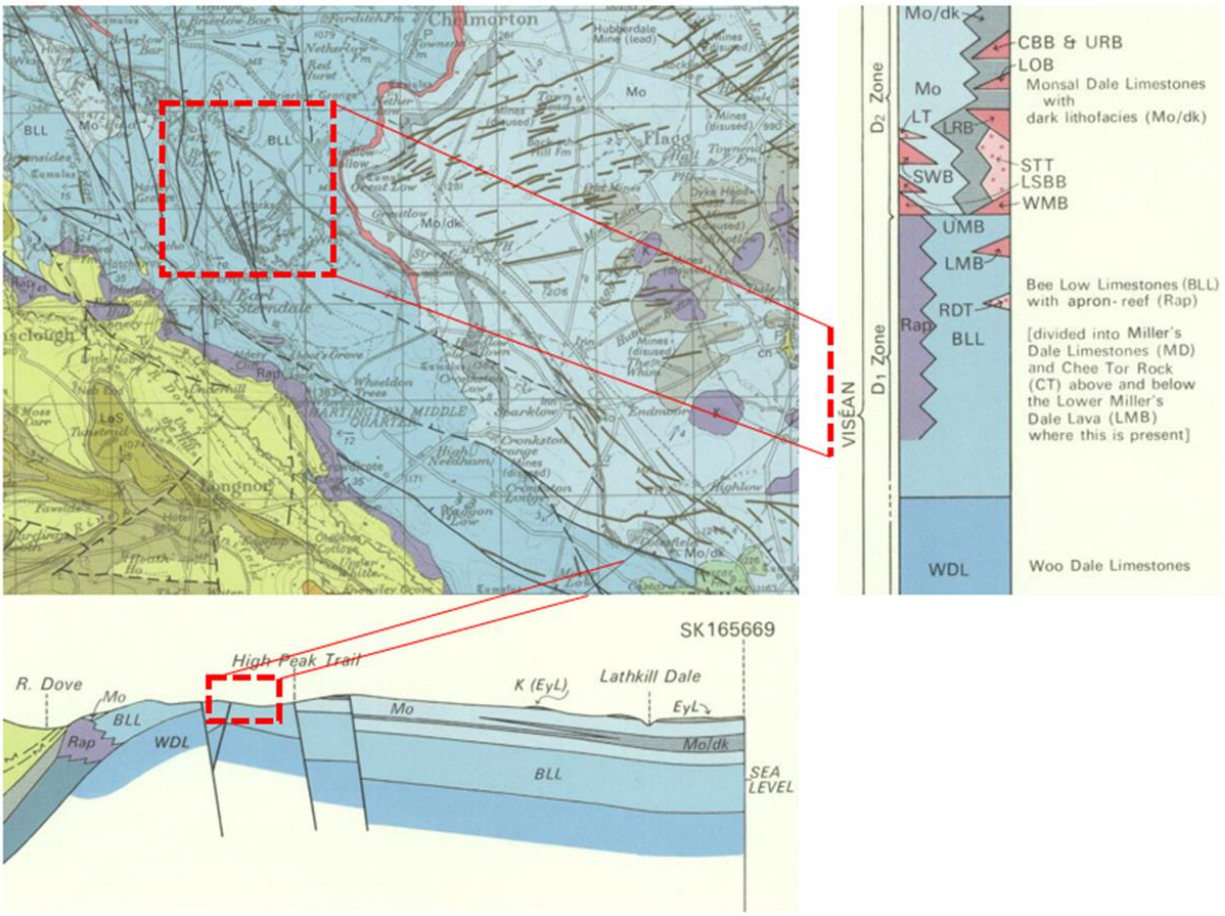
3 Geology

3.1 Introduction

3.2 Regional Geological Setting

3.2.1 The general solid and drift geology of the region is illustrated on published geological mapping: British Geological Survey 1:50,000 Series, England and Wales Sheet 111, Buxton. An extract from the published geological mapping is contained in Figure 3.1.

Figure 3.1 Regional geology obtained from the 1:50,000 scale solid geological map for Buxton Sheet 111 (BGS, 1978)



3.2.2 Much of the central and eastern part of the Peak District is characterised by outcrop of carbonates dating to the Dinantian series of the lower Carboniferous period. Faulting, mineralised veins, clay layers, lavas and karstic features are also common in the region.

3.3 Local Drift Geology

3.3.1 Superficial geology comprises of Holocene series (Quaternary period) glacial head and clay of variable depth. This is generally described as poorly sorted and poorly stratified, with angular rock debris and lenses of silt and clay. This has been observed to be 0.5 – 2.1m thick in the lands adjacent to Hindlow quarry.

3.4 Local Solid Geology

3.4.1 The solid geology of the area is described as belonging to the Viséan age of the Dinantian series. The local geology is comprised of a succession of interbedded limestone and dolomite formations.

3.4.2 The limestone encountered in the quarry and its surrounding area are comprised exclusively of the Bee Low limestone formation, belonging to the D1 zone of the Viséan age.

3.4.3 The Bee Low limestones are characterised as mainly pale grey, massive, chert free limestone beds up to 10m thick. Disbursed throughout are greenish grey – reddish brown clay beds up to 0.5m thick, which are likely derived from widespread falls of volcanic ash which have been weathered. The Bee Low formation is thought to be between 68 and 213m thick in the region, with a thickness of 161.94m having been measured in the BGS Eyam Borehole.

3.4.4 Underlying the Bee Low limestones is the Woo Dale limestone formation. At its top, this also belongs to the D1 zone of the Viséan age. It is not anticipated that extraction at Hindlow will reach this boundary. The general stratigraphy is shown in table 3.1.

Table 3.1 – Geological Summary

Unit (BGS Lexicon)	Description	Thickness
Glacial Head (HEAD)	Overburden. Head and clay. Poorly sorted and of variable depth.	0.5 - 2m approx.
Bee Low Limestone (BLL)	Light grey, very thickly bedded, micritic, extremely hard limestone with clay partings.	68 - 213m approx.
Woo Dale Limestone (WDL)	Medium to pale grey, thinly bedded, fine grained limestones and dolomites with clay partings. Note: These will not be encountered by quarrying at Hindlow.	402 - 1325m approx.

3.4.5 The Bee Low limestone encountered within the quarry is typically light grey, very thickly bedded, micritic, extremely hard and fresh to slightly weathered. Stylolites are rare throughout. Rare calcite crystals <4mm and very rare pyrite crystals <1mm are also found throughout. Where weathered, there is light brown to orange brown staining.

3.4.6 Clay beds encountered in the quarry are typically brown to yellowish brown, thinly – very thinly laminated, silty, very soft and rarely contain yellowish grey inclusions of limestone <14mm across. These have been seen to range 6mm – 35mm thick in site investigation boreholes and are rare in occurrence, although the clay encountered in the quarry may be thicker.

3.5 Structure

3.5.1 Viewed regionally, the area sits at the crest of a feature known as the 'Derbyshire Dome', which is a broad uplift that produced the carbonate outcrop of the central and eastern Peak District. In the Dinantian limestones of the area, this manifests as three gentle anticlines with flanking dips generally less than 10°, as well as in regional faulting.

3.5.2 Hindlow quarry sits close to the crest line of a feature known as the Brierlow anticline. The strata in the quarry typically dips 3° - 11° towards the northeast. Dip can be

adverse in localised areas where it is locally influenced by a series of faults or shear zones. These generally run though the quarry in a north to south direction and have a limited downward displacement to the east.

3.5.3 Bedding is typically very thick, very well formed and planar.

3.5.4 Two primary joint sets have been identified in previous site investigations. Their average orientations are:

Primary - J1: 83/009° (dip/azimuth).

Primary - J2: 90/091° (dip/azimuth).

3.6 Site Investigation

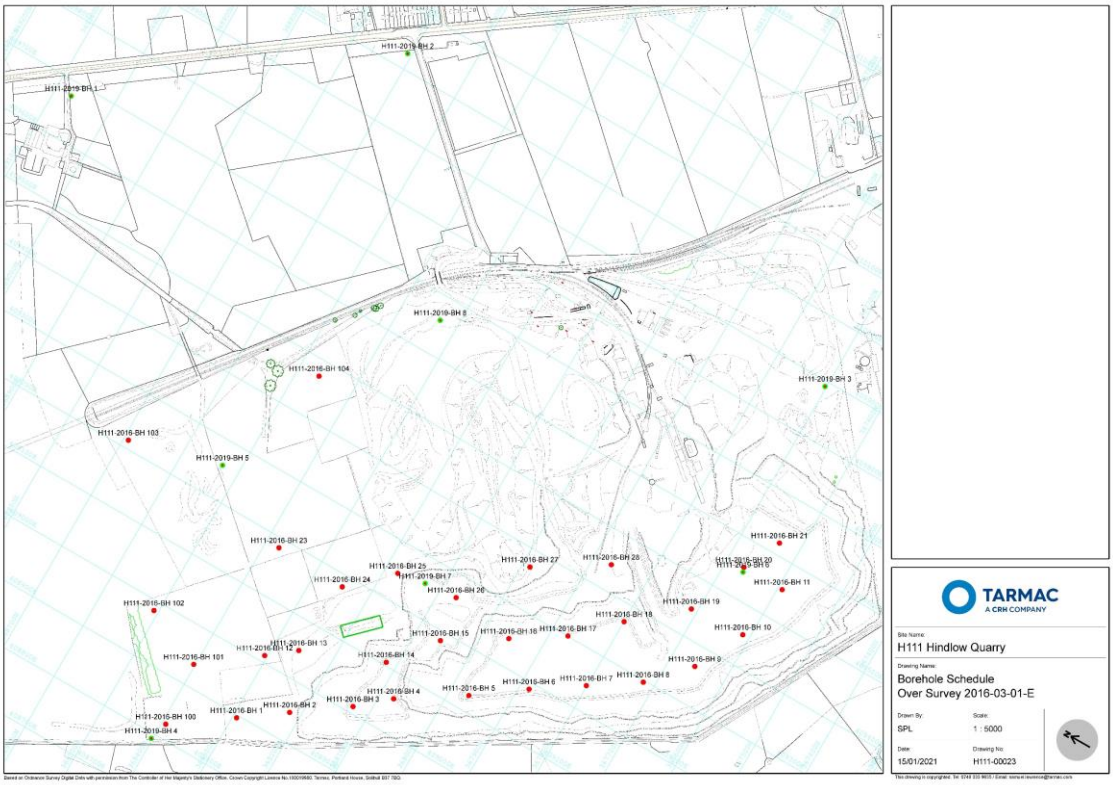
3.6.1 Tarmac has undertaken two major campaigns of site investigation at Hindlow in order to prove the presence, quality and quantity of remaining limestone reserves and resources. In 2016 and 2019, 40 boreholes were drilled (32 and 8 respectively) in order to recover samples for chemical analysis.

3.6.2 In addition, in 2017 a minor campaign of 68 very shallow (3m) boreholes were drilled with a very close spacing to recover samples for chemical analysis. This was with the aim to investigate the lateral chemical influence of faulting. Except where specifically referenced, the 2017 boreholes are not included within the assessment of quality in this report; as they target specific structural and chemical anomalies and to do so would skew the dataset.

3.6.3 All boreholes were drilled vertically.

3.6.4 All borehole locations are shown on Figure 3.2 below. A borehole summary is listed in table 1.2 in ES Volume 2 Technical Appendix J Geology.

Figure 3.2 – Borehole location plan showing locations of holes drilled in 2016 and 2019



3.6.5 The boreholes were drilled utilising three methods: Two from the 2019 campaign were drilled as conventional core, with the remaining 6 boreholes from 2019 drilled using reverse circulation. The remaining 100 holes from 2016 & 2017 were drilled as open holes. The methods were chosen in order to produce quality samples for chemical analysis whilst allowing geological and structural information to also be obtained in the case of cores.

3.6.6 Downhole geophysical surveys were also carried out in order to provide optical and natural gamma radiation data to facilitate geological, structural and hydrogeological interpretation.

3.6.7 Water monitoring installations were also placed in four of the 2019 boreholes close to the site boundary.

3.6.8 The 2019 boreholes were drilled to the base of the previously consented extraction. The 2016 boreholes were drilled to a depth of 30m, with four being drilled to a depth of 39m. The base of the Bee Low limestone was not encountered in any of the site investigation.

3.6.9 Chemical analysis was performed on samples collected in all site investigation campaigns and the mineral quality is set out in ES Volume 2 Technical Appendix J.

3.7 Mineral Reserves and Quarry waste

3.7.1 In-situ mineral volumes have been calculated for each phase of mineral extraction to the complete final quarry design and reported separately. The figures are calculated from volume between existing topographic survey, and base of mineral extraction using all available borehole data (see Figure L Technical sections).

3.7.2 Mineral waste, as previously discussed, will comprise natural materials won from excavation of Limestone on site. It will primarily be fine material scalped (sieved) from the larger limestone blocks during processing, and will also contain much limestone material. Occasionally, where geological faults are present which may contain a chemistry unsuitable for Lime production or for aggregates, small quantities of blasted rock may be placed directly to the north east landform.

3.7.3 Historically, the waste factor is calculated to have been c.15% at Hindlow, based on estimates of waste material on site, and total mineral extraction to date. For future extraction a figure of 10% waste is estimated as a basis for landform design and mineral recovery tonnages.

Lime Kiln production

3.7.4 Lime production at Hindlow works has been taking place since the late 1800s. Limestone blasted from the faces is processed to create lumpstone of a specific coarse size, suitable for use in the Maerz kilns on site. The removal of finer material – as well as being necessary to allow the lime burning process to take place, also improves quality. Lime requires both a high CaCO3 content of the rock, and a low content of all other materials (such as silica, sulphur and metals). These other materials typically are concentrated in the finer materials that are scalped out.

3.7.5 At Hindlow, kilnstone of either 120-90mm or 90-40mm is used by the kilns. Anything finer than 40mm is removed. Depending on required throughput, between 60 and 70% of material produced will be suitable for Kilnstone depending on how it is processed. The range of kilnstone sizes being produced allows the maximum yield of chemical grade stone to be gained.

3.7.6 The chemistry of the Limestone varies throughout the quarry. Site investigation gives some indication of the variation, and production drilling will be tested on an ongoing basis. This allows assessment of each blast for suitability. Different lime products require different qualities of Kilnstone. It will be necessary to blend from different faces at times to ensure quality control is met. To achieve this, quarry development is flexible enough to show multiple faces available to be worked at any one time, however the exact location of faces at the end of each face cannot be guaranteed, and should therefore be taken as indicative only at this stage.

Aggregate Production

3.7.7 Material produced as aggregates will primarily comprise lower quality fill materials created from scalped -40mm material during the processing for Kilnstone. It may be possible to produce some quantities of single size 'premium' aggregates also from this material.

3.7.8 In addition, at times through quarry development, there will be a need to concentrate primarily on aggregate production where Limestone quality is entirely unsuitable for Lime feed. This will be notable in upper faces of quarry development, and areas of Geological faulting which contains impurities.

3.7.9 Depending on market demand, there may be surplus of the lower grade aggregates (particularly those with higher clay content), requiring this material to be placed to restoration both inside and outside of the excavation area as shown in the quarry development phasing and described below. This is estimated at 10% of in-situ material.

Quarry Waste Management

3.7.10 As noted above, waste is anticipated as a by-product of creating lime and aggregate products. Waste is anticipated to comprise Soils and Overburden (which will be exclusively placed to the NE landform), rock processing waste materials (raw Limestone and Limestone/clay scalpings, which will go to the NE landform, and to eventually backfill of the quarry excavation), and historic waste material re-handled to allow quarry development (also to be placed to the NE landform).

3.7.11 Based upon the phased extraction as shown, the mineral extraction, overburden stripping and materials placement is anticipated to be as shown in Table 3.2 below.

Table 3.2 – Waste Material Movement by Phase

Hindlow - Waste Materials Movement by Phase

Phase	Approx End Date	Overburden to Strip (m^3)	Existing Historic Tips to Move (m^3)	Overburden and Historic Tips to Store in Quarry (m^3)	Overburden and Waste to NE Landform (m^3)	Mineral Extraction (mt)	New Processing Waste Generated (m^3)	Processing Waste to Store in Quarry (m^3)	Processing Waste to NE Landform (m^3)	Capacity Needed in NE Landform (m^3)
1	2028	122,000	302,000		424,000	16,000,000	704,000	500,000	204,000	628,000
2	2035	71,000	-		71,000	14,000,000	616,000	-	616,000	687,000
3	2042	-	355,000		355,000	14,000,000	616,000	-	616,000	971,000
4	2072	-	622,000	622,000	-	60,000,000	2,640,000	2,128,000	512,000	512,000
5 (FQD)	2108	-	254,000	254,000	-	78,000,000	3,432,000	3,432,000	-	-
Total		***193,000***	***1,533,000***	***876,000***	***850,000***	***182,000,000***	***8,008,000***	***6,060,000***	***1,948,000***	***2,798,000***

4 Development Proposals

4.1 Introduction

4.1.1 This ES aims to outline the current and future working practices at Hindlow Quarry. The current Periodic Review is required by the Environment Act 1995 which places the requirement on the mineral owner/operator to submit to the Mineral Planning Authority (MPA) for approval, a scheme of conditions to demonstrate how the development of the 'mining site' (i.e. Hindlow Quarry) can be carried out in an environmentally acceptable manner. The overarching aim of the ROMP application is to ensure that new conditions are consistent with modern environmental standards and working practices.

4.1.2 Historically, Hindlow Quarry has been worked for limestone to feed the kilns on site for the manufacture of lime products. Any out of specification material, unsuitable for lime manufacture, was stockpiled on site creating large scalping stockpiles. Following the mothballing of the quarry in 1988, limestone was imported by rail from the nearby Tunstead Quarry to continue the lime manufacturing at Hindlow. Any material unsuitable for lime manufacture was added to the scalping stockpiles. Periodically, since 1988 these stockpiles have been worked for their qualities as construction aggregate and have been sold and distributed from site for this purpose.

4.1.3 More recently, following increased demand for construction aggregates from construction projects such as HS2, winning and working of limestone at Hindlow has resumed with the intention to supply indigenous limestone as a feed to the on site lime manufacturing facilities as well as the construction aggregate demand. To do this it is proposing to ramp up production to around 2 million tonnes per annum going forward. A large proportion of these aggregate products will be transported from the site by rail to construction contracts. It is proposed to continue the manufacture of lime products and increase the working of the existing stockpiles of scalpings for aggregates.

4.1.4 At present, the geological appraisal undertaken at Hindlow has indicated approximately 182 Million tonnes of permitted reserves of limestone remaining unworked at Hindlow Quarry. At the predicted rate of 2 million tonnes per annum this will take extraction operations well beyond the current 2042 planning expiry date for completion of extraction, up to 2108. The 2042 date is somewhat arbitrary and was

imposed following the Environment Act 1995 to impose a maximum 60 year life from 1982 on 'old' mineral planning permissions. Acknowledging that outputs will vary and may exceed the 2mt used for the assessment, and that demand for industrial and aggregate grade limestone will exist beyond 2042, the Environmental Impact Assessment has been undertaken based upon the progressive development of the Quarry to 2042 but the full extraction design and subsequent restoration has been included, to illustrate that the full reserve can be worked in an acceptable manner.

4.1.5 A series of 5 working phases has been devised which sets out the full extraction of the permitted reserves:

- Figure C - Phase 1 – up to 2028;
- Figure D - Phase 2 – up to 2035;
- Figure E - Phase 3 – up to 2042;
- Figure G - Phase 4 – up to 2072; and
- Figure H - Phase 5 – up to 2108

4.1.6 This Environmental Statement and ROMP application will consider Phases 1 to 3 up to the year 2042.

4.1.7 Technical reports have been undertaken to consider the future environmental impact of the permitted mineral operations at Hindlow Quarry. The technical reports are appended to this ES in Volume 2.

4.1.8 In the context of the ROMP application, the primary purpose of this ES is to assist in identifying environmental effects, and to use that information to:

- Devise measures to minimise the environmental effects through an updated design of the quarry development scheme and/or specific mitigation/attenuation measures; and
- Provide for the measures to be implemented via use of updated planning conditions which regulate ongoing mineral operations in a way which is reflective of the conclusions and recommendations of the technical assessments and overall conclusions of the ES.

4.1.9 For the purposes of this ROMP application it is estimated that production will be ramped up to around 2 million tonnes per annum up to and beyond 2042. This figure could fluctuate subject to the demand for aggregate, lime production and market

conditions. The availability of a rail facility for the transportation of aggregate enables the change in output to be delivered quickly and the environmental effects minimised.

4.1.10 It is proposed that that all processing and crushing of aggregate will take place within the quarry using mobile plant. Mineral haulage from the mobile crushing plant will take place in clockwise and anti-clockwise systems which will be established to minimise haulage. The anti-clockwise system will be removed after 2042 and lower-level access will be solely from the clockwise ramp.

4.1.11 The applicant proposes no amendments to the existing site access.

4.1.12 This ES has considered the proposed outline working scheme for the site based upon revised phasing plans (Figures C, D, E, G and H).

4.2 Proposed Phased Working & Restoration Scheme

Current Situation (refer to Figure B)

4.2.1 With an anticipated increase in demand for construction aggregates and a readily useable rail connection, the company have re-commenced mineral extraction at Hindlow Quarry. This will produce aggregates to meet this demand and which will also be used for the manufacture of lime products. Furthermore, there will also be an increase in the working of the existing stockpiles of scalpings for aggregates..

4.2.2 Mineral extraction is currently concentrated within the western area of the site in a series of faces and benches down to the 370m AOD. There are a series of previous overburden / waste material stockpiles located within the mid and south eastern area of the quarry, emanating from quarry and kiln operations. The location of these stockpiles are shown in Figure J.

4.2.3 Blasting has commenced at the quarry to remove rock from the face. Mobile plant is currently being used in the western area of the quarry for the crushing and processing of aggregate which involves the creation of temporary stockpiles adjacent to the plant. This product is then transferred for onward sale via either HGV or rail.

4.2.4 The access into the quarry is via its own dedicated access road which connects up with the A515. This access road has an accommodation bridge across the railway. Also, the quarry is already directly served by a rail connection which was previously used to import limestone from Tunstead Quarry, for lime manufacturing, utilising the on-site kilns at Hindlow. This is in the form of a rail siding into the quarry. A parallel siding has

just been constructed over the last couple of months. This will allow up to 22 rail deliveries per week from site. Trains with a payload of up to 1650 tonnes can now be used.

4.2.5 The mineral for lime production is now being supplied directly from Hindlow. The limestone geological composition at Hindlow is suitable for use in the lime manufacturing process and therefore a reduction of imports from Tunstead is likely as Hindlow ramps up production.

4.2.6 Permission has recently been granted to create another siding in a different alignment to the existing sidings. Construction of this siding in the future would allow the quarry development to proceed as anticipated by the current scheme, to maintain rail freight from the site.

4.2.7 Approximately 20% of the currently permitted extraction area remains under either agricultural/woodland use awaiting stripping prior to extraction.

Phase 1 Working up to 2028 (refer to Figure C)

4.2.8 The existing quarry access road onto the A515 will continue to be used for the duration of operations.

4.2.9 The initial development works will commence during this phase. These works will minimise the need to strip/remove the existing waste tips such as the south eastern tip which provides screening of operations at this stage.

4.2.10 Fields to the NW and NE of the site will be stripped within this phase to expose the rock. Some 65,000m³ of soils and overburden will be stripped within this phase and shall be placed as a bund to the south of the existing rail line, north of the extraction area. It will be necessary that some soils will be placed in a soil storage bund located immediately north of the rail line. At this stage some temporary soil storage within the phase 1 boundary may be required. The soil stripping process will take place annually in order to keep as much of the land in agricultural use as possible.

4.2.11 Public Rights of Way within the site will require diversions and closures. To the south of the rail line PROW HP14/8/1 will require a minor diversion during the stripping phase. The diversion will be through existing woodland between Brierlow and Hindlow quarries. To the north of the rail line both PROW HP14/7/1 and HP14/8/2 will be closed and a diverted route which runs adjacent to the eastern and western boundaries of the quarries will replace them.

4.2.12 Initial mineral extraction within this phase will be by method of drill and blast on the legacy north western faces. The existing bench levels will be advanced to the NW and NE to begin, splitting the high legacy face at 400m AOD. This is followed by advancing of the 385m AOD and 370m AOD levels. Later in the phase, the quarry floor will be deepened to 355m AOD.

4.2.13 There will be temporary ramps established to the working levels adjacent to the rail sidings. In order to create the ramps, partial removal of historic waste tips is required. Material recovered which is suitable shall be sold on the aggregate market, unsuitable material will be placed for the creation of NE landform in order to further screen the mineral operations. Unsuitable material in this instance is defined as overburden and unsuitable limestone quality.

4.2.14 The processing of material will take place on the working benches and material shall be stored on the benches, or hauled to the quarry floor or to the existing stockpiling areas. Processing of new mineral for kilnstone will generate some waste (clays and Limestone, all natural materials won from the site). Where these materials cannot be sold to the aggregates market, the surplus will be placed to storage. During Phase 1, the majority of this surplus will be retained within the current excavation. Some materials will be placed to the new NE landform.

4.2.15 Surplus overburden and generated quarry waste will be used to establish the permitted north eastern landform. This will include stripping of in-situ soils and storing them within the northern area of the site temporarily. In the stripped area the overburden and waste shall be placed to restoration levels, onto which a second strip of soils will be placed onthe landform footprint to progressively complete the new landform. The southern and eastern areas of the landform are to be further planted to strengthen screening ability.

4.2.16 Ending phase 1 will be the creation of a new stockpiling area and associated infrastructure north of the rail line. Soils stripped here shall be placed immediately into the site internal screening bunds. These willbe seeded and maintained. The soils and overburden within the stockpiling area total 60,000m^3. Stock stored here will be aggregate products for sales from the quarry that will leave via HGV.

4.2.17 All land within the site will be managed and maintained.

4.2.18 Mineral extraction in this phase is expected to release up to 16,000,000 tonnes.

Phase 2 Working up to 2035 (Refer to Figure D)

4.2.19 Stripping of overburden continues to move NE of the current extraction on an annual basis. By the end of Phase 2, the full extent of extraction area will be exposed by stripping of soils. The soils are to be placed directly into the soil storage bund located directly north of the rail line, or used for immediate restoration works within the quarry footprint. As with Phase 1, some temporary soil storage may need to take place within the phase boundary

4.2.20 The existing rail line/sidings will continue to remain operational for the importation (if necessary) and exportation of final product. The development of the new rail siding to the south east will be commenced during this phase and enhancement works will take place to the existing rail sidings to improve efficiency. The new rail sidings will eventually replace the existing rail sidings to allow for ongoing mineral extraction.

4.2.21 Mineral extraction will advance, by method of drill and blast, on the 380m AOD, 370m AOD and 355m AOD levels. The extraction on the 400m AOD will have been completed. The base of mineral extraction will progress down to 340m AOD in the central north area.

4.2.22 The quarry shall be developed in a north / NE direction with new ramps established between working levels. Vehicles leaving the quarry floor will access the higher levels in a clockwise direction along the north eastern extraction boundary providing access to the stocking areas.

4.2.23 The processing of material will take place on the working benches and material shall be stored on the benches, or hauled to the quarry floor or to the existing stockpiling areas. Processing of new mineral for kilnstone will generate some waste (clays and Limestone, all natural materials won from the site). Where these materials cannot be sold to the aggregates market, surplus will be placed to storage. During Phase 2, the NE landform will be fully operational therefore surplus quarry waste and overburden shall be placed directly into this area, combined with the replacement of current in-situ soil profile.

4.2.24 . Blasting and removal of rock will be required to establish a sidings loading area at 387m AOD Further historic waste piles will be removed / sold or placed in the NE landform. A ramp to 370m AOD will be established with faces above improved.

4.2.25 All land within the application boundary shall be managed and maintained.

4.2.26 Mineral extraction in this phase is expected to release up to 14,000,000 tonnes.

Phase 3 Working up to 2042 - (Refer to Figure E)

4.2.27 Within this phase (2035 to 2042) there shall be an increased number of benches established. Mineral extraction will continue by method of drill and blast on the 340m AOD level. Initially quarry sinking will establish a deepened quarry floor at 325m AOD and 310m AOD levels. These areas may be periodically below the water table during periods of high rainfall in the winter due to elevated groundwater levels. Extraction shall be managed such that dewatering is not required. Additional quarry sinking will take place in the west of the site reaching level of 295m AOD with a series of 6 15m high faces and associated benches rising eastwards via vehicular ramps. The 295 m level is expected to be below the water table for extended periods during the winter months and dewatering will be required. Permits to allow dewatering shall be obtained prior to commencing extraction of this level.

4.2.28 There will be further ramps established between the working levels, this time along the southern boundary. Again, these will lead to leaving the extraction levels in an anticlockwise direction providing access to the rail sidings, stocking area and Lime plant. To facilitate the ramp structure, the existing rail sidings will be cut off by development at 385m AOD.

4.2.29 The processing of material will take place on the working benches and material shall be stored on the benches, or hauled to the quarry floor or to the existing stockpiling areas. Processing of new mineral for kilnstone will generate some waste (clays and undersize Limestone, all natural materials won from the site). Where these materials cannot be sold to the aggregates market, surplus will be placed to storage. During Phase 3, the surplus quarry waste and overburden shall be placed directly into the NE landform. As the landform increases in size the stocking area will decrease accordingly and stock can be kept within the extraction area. The new SE rail sidings will be fully operational. Additional working of the tips maximises available space for stocking and rail loadout. Surplus material from working the tips will be placed in the NE landform.

4.2.30 All land within the site will be managed and maintained.

4.2.31 Mineral extraction within this phase is expected to release 14,000,000 tonnes.

2042 Concept Restoration (Refer to Figure F)

As the Initial Review planning permission expires in 2042 a concept restoration plan has been prepared (Figure F) indicating the expected state of the quarry at this point in time. For indicative purposes this plan shows all plant, rail sidings and infrastructure removed and the remaining area to be left to naturally regenerate. Restoration of the north eastern landform would have been completed. Of course the expectation is that quarrying will continue to meet demands at that time and beyond.

Phase 4 Working to 2072 (Refer to Figure G)

4.2.32 This phase illustrates the maximum quarry development whilst being able to retain the existing plant site and rail sidings. Dry mineral extraction by drill and blast will advance on the existing levels to 310m AOD. Dewatering will continue to be required to work the 295m AOD with the addition of deepening the central and northern extraction area to 235m AOD.

4.2.33 Additional ramps will be established to the base of the quarry leaving the extraction area in an anticlockwise direction along the western and southern boundaries to access rail sidings, stocking area and Lime plant.

4.2.34 The processing of material will take place on the working benches and material shall be stored on the benches, or hauled to the quarry floor or to the existing stockpiling areas. Processing of new mineral for kilnstone will generate some waste (clays and Limestone, all natural materials won from the site). Where these materials cannot be sold to the aggregates market, surplus will be placed to storage. During Phase 4, the quarry waste will be placed to NW of the quarry void. Once the quarry base has been reached, the remaining surplus will be placed to the base of the extraction. The NE stocking area will continue to be operational. As the landform increases in size the stocking area will decrease accordingly and stock can be kept within the extraction area. All land within the site will be managed and maintained.

4.2.35 Mineral extraction within this phase is expected to release up to 37,000,000 tonnes.

Phase 5 Working to 2108 (Refer to Figure H)

4.2.36 The final phase is the final quarry design (FQD) with all mineral being extracted down to a base of 235m AOD.

4.2.37 Lime Kilns and rail sidings will be retained for as long as possible to continue working the mineral on site as long as possible. Eventually the Lime kilns and rail siding will be removed. Mineral processing will be undertaken by mobile plant within the quarry void, transported off site to be used in satellite Lime plants, or sold as aggregate. Stocking will be within the quarry void, or in the NE stocking area.

4.2.38 Mineral extraction by method of drill and blast shall advance to the east on the existing levels from 370m AOD downwards. Dewatering will continue at 295m AOD and below. Ramps will be created to allow vehicles to leave the quarry void anticlockwise along the western and southern boundaries.

4.2.39 Processing of the mineral will be on working benches. Materials shall be stocked on the benches, in the stockyards or hauled to the quarry floor.

4.2.40 Processing of new mineral for kilnstone will generate some waste (clays and Limestone, all natural materials won from the site). Where these materials cannot be sold to the aggregates market, surplus will be placed to storage in the quarry void. Tipped material will assist in creating ramps and stocking areas within the excavation area.

4.2.41 All land within the site will be managed and maintained.

4.2.42 Mineral extraction within this phase will release up to 78,000,000 tonnes.

4.3 Development of Siberia Tip

4.3.1 The phased quarry extraction as shown, details the progressive removal of Siberia Tip to permit recovery of mineral reserves beneath. The removal is progressive, and the design shows waste material within the tip to be worked from South to North as quarry development necessitates this. The screening benefit of the northern margin of Siberia tip is retained until at least 2042, and allows the new North East landform to be constructed and planted well in advance of the northern edge of Siberia Tip being removed during Phase 4 of mineral extraction. Where saleable mineral is encountered within Siberia Tip, this material will be processed and removed from site. Material unsuitable for sale will be placed to the NE landform (up to 2042, or into the Quarry void after this date).

4.4 Restoration Concept (Refer to Figure I)

4.4.1 A concept restoration plan has been prepared to demonstrate the situation in anticipation of all extraction operations in 2108 (see Figure I).

4.4.2 Concept details have been provided to illustrate the applicants proposed intentions at this stage. The key restoration objective will be to assimilate the peripheral landscape of the quarry into its local setting whilst allowing the natural regeneration of inner site quarry benches. The anticipated water level will be circa 295m AOD.

4.4.3 New areas of species rich grassland will be created around the periphery of the restored quarry and on the restored north eastern landform. This landform will be further supplemented with tree planting.

4.4.4 The agricultural land and sports pitches to the north of the rail line will be retained. The site access and haul road will be maintained to ensure access to the land.

4.4.5 All the restored land will be managed and maintained along with security along with health and safety requirements.

4.5 Aftercare and Management

4.5.1 The restored site would be closely monitored throughout the 5-year aftercare period so that the most suitable management regime could be defined on an area-by-area basis.

Replacements

4.5.2 All planting/seeding failures would be replaced on an annual basis, during the first five years of aftercare, to ensure 95% maintenance to the agreed stocking rate/densities, proportional mixture of species and/or land cover. All replacements would use plants of the same species or other such species as may be agreed with the planning authority. If abnormal plant or tree failure persists then investigations and proposals for the remedying of site conditions would be prepared and agreed with the planning authority.

4.6 Operating Hours

4.6.1 It is not proposed to modify the permitted operating times for the quarry in this planning application. The existing limits on the quarry's operating hours implemented

by condition 23 of the extant permission will continue to be adhered to, as set out below:

i) operations for soil stripping and the formation and subsequent removal of material from soil and overburden storage areas and waste disposal mounds: -

- 0800 to 1800 hours Monday to Friday
- 0800 to 1300 hours Saturdays

ii) limestone extraction and primary processing: -

- 0600 to 2200 hours Monday to Friday
- 0600 to 1300 hours Saturdays
- 0700 to 1900 on Sundays, provided that the developer has given the Mineral Planning Authority not less than 7 days notice, and that no such working shall take place on more than 15 Sundays in any period of twelve months.

There shall be no activities falling under categories i and ii above, on Bank Holidays or other Public Holidays.

For the avoidance of doubt other processing operations (including the operation of kilns), the servicing, maintenance and testing of plant, and the transport of excavated and processed materials from the site are unrestricted.

4.6.2 There may be exceptional circumstances, including emergencies, when operations will have to be undertaken outside these hours. In such circumstances the planning authority will be informed.

4.7 Employment

4.7.1 The existing quarry operation at Hindlow supports 35 direct full-time employees, all of whom are local. Not all employees are on site at any one time. On a typical day there are between 20-25 people on site. The mineral operations also rely upon support from local outside contractors employed by the applicant in roles such as haulage. The continuing operations at Hindlow Quarry will sustain the existing employment levels and secure these jobs in the long term.

4.7.2 As well as the maintenance of the jobs directly supported by the applicant at Hindlow Quarry, the economic success of the mineral operations that will result from the

continued working will also benefit other local businesses and services. A specific and direct example is the ongoing use of local hauliers in the export of product from the site which would continue to contribute to support local business and the local economy.

5 Environmental Impact Assessment

5.1 Introduction

5.1.1 In preparing the ES, the Company and its consultants have had regard to the contents of Schedule 4 of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017. Specifically, the ES has addressed the main elements of the proposals that have the potential to impact (positively and/or negatively) on:

- Human beings;
- Flora and fauna;
- Soil, water, air, climate and the landscape;
- Material assets and the cultural heritage;
- Interaction between the first three bullet points.

5.1.2 A Non-Technical Summary has been provided in Appendix 4.

5.2 Scoping

5.2.1 In accordance with good practice and the guidance provided in The National Planning Practice Guidance (NPPG) Paragraph 058 (Reference ID 4-058-20140306), the Applicant has sought the Mineral Planning Authority's Scoping Opinion. To assist the MPA in their judgment a report was prepared which provided an outline of the development proposal and broad consideration of its likely impacts. The Scoping opinion was requested from the MPA in June 2019.

5.2.2 The MPA responded to this request on 31ST July 2019 - see Appendix 2 - where they agreed that the proposals constituted EIA development, and set out their formal Scoping Opinion. In summary the topics to be assessed in the Environmental Impact Assessment are:

- Alternatives
- Socio Economic Assessment
- Soil Resources and Land Use
- Noise and vibration
- Air Quality and Dust

- Traffic and Transportation
- Archaeology
- Built Heritage
- Landscape and Visual Considerations
- Ecology
- Hydrology, Hydrogeology and Flood Risk Assessment
- Rights of Way
- Climate Change Adaptation
- Cumulative Impact

5.2.3 The ES assesses the aspects of the environment that are likely to be significantly affected by the development and has been done on an iterative basis. The ES has been prepared to comply with the requirements of Part 1 of Schedule 4 of the Regulations, 2017.

5.2.4 In preparation of the ES, consultation with statutory bodies on the main issues has been undertaken and has informed the relevant environmental assessment work.

5.2.5 The technical reports for the above assessment work are contained within the Technical Appendices to the Environmental Statement, Volume 2.

5.3 Statement of Community Involvement

5.3.1 In accordance with good practice and the advice within the National Planning Policy Framework, all developers proposing to submit planning application for major development should undertake an element of community involvement prior to submitting their application. Community involvement is an important part of the planning process and ensures that the views of the local community, as well as the numerous statutory consultees, are considered by the Applicant.

5.3.2 The Applicant recognises the importance of community involvement but it has not been possible to undertake detailed community engagement prior to the submission of the application because of the current ongoing Covid-19 restrictions.

5.3.3 In order to inform the community of the submission the applicant has sent out a leaflet to residents of Sterndale Moor and Earl Sterndale setting out the details of the ROMP submission. If the situation regard the Covid-19 restrictions improves later in the year

the applicant would be prepared to organise a public information exhibition at the quarry later in the year for local residents to attend.

5.4 Main Environmental Considerations

5.4.1 In reviewing the adopted and emerging planning policies relevant to the proposed development and the scoping opinion of the MPA, the following considerations are considered of particular relevance and are examined in more detail in the remainder of this Statement:

- Potential landscape and visual impact
- Potential for impact on nature conservation and ecology
- Potential for adverse impact upon amenity, particularly in regards to noise and air quality
- Potential blasting and vibration impacts
- Potential for impact on archaeology and cultural heritage
- Potential impact upon water resources
- Potential for flood risk
- The potential for impact as a result of transportation and traffic
- Potential impact upon soils, land quality and agriculture
- Cumulative Impact Assessment

All of the above are explored in further detail in the following chapters.

6 Alternatives

6.1 Introduction and Background

6.1.1 As set out in paragraph 041 (Reference ID: 4-041-20170728) of the Planning Practice Guidance, the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 do not require an applicant to consider all alternatives.

6.1.2 Notwithstanding this, where alternatives have been considered, Schedule 4 (Part II) of the Town and Country Planning (Environmental Impact Assessment) Regulations 2017 (the Regulations) provides that the information for inclusion in Environmental Statements should include *"A description of the reasonable alternatives (for example in terms of development design, technology, location, size and scale) studied by the developer, which are relevant to the proposed project and its specific characteristics, and an indication of the main reasons for selecting the chosen option, including a comparison of the environmental effects".* In accordance with Schedule 4, consideration of the main alternatives to the scheme, as studied by the applicant, is considered below.

6.1.3 The assessment of alternatives has had regard to the environmental assessment work undertaken by the Company's team of consultants and indicates where the assessment work has influenced the ultimate design of the scheme having regard to the potential for environmental effects.

6.2 Approach and Methodology

6.2.1 The assessment of alternatives has had regard to relevant Development Plan policy, Government planning guidance and the EIA Regulations 2017 together with its corresponding circular and good practice guide.

6.2.2 In terms of an overall approach it is considered to be neither practical nor necessary to look at every single alternative option. Instead, and in accordance with Government guidance, consideration of "main alternatives studied by the applicant" is undertaken below.

6.3 Not to submit a ROMP application

6.3.1 The quarry is operational and as noted the purpose of the ROMP is to ensure that the conditions attached to any mineral planning permissions for the development of the

site do not become outdated with the passage of time. The application is not therefore considering the merits of the development itself.

6.3.2 If the planning consent were not reviewed, the consent may lapse and an important strategic mineral reserve could, in effect, be lost. The mineral resource at this site is a proven, high quality industrial aggregate which has been worked over a considerable time period and is utilised in a variety of products at a local, county and national level.

6.3.3 Not submitting a ROMP application is therefore not the preferred option for the Company as it would result in the premature loss of a number of direct and indirect jobs and the associated input to the local economy and effectively sterilise mineral reserves that are nationally sought after.

6.4 Alternative Sources

6.4.1 According to the Derbyshire Local Aggregate Assessment 2019, “it is crucial that Derbyshire County Council and the PDNPA, as MPA’s for the area, are able to ensure a steady and adequate supply of mineral to realise these growth aims and to maintain the infrastructure already developed. Since the area also supplies a significant amount of aggregate to a large part of the country, particularly crushed rock, this need to maintain a steady and adequate supply of mineral applies to this much wider area”.

6.4.2 Derbyshire and the PDNP is one of the largest producers of aggregate grade crushed rock in this country. Crushed rock for aggregate is supplied from Derbyshire and the PDNP overwhelmingly from the carboniferous limestone in the Buxton locality. Quarries within the two local authority areas produced over 12.8 million tonnes of aggregate grade crushed rock in 2019.

6.4.3 Limestone is also a very important “industrial” mineral where its chemical properties make it a valuable mineral for a wide range of industrial/manufacturing uses. On average around 3 million tonnes of limestone of a quality to meet industrial use have been quarried annually within Derbyshire (DCC Industrial Limestone 2: Background Paper 2018). One such use for this industrial mineral involves the calcination (heating) of limestone which is used in the production of lime.

6.4.4 The price of industrial limestone products is largely governed by the cost of extraction, processing and transportation. The lime processing plants, such as Hindlow, associated with industrial minerals are generally large and require high capital investment. These facilities tend to be located in large quarries such as Hindlow which

has the potential to produce a large output over long periods of time. Because transport costs may exceed production costs, it is important for the quarry to have good road and rail links which Hindlow has. While the quarry was dormant, industrial limestone was imported in from Tunstead to ensure continuity of supply for the lime processing activities at Hindlow. With the resumption of production at Hindlow, which includes suitable industrial limestone, the quarry will become self-sufficient and avoid the importation of stone from other quarries.

6.4.5 This reflects a sustainable use of minerals which can be exported by both road and rail.

6.4.6 Although limestones occur widely in England, many are unsuitable for industrial use because of their chemical and physical properties. The carboniferous limestones of Derbyshire and the Peak Park are one of the most important resources of industrial limestone in England. The Bee Low limestones are units of consistently high purity and uniform chemistry. The Bee Low limestones at Hindlow are suitable for the existing lime works and will avoid the importation of this type of stone.

6.4.7 This reflects the importance of Hindlow which contains considerable reserves and forms an integral part of the company's long-term resources. Hindlow also forms an important part of the industrial limestone landbank for Derbyshire. Because of the wide diversity of industrial limestone markets and the chemical variability within some deposits, shortages in the availability of some particular qualities of mineral may occur which would result in the need for additional reserves. Therefore, it would not be sustainable to find alternative sources for such facilities as Hindlow which has considerable proven reserves, an existing lime processing facility and a rail link for the transportation of these minerals.

6.5 Alternatives to Primary Aggregates

6.5.1 There are two alternatives to Primary Aggregates – Recycled Aggregates and Secondary Aggregates.

6.5.2 Recycled Aggregates: derived from reprocessing materials previously used in construction. Examples include recycled concrete from construction and demolition waste material (C&DW) and railway ballast.

6.5.3 Secondary Aggregates: usually by-products of other industrial processes not previously used in construction. Secondary Aggregates can be further sub-divided into

manufactured and natural, depending on their source. Examples of manufactured secondary aggregates are pulverised fuel ash (PFA) and metallurgical slags. Natural secondary aggregates include china clay sand and slate aggregate.

6.5.4 The aggregates market supplied from recycled and secondary sources has risen to 29%. This 29% market share is nearly three times higher than the European average of 10%, highlighting the fact that the use of recycled and secondary materials in Britain is close to full potential (Source: Profile of the UK Mineral Products Industry - 2018 Edition).

6.5.5 The use of recycled and secondary aggregates is widely supported. However, they will never be able to wholly replace primary aggregates as there can never be a guarantee of supply of material of an appropriate quality to meet a specific demand. The fact that industrial limestone is valued for its physical and high purity chemical properties means that opportunities for its substitution and recycling are negligible.

6.6 Alternative Phasing arrangements

6.6.1 The Company have undertaken geological resource assessments at Hindlow Quarry which is set out in the geological chapter of the ES (Chapter 3).

6.6.2 The geological assessment indicates relatively consistent Iron (Fe), Magnesium (Mg), and Silicon (Si) levels throughout the proposed phased extraction. Variation has been noted in some attributes, such as Lead (Pb) and Manganese (Mn), however these are manageable with sufficient blending. No areas have been identified which would not be suitable for lime manufacture. It is therefore considered that the proposed phasing arrangements provide the preferred option in delivering a long term supply of both industrial and aggregate production whilst retaining both the existing lime processing facility and the rail link for the transportation of these minerals for the maximum period.

6.6.3 Quarry waste is anticipated as a by-product of creating lime and aggregate products. Waste is anticipated to comprise soils and overburden, rock processing waste materials (raw Limestone and Limestone/clay scalpings). Historically, waste materials have been placed in a series of tips which are shown on Figure J (Tips and Stockpiles Plan). These tips and stockpiles will eventually have to be removed to allow the recovery of minerals below. The current Planning Permission allows for the placement of this and future quarry waste within the “north eastern landform”, north of the

railway line (see Figure E – Phase 3 up to 2042) which is required to allow the exploitation of the mineral in accordance with the proposed phasing programme. Eventually, quarry waste will be backfilled into the quarry excavation but this will not take place until after 2042.

6.6.4 It is therefore concluded that the proposed arrangements for phasing and placement of quarry waste represents the preferred option.

6.7 Alternative Means of Transport

6.7.1 Hindlow has the benefit of both rail and road transportation of quarry products which allows the transportation of these products to wider regional markets.

6.8 Conclusions

6.8.1 In conclusion, the applicant has studied a number of alternative options regarding the proposed development. The proposed phasing scheme provides the best option for delivering an integral part of the company's long-term resources and supporting the continued supply of industrial and aggregate materials to meet a local, regional and national need.

6.8.2 The 'do nothing option' is not the preferred option for the Company as it would result in the loss of a number of direct and indirect jobs and the associated input to the local economy and effectively sterilise mineral reserves that are nationally sought after.

6.8.3 The proposals as submitted represent the most sustainable scheme.

7 Landscape and Visual Considerations

7.1 Policy Context

7.1.1 The Environmental Impact Assessment Directive (85/337/EEC) states that the direct and indirect effects of development should be assessed in terms of their impact on specific factors. Based on the factors identified in Article 3 of the EIA regulations, the direct and indirect effects of the proposal on the landscape and visual impact have been assessed. The interaction that the impact upon the landscape resource may have upon the flora and fauna and the alteration of landscape features upon human beings have also been assessed. The visual impact of the mineral operations being undertaken has also been assessed.

7.1.2 The main planning policy tests regarding landscape and visual impact are as follows:

- NPPF Section 15
- The Derby and Derbyshire Minerals Local Plan (April 2000)
    - Policy MP1 – The Environmental Impact of Mineral Development
    - Policy MP3 – Measures to Reduce Environmental Impact
    - Policy MP4 – Interests of Acknowledged Environmental Importance
    - Policy MP6 – Nature Conservation
    - Policy MP7 – Archaeology
    - Policy MP10 – Reclamation and After-Use
    - Policy DM4 – Landscape and Green Infrastructure
    - Policy DM5 – Biodiversity
- The High Peak Borough Council Local Plan (2016)
    - Policy EQ2 – Landscape Character
    - Policy EQ5 – Biodiversity
    - Policy EQ8 – Green Infrastructure
    - Policy EQ9 – Trees, woodland and Hedgerows

7.1.3 The thrust of these policies encompasses the advice in NPPF to protect, maintain and enhance the landscape. In terms of development in the countryside, consideration must be given to the potential for material impact upon the landscape and visual amenity.

7.1.4 A Landscape and Visual Impact Assessment (LVIA) has been prepared by Heatons (ES Volume 2 Technical Appendix A) which considers the assessment of the likely landscape effects and mitigation associated with the continued operation of Hindlow Quarry, along with an assessment of visual effects and mitigation.

7.1.5 The aim of the report is to understand the baseline landscape and visual resources and receptors within the Site and the local area and to assess their value and sensitivity to change resulting from the proposed phasing scheme. From this baseline position, to then assess the specific magnitude of effect of the detailed proposals on landscape and visual resources/receptors and to determine the Level of Significance of Effect on Landscape and Visual matters which could be potentially adverse/ or beneficial.

7.1.6 The LVIA has been prepared in general conformity with the 'Guidelines for Landscape and Visual Impact Assessment' 3rd Edition (GLVIA3), published by the Institute of Environmental Management and Assessment and the Landscape Institute in 2013 (Landscape Institute, 2013), Photography and Photomontage in Landscape and Visual Assessment and Natural England, An Approach to Landscape Character Assessment.

7.1.7 Data collation and assessment has been carried out utilising desktop and site survey work to identify baseline landscape character and visual nature and condition of the site in its local area. A description of the full Methodology and Assessment Process used is detailed within ES Volume 2 Appendix B of Technical Appendix A.

Development Proposals

7.1.8 At present, there are approximately 182 Million tonnes of permitted reserves of limestone remaining unworked at Hindlow Quarry. At the predicted rate of 2 million tonnes per annum this will take extraction operations well beyond the current permission expiry date in 2042, up to 2108. T

7.1.9 A series of 5 working phases has been devised which sets out the full extraction of the permitted reserves:

- Phase 1 – up to 2028;

- Phase 2 – up to 2035;
- Phase 3 – up to 2042;
- Phase 4 – up to 2072; and
- Phase 5 – up to 2108

7.1.10 The LVIA chapter will consider Phases 1 to 3 up to the year 2042 but phases 4 and 5 have been included in the assessment to set out the working programme beyond this date. This includes the concept restoration at 2108 (Figure I). Also, in order to set out the position of the quarry development at 2042 a restoration scenario has been included and is illustrated on Figure F. The 2042 scenario would see the removal of all quarry plant, buildings and machinery as required by the Initial review Permission. The 'part' quarried engineered faces and benches along with the 'part 'removed tips and bunds along with other areas of disturbed ground would be allowed to naturally regenerate with a vegetation cover.

7.1.11 The scenario in 2042 is only to indicate what the quarry restoration might look like at this stage but it is expected that the operations will be required beyond this date and will continue.

7.2 Consideration of the Potential for Impact

Landscape Designated Orientations

7.2.1 The western boundary of Hindlow Quarry abuts the Peak District National Park. The physical topography and landform of land within the National Park falling westwards. This combined with in situ rock ridges/dividing land between Brierlow Quarry to the north of Hindlow Quarry and Dowlow Quarry to the south result in three boundaries minimising potential intervisibility from the National Park. Topography and landform combine to the north east and east of the site to allow views from the National Park of the quarry and its activities.

7.2.2 There are Listed Buildings within Earl Sterndale and Abbotside Farm (~0.5 to 1km SW), Harley Grange and Dowall Hall (W) and Greatlow to the SE of the site. There are further listed buildings ~1 to 2km NE within Chelmorton.

7.2.3 Drawing No TAR-068-M-D.017 in ES Volume 2, Technical Appendix A - Appendix B illustrates the location of the Peak District National Park, Listed Buildings, Sites of Special Scientific Interest (SSSI), Scheduled Ancient Monuments (SAM), Special Areas of Conservation (SAC), Special Protection Area (SPA) and Local Nature Reserves (LNR).

Landscape Character

7.2.4 Landscape Character is assessed at a National, Regional and Local Level.

National

7.2.5 At national level the site falls within the White Peak NCA 52, however, its southern boundary is in close proximity National Character Area 53 South West Peak. Characteristics of NCA 53 are to be considered.

7.2.6 NCA 52 - White Peak

- *The White Peak NCA is characterised by elevated, gently undulating limestone plateau with occasional knolls and crags, dissected by steeply cut dales and gorges with rock outcrops, screes and caves.*
- *Mixture of seasonal and constant rivers. The steep dale sides contain a mosaic of flower-rich limestone grassland, ash woodland and wildlife-rich scrub.*
- *There are nucleated villages and small towns connected by crest and valley roads.*
- *There are Many visible reminders of early industry, including historic limestone and lead workings, lime kilns and dramatic water mills from the 18th-century textile industry.*

7.2.7 Mineral history within this area is as follows:

7.2.8 Two of the largest limestone quarries within the Peak District National Park are located within the White Peak: Tunstead Old Moor and Ballidon. Limestone from the White Peak supplies markets mainly in the Midlands, north-west and east England, and Yorkshire. Although active quarries can have a range of negative impacts on the environment and amenity of surrounding areas, they currently provide a source of local building stone, aggregates and chemical and industrial end use products. They also provide employment for local communities. The number of active limestone quarries has reduced in recent years, with some closing at the end of their permitted lives and some being 'mothballed' due to the current economic climate. Some disused quarry sites have been restored to provide new wildlife habitat and recreation opportunities, such as Horseshoe Quarry which is now a popular climbing site.

7.2.9 Hindlow Quarry is a part of a ribbon development of quarries running south east to north west, parallel to the A515 Ashbourne Road to Buxton Road to Hotspur Hill.

7.2.10 NCA 53– South West Peak

- *The South Peak is an upland landscape characterised by Carboniferous age Millstone Grit dissected by streams and rivers.*

- *There is an enclosed farmland landscape with pastoral character created by semi improved grassland, hay meadows, rushy pastures which are also marshy springs and flushes, more productive farmland and small woodlands.*
- *Predominantly dispersed settlements across the NCA.*
- *Long, uninterrupted views from margins to upland areas and vice versa, with contained and intimate views around the foothills and within the valleys. Views into Manchester, Wales, Shropshire, Staffordshire and over the Cheshire Plain are possible from the upland core, tors and ridges.*

7.2.11 Mineral history within the area is as follows:

7.2.12 There is only one small-scale active quarry within the South West Peak which provides local building stone. This is helping to conserve the local character of the historic built environment. There are the remains of former quarries throughout the area and there is pressure to open up some of these quarries to meet the needs of local building repairs and new developments.

7.2.13 Statements of Environmental Opportunities for both the NCA areas can be found in the LVIA within ES Volume 2 Technical Appendix A.

Regional

7.2.14 At a regional level Landscape Character is assessed by Derbyshire's 'The Landscape Character of Derbyshire' and Peak District NP Authority 'Peak District Landscape Strategy'.

7.2.15 Within 'The Landscape Character of Derbyshire' the site is located within Plateau Pastures apart from two small strips in the sites northern boundary which are Upland Limestone Pasture. See Drawing No TAR-068-M.d.003 in Appendix A of Technical Appendix A. Within the 'Peak District Landscape Strategy' the site could be affected and can impact upon three separate Landscape Characters due to intervisibility. These consist of Limestone Hills and Slopes, Limestone Plateau Pastures and Limestone Village Farmlands. All of these areas key characteristics are summarised below, detailed information regarding these character areas can be found within ES Volume 2 Technical Appendix A.

Plateau Pastures

<u>Key Characteristics</u>

- Gently rolling upland plateau
- Limestone outcrops on hill summits and steeper slopes
- Fine, silty brown soils over carboniferous limestone

- Small blocks of plantation woodland around villages and farmsteads
- Medium to large regular fields enclosed by dry stone walls
- Straight roads with uniform verges
- Nucleated limestone villages and isolated farmsteads with slate roofs
- Open landscape with long expansive views

Upland Limestone Pastures

Key Characteristics

- Undulating highland plateau with steep slopes
- Shallow loamy soils over carboniferous limestone
- Frequent bare rock outcrops and scree slopes
- Occasional plantations
- Large regular field patterns
- Occasional farmsteads

Limestone Hills and Slopes

7.2.16 This character designation overlaps with the Derbyshire Upland Limestone Pastures. Their characteristics are described very similarly however for accuracy the Peak District description can be found below.

Key Characteristics

- High, undulating, in places steeply sloping topography
- Frequent rock outcrops on steeper ground
- Rich, wildlife habitats including large patches of limestone grassland and heath on high ground
- Regular field patterns of medium to large scale.
- Occasional groups and belts of trees
- Prehistoric monuments often on hilltops
- Wide open views

Limestone Plateau Pastures

Key Characteristics

- Rolling upland plateau
- Pastoral farmland enclosed by limestone walls
- Regular field patterns of small to medium size
- Localised field dewponds and field limekilns
- Discrete tree groups and belts of trees
- Isolated stone farmsteads and field barns
- Medieval granges
- Lead mining and quarrying remains
- Prehistoric monuments, often on hilltops

- Open views to the surrounding higher ground

Limestone Village Farmlands

Key Characteristics

- A gently undulating plateau
- Pastoral farmland enclosed by drystone walls made from limestone
- A repeating pattern of narrow strip fields originating from medieval open fields
- Scattered boundary trees and tree groups around buildings
- Discrete limestone villages and clusters of stone dwellings
- Relict mine shafts and associated lead mining remains
- Localised field dewponds

Local

7.2.17 At the Local Level landscape elements and features need to be considered within the context of the linear ribbon of quarry development west of the A515. This corridor is visually disturbed with progressive change and built structures / urban elements such as the plants, sheds and structures associated with the mineral developments at: Dowlow Quarry, Hillhead Quarry and Hindlow Quarry as well as Harpur Hill Business Park.

7.2.18 At a site specific level the character is split by the rail line. The main quarry activities all take place west of the rail line (i.e the extraction area, soil stripping and overburden, processing area, stocking and rail siding). This is also the side which contains the bult structures on-site. The east of the rail line consists of the access road, undisturbed agricultural fields and woodland to the north, and sports pitches to the south.

Potential Landscape Impacts

7.2.19 The potential development could result in the following changes to landscape:

- An increase in the physical area of rock extraction as the phased development opens up the footprint of the quarry to its permitted area.
- An increase in the length and size of quarry benches and faces all around the periphery of the extraction area. The potentially most exposed of these being along the site's western boundary.
- The progressive removal of previously placed unprocessible rock from skyline tips within the quarry.

- The development of a new stocking area to the east of the rail line
- Creation of temporary soil storage/screening bunds- to be seeded and maintained
- The progressive construction of a North Eastern Landform to take overburden and unprocessible rock materials, together with previously placed tip material. This landform is to be seeded and tree/shrub planted
- The retention of the outer eastern and southern batter slopes of the South Eastern Tip, to be seeded and tree/shrub planted.

7.2.20 Landscape receptors need to be assessed in terms of their sensitivity, combining judgements of their susceptibility to the type of change or development proposed and the value attached to the landscape. For consistency we have assessed the landscapes sensitivity to change in respect of the five site locally defined and described character areas. The assessment of the sensitivity is stated in Table 7.1 below:

Table 7.1: Assessment of Landscape Sensitivity

Landscape Character Areas	Value	Susceptibility	Assessed Sensitivity to change from this type of quarrying / landform development
Plateau Pastures (Derbyshire)	Medium	Medium	Medium
Upland Limestone Pastures (Derbyshire)	Medium	Medium	Medium
Limestone Hills and Slopes (PDNP)	High	High	High
Limestone Plateau Pastures (PDNP)	High	High	High
Limestone Village Farmlands (PDNP)	High	Medium	High

7.2.21 The assessed magnitude of effect the development will have on landscape character is deemed 'High Effect' for both during the mineral extraction period and post restoration. Full details of the magnitude of effect can be found in Table 7.2 below.

Table 7.2: Assessed Magnitude of Effect from the proposed development on Landscape Character

Development	The principal development aspects involve the continued rock extraction which will create a quarry void down to 235m aOD. Extracted rock to be used either on site within the Hindlow Kilns or processed on site via mobile plant and transported either processed or as extracted by rail or road to point of sale. Existing quarry plant building/kilns to be retained. The other main aspects of the development will be the creation of the North Eastern Landform.	
Size/scale	The scale, size and geographical extent of the quarry extraction area during the operational period are both very large. The scale being a single void of a rectangular shape with a regular bench and face profile. The size of the elements being up to 135m (western boundary) comprised of engineered benches and faces. The length of the extraction area being ~1.2km by 700m width. Post restoration the quarried void will fill with ground water to ~295m aOD. The water body also being of a very large size and large scale single landscape element.	
Geographical extent	The proposed North Eastern Landform is large in size, scale and geographical extent. The landform being ~500m x 450m in size and of up to ~32m in height having the potential for geographical visual influence. It is also a new landscape element rising up on gently sloping ground, west to east.	
Duration	The next development of mineral extraction would take place over an ~19-year period up until 2042. At this time, if quarrying activity was to cease then all quarry plant, structures and machinery would be removed, and the 'part' quarried development would be allowed to naturally regenerate. This being based upon the quarry position of Phase 3 of the submitted scheme.	
Assessed Magnitude of effect	During the extraction period	High effect
	Post restoration	High effect

Assessment of Significance of Impact

7.2.22 The assessed significance of impact on the local character has been determined by combining the assessed sensitivity of the character areas the site is located within/ which it may have a geographical extent of influence, with the predicted magnitude of effect associated with the re-establishment proposals. This has provided an overall Significance of Effect value which describes the potential overall impact the proposed development will have on the local landscape character. For consistency and comparison, we have applied the same assessment to the current situation.

7.2.23 Tables 7.3, 7.4 and 7.5 summarise our assessment of the current Site's effect on the Landscape on the identified Landscape Character Areas and types.

Table 7.3: Current Site's effect on Local Landscape Character

LANDSCAPE CHARACTER AREA			
Landscape Character Area	**Sensitivity**	**Current Site Land use magnitude**	**Assessed level of significance**
Plateau Pastures (Derbyshire)	Medium	High (Adverse)	**Substantial (Adverse)**
Upper Limestone Pastures (Derbyshire)	Medium	Low (Adverse)	**Slight (Adverse)**
Limestone Hills and Slopes (PDNP)	High	High (Adverse)	**Substantial (Adverse)**
Limestone Plateau Pastures (PDNP)	High	Very Low (Adverse)	**Moderate (Adverse)**
Limestone Village Farmlands (PDNP)	High	Very Low (Adverse)	**Slight (Adverse)**

Table 7.4: The Proposed Development Effect on Local Landscape Character during the Operational Period

LANDSCAPE CHARACTER AREA			
Landscape Character Area	**Sensitivity**	**Proposed Operational Development Magnitude**	**Assessed level of significance**
Plateau Pastures (Derbyshire)	Medium	High (Adverse)	**Substantial (Adverse)**
Upper Limestone Pastures (Derbyshire)	Medium	Low (Adverse)	**Slight (Adverse)**
Limestone Hills and Slopes (PDNP)	High	Medium (Adverse)	**Substantial (Adverse)**
Limestone Plateau Pastures (PDNP)	High	Very Low (Adverse)	**Slight (Adverse)**
Limestone Village Farmlands (PDNP)	High	Very Low (Adverse)	**Slight (Adverse)**

Table 7.5: The Proposed Development Effect on Local Landscape Character during the Post Restoration period

LANDSCAPE CHARACTER AREA			
Landscape Character Area	**Sensitivity**	**Proposed Operational Development Magnitude**	**Assessed level of Significance**
Plateau Pastures (Derbyshire)	Medium	Medium (Adverse)	**Moderate (Adverse)**
Upper Limestone Pastures (Derbyshire)	Medium	Low (Adverse)	**Slight (Adverse)**
Limestone Hills and Slopes (PDNP)	High	Low (Adverse)	**Moderate (Adverse)**
Limestone Plateau Pastures (PDNP)	High	Low (Adverse)	**Moderate (Adverse)**
Limestone Village Farmlands (PDNP)	High	Very Low (Adverse)	**Slight (Adverse)**

Landscape Character Impact Conclusions

7.2.24 The Site is located within the Derbyshire Landscape Character Plateau Pastures area which is described as having the key characteristics of gently rolling upland plateau with limestone outcrops on hill summits and steeper slopes. It is an open landscape with long extensive views. Surface features upon the landform include small blocks of woodland and medium to large regular fields, enclosed by dry stone walls. Land east of the rail line, within the Site, currently displays many of the characteristics of the Plateau Pastures. To the west of the rail line, these characteristics are observed within the northern site area, where soils and agricultural land uses are in place along with woodland blocks on top of permitted rock extraction areas. Over the remaining Site area, the majority of land to the west is dominated by quarrying activities which have introduced large scale engineering and built development structures into the landscape. It is assessed that the overall Sensitivity to Change of the Plateau Pastures character area from quarrying activity is Medium, the area of the Plateau Pastures is relatively large and generally robust in respect of the key elements and features which comprise it. It is also site-specific medium sensitivity in that its undulating, gently rolling topographic and landform can help integrate potential large scale and size developments if they are located in appropriate locations.

7.2.25 As quarry activities have been taking place at Hindlow Quarry for many years, and the quarry has a current planning permission to continue to 2042, we have assessed the Current Effect of the quarry on landscape character. In respect of the Plateau Pastures we consider the current Magnitude of Effect is High. When this High Magnitude is combined with the Medium Sensitivity, this results in an existing Substantial Adverse level of Significance. We therefore consider that the existing quarry and its activities is resulting in a Significant Adverse Landscape Effect on the Plateau Pastures character area, in which it is located.

7.2.26 During the operational period of the quarry development, we assess the level of significance to continue and increase in area with the additional construction element of the North Eastern Landform. We consider that the resulting magnitude of effect during a part of the operational period will be Very High Adverse, when this is combined with the Medium Sensitivity, the resulting Significance of Effect will be Notable Adverse. Post 2042, and post restoration, we assess that the Significance of Effect will reduce to Moderate Adverse, as a result of the reduction in engineered landforms and features within the Site and restored integrated landforms and vegetation structure.

7.2.27 Land to the north of the Site is located within the Uplands Limestone Pastures (Derbyshire Character Area). We have assessed the Sensitivity of this area as Medium, with the Magnitude of Effect resulting from the existing quarry as Low Adverse, resulting in a Slight Adverse overall Significance of Effect. The main reason for this, being that although the character area is located adjacent to the Site, it has little influence on the character elements and features. This is as a result of physical barriers, including rock walls, roads, woodland blocks and built development. There is also very little intervisibility.

7.2.28 The western and north eastern Site boundaries abut the Peak District National Park Landscape Character Area – Limestone Hills and Slopes. This area being characterised by high, undulating, in places steeply sloping topography, which can allow views to distant skylines from regular field patterns of medium to large scale. As such, from a relatively small geographical area, there is intervisibility between the Hindlow Quarry Site and this character area. Where this occurs, we assess the Sensitivity of this character areas to be High. The Magnitude of Effect of the current quarry is considered Low Adverse, giving an existing Moderate Adverse Significance of Effects. We assess

that during the operational period, as a result of the removal of the quarries skyline tips, utilising excavators and dump trucks, along with the progressive construction of the North Eastern Landform, together with the associated temporary engineering landforms and progressive exposure of western facing quarry faces, that the Magnitude of Effect during this period to a very limited geographical extent, will be Medium Adverse. When combined, this results in a Substantial Adverse effect.

7.2.29 Post restoration principally post 2042, with the resulting constructed and restored North Eastern Landform (screening some of the Site from its character area), both intervisibility levels are reduced along with prominent engineered features. Proposed establishing vegetation planting works will also help to integrate the Site into its character setting.

7.2.30 As of a result of existing intervening landform and / or distance from the Site, it is not considered that the character areas of Limestone Plateau Pastures or Limestone Village Farmlands area, or will be, significantly affected by the current proposed quarry development.

7.2.31 During the operational period of the quarry development, we assess this level of significance to continue and increase in area with the additional construction element of the North Eastern Landform. We consider that the resulting Magnitude of Effect during a part of the operational period will be Very High Adverse. When this is combined with the Medium Sensitivity, the resulting Significance of Effect will be Notable Adverse. Post 2042 and post restoration, we assess that the Significance of Effect will reduce to Moderate Adverse as a result of the reduction in engineered landforms and features within the Site and restored integrating landforms and vegetation structure.

Visual Impact

7.2.32 This baseline and assessment work has been carried out by initially mapping the geographical extent of the study area where receptors have the potential to view the Current Site and the proposed development. This was carried out digitally through the production of Zones of Theoretical Visual Influence (ZTVI).

7.2.33 The Site survey considered the viewpoint from which the current situation and the proposal will actually be seen by differing groups of people. These groups included:

- Residential visual receptors in private properties

- Public viewpoints e.g., public rights of way, inland waterways and public open space (POS)
- Places where people work
- Transport routes where there may be views from private vehicles and from different forms of public transport

7.2.34 In ES Volume 2 Technical appendix A Drawing Number TAR-068-M-D.015A illustrates representative visual receptor locations from within the identified ZTVI of the proposed operational developments potential visual envelope. These receptor locations have been used to describe the types and levels of potential visual change and effect to local receptors. The visual receptor locations are illustrated looking towards the site on Photographic Sheets 1-9. These illustrate a representative section of existing and potential views of the Site and the development and site activities. These can be seen within ES Volume 2 Technical appendix A Appendix A. To illustrate the development proposals, receptor views from four representative locations (Visual Receptor refs. 3, 5, 7 and 23) have been produced in photomontage imagery. This addresses the proposed development at Current Situation, Phase 3 Operational and the Phase 3 Restoration Scenario at 2042.

7.2.35 Visual Receptor Location 3 (Photographic Montage Location 1) illustrates a current situation photographic view from users of the A515 Buxton to Ashbourne Road, opposite the entrance to Dowlow Quarry at a distance of ~500m from the Site. The main visual elements and features of Hindlow Quarry are the south eastern tip, Hindlow Plant Site and both Central and Siberia Tips, within the immediate visual context including agricultural fields, sloping down the A515, stone walling and woodland blocks. Dowlow plant site is also a component of this view. A montage illustrating operations within Phase 3, includes both changes to the existing quarry (reduction in the size of Chatters and Siberia Tips), the development of the eastern stocking area, the partly constructed North Eastern Landform an additional native tree and shrub planting within and around the quarry. The second montage illustrates the situation at a potential restoration scenario (2042). At this point, it is proposed that the North Eastern Landform is fully restored, and all plant and machinery has been decommissioned and removed from site.

7.2.36 Visual Receptor Location 5 (Photographic Montage Location 2) illustrates a current situation photographic view from users of the Buxton Juniors Football Club, adjacent

to the A515 Buxton to Ashbourne Road and the existing Site Access Road, from within the Site itself (to remain undisturbed). The main visual elements and features of Hindlow Quarry are the south eastern tip, Hindlow Plant Site and both Chatters Tip, Siberia Tip and the western quarry faces, within the immediate visual context including agricultural fields, sloping down the A515, stone walling and woodland blocks. A montage illustrating operations within Phase 3, includes both changes to the existing quarry (reduction in the size of Central and Siberia Tips), the development of the eastern stocking area, the partly constructed North Eastern Landform an additional native tree and shrub planting within and around the quarry. The second montage illustrates the situation at a potential restoration scenario (2042). At this point, it is proposed that the North Eastern Landform is fully restored, and all plant and machinery has been decommissioned and removed from site.

7.2.37 Visual Receptor Location 5 (Photographic Montage Location 2) illustrates a current situation photographic view from users of the Buxton Juniors Football Club, adjacent to the A515 Buxton to Ashbourne Road and the existing Site Access Road, from within the Site itself (to remain undisturbed). The main visual elements and features of Hindlow Quarry are the south eastern tip, Hindlow Plant Site and both Central Tip, Siberia Tip and the western quarry faces, within the immediate visual context including agricultural fields, sloping down the A515, stone walling and woodland blocks. A montage illustrating operations within Phase 3, includes both changes to the existing quarry (reduction in the size of Central and Siberia Tips), the development of the eastern stocking area, the partly constructed North Eastern Landform an additional native tree and shrub planting within and around the quarry. The second montage illustrates the situation at a potential restoration scenario (2042). At this point, it is proposed that the North Eastern Landform is fully restored, and all plant and machinery has been decommissioned and removed from site.

7.2.38 Table 7.6 summarises the visual receptors identified and the effects that have been considered with an assessment of their significance based upon the methodology described within ES Volume 2, Technical Appendix A - Appendix B.

7.2.39 This is first determined by assessing Sensitivity of Visual Receptors to change from this type of development proposal (Table 7.6) and then the magnitude of the visual effect, its size/scale, geographical extent, duration and reversibility (Table 7.7). A judgement

on the sensitivity of visual receptors and magnitude of the effect are then combined to assess the overall significance of visual impact/effects (Table 7.8).

Table 7.6: Sensitivity of Visual Receptors to Change

Receptor No	Visual Receptors	Assessed Susceptibility to change of Visual Receptors	Assessed Value of View	Overall Assessment of Sensitivity of Visual Receptor
1	Residents of Sterndale Moor looking west towards the Application Boundary	High	High	High
2	Users of PROW ref HP14/4/1	Medium	High	Medium
3	Users of A515 Buxton to Ashbourne Road	Low	Medium	Medium
4	Users of A515 Buxton to Ashbourne Road	Low	Medium	Medium
5	Users of Buxton Juniors Football Club located adjacent to the site	Medium	Medium	Medium
6	Residents of Sterndale Moor looking west opposite site entrance	Low	Medium	Medium
7	Users of PROW ref HP14/5/1 looking west over Sterndale Moor towards Application Boundary	High	High	High
8	Users of PROW ref HP14/5/1 looking west over Sterndale Moor	High	High	High
9	Users of PROW ref WD25/8/1 looking west	High	High	High
10	Users of PROW ref WD25/12/1 looking west across A515	High	High	High
11	Users of PROW ref HP14/8/2 at junction with A515	Medium	Medium	Medium

12	Users of PROW ref HP14/8/2 looking south adjacent to proposed North Eastern Landform	Medium	Medium	Medium
13	Users of PROW ref WD25/2/1 on Chelmorton Low looking south west	High	High	High
14	Users of Common Lane looking south	High	High	High
15	Residential properties within Dowlow Quarry	Medium	Medium	Medium
16	Users of the High Peak Trail	Medium	Medium	Medium
17	Users of PROW ref WD25/17/1 looking south	High	High	High
18	Users of PROW ref HP14/4/1 looking north west to Dowlow Quarry	Medium	Medium	Medium
19	Users of PROW ref HP14/4/1 looking north toward rock ridge	High	High	High
20	Users of PROW ref HP14/4/1 looking north	High	High	High
21	Users of PROW ref HP14/4/1 looking east	High	High	High
22	Users of PROW ref HP14/8/1 looking south east	Medium	Medium	Medium
23	Users of PROW ref H14/104/1 looking south east	High	High	High
24	Users of PROW ref HP14/8/2 with panoramic view.	Medium	Medium	Medium
25	Users of High Peak Trail looking north west	Medium	Medium	Medium

26	Users of Pippenwell Road looking west	Medium	Medium	Medium

7.2.40 As discussed, the main visual changes associated with the proposals are the continuation of soil stripping of land west of the rail line to expose and extract permitted rock, the creation of the North Eastern Landform utilising overburden and quarry waste and the removal of both the Siberia Tip and Central Tip within Phases 2 and 3. Other development visual changes include the establishment of a stocking area east of the rail line and accessed off the main vehicle route into the quarry. Stocks to be ~6 to 8m in height. A progressively increasing visual change is the expansion of the extracted quarry void to its full footprint will occur within Phase 1 to 3 with further additional deepening occurring in Phase 4 and 5 to achieve full depth.

Assessed overall Significance of Visual Effects

7.2.41 This is achieved by combining the separate judgements about sensitivity of the visual receptor and the magnitude of the proposed development (including any mitigation measures) on visual impacts/effects. See Table 7.7 below.

7.2.42 The overall level of significance of visual effects will vary throughout the life of the quarry development. To provide an assessment in respect of time chronology and commentary we have therefore assessed potential visual effect and change based on four phases of the development. These being the Current Situation, Phase 1, Phase 3 (2042) and at Post 2042.

Table 7.7 Assessed Overall Significance of Visual Effect over the life of the Quarry

Ref	Description of Visual Receptor	Receptor assessed level of sensitivity to the type of development/ change	Assessed Magnitude of Effect resulting from the Current Situation	Assessed Significance of Visual Effect from current situation	Assessed Magnitude of Effect resulting from Phase 1	Assessed Significance of Visual Effect resulting from Phase 1	Assessed Magnitude of Effect resulting from Phase 3 (2042)	Assessed Significance of Visual Effect resulting from Phase 3 (2042)	Assessed Magnitude of Effect resulting at Post Restoration	Assessed Significance of Visual Effect resulting at Post Restoration
1	Residents of Sterndale Moor looking west towards the Application Boundary	High	High Adverse	Notable Adverse	Very High Adverse	Major Adverse	High Adverse	Notable Adverse	Low Adverse	Moderate Adverse
2	Users of PROW ref HP14/4/1	Medium	Low Adverse	Slight Adverse	Low Adverse	Slight Adverse	Low Adverse	Slight Adverse	Low Beneficial	Very Slight Beneficial
3	Users of A515 Buxton to Ashbourne Road	Low	Medium Adverse	Slight Adverse	Medium Adverse	Slight Adverse	Low Adverse	Very Slight Adverse	Medium Beneficial	Slight Beneficial
4	Users of A515 Buxton to Ashbourne Road	Low	High Adverse	Moderate Adverse	High Adverse	Moderate Adverse	High Adverse	Moderate Adverse	Medium Beneficial	Slight Beneficial
5	Users of Buxton Juniors Football Club located adjacent to the site	Medium	High Adverse	Notable Adverse	High Adverse	Notable Adverse	High Adverse	Notable Adverse	High Beneficial	Substantial Beneficial
6	Residents of Sterndale Moor looking west opposite site entrance	Low	Medium Adverse	Slight Adverse	Medium Adverse	Slight Adverse	Medium Adverse	Slight Adverse	Medium Beneficial	Slight Beneficial
7	Users of PROW ref HP14/5/1 looking west over Sterndale Moor towards Application Boundary	High	Medium Adverse	Notable Adverse	Medium Adverse	Notable Adverse	Medium Adverse	Notable Adverse	Medium Beneficial	Notable Beneficial
8	Users of PROW ref HP14/5/1 looking west over Sterndale Moor	High	Medium Adverse	Notable Adverse	Medium Adverse	Notable Adverse	Medium Adverse	Notable Adverse	Medium Beneficial	Notable Beneficial
9	Users of PROW ref WD25/8/1 looking west	High	Medium Adverse	Notable Adverse	Medium Adverse	Notable Adverse	Medium Adverse	Notable Adverse	Medium Beneficial	Notable Beneficial
10	Users of PROW ref WD25/12/1 looking west across A515	High	Low Adverse	Moderate Adverse	High Adverse	Notable Adverse	Low Adverse	Moderate Adverse	Low Adverse	Moderate Adverse

11	Users of PROW ref HP14/8/2 at junction with A515	Medium	None	Neutral	Medium Adverse	Moderate Adverse	Medium Adverse	Moderate Adverse	Medium Adverse	Moderate Adverse
12	Users of PROW ref HP14/8/2 looking south adjacent to proposed North Eastern Landform	Medium	High Adverse	Notable Adverse	Very High Adverse	Notale Adverse	Medium Adverse	Moderate Adverse	Medium Adverse	Moderate Adverse
13	Users of PROW ref WD25/2/1 on Chelmorton Low looking south west	High	Medium Adverse	Notable Adverse	Medium Adverse	Notable Adverse	Medium Adverse	Notable Adverse	Low Adverse	Moderate Adverse
14	Users of Common Lane looking south	High	Very Low Adverse	Slight Adverse	Very Low Adverse	Slight Adverse	Very Low Adverse	Slight Adverse	Very Low Beneficial	Slight Beneficial
15	Residential properties within Dowlow Quarry	Medium	Low Adverse	Slight Adverse	Low Adverse	Slight Adverse	Very Low Adverse	Very Slight Adverse	Low Beneficial	Slight Beneficial
16	Users of the High Peak Trail	Medium	Medium Adverse	Moderate Adverse	Medium Adverse	Moderate Adverse	Medium Adverse	Moderate Adverse	Medium Beneficial	Moderate Beneficial
17	Users of PROW ref WD25/17/1 looking south	High	Very Low Adverse	Slight Adverse	Very Low Adverse	Slight Adverse	Very Low Adverse	Slight Adverse	Very Low Beneficial	Slight Beneficial
18	Users of PROW ref HP14/4/1 looking north west to Dowlow Quarry	Medium	Medium Adverse	Moderate Adverse	Medium Adverse	Moderate Adverse	Low Adverse	Slight Adverse	Low Adverse	Slight Adverse
19	Users of PROW ref HP14/4/1 looking north toward rock ridge	High	Low Adverse	Moderate Adverse	Low Adverse	Moderate Adverse	Low Adverse	Moderate Adverse	Very Low Adverse	Slight Adverse
20	Users of PROW ref HP14/4/1 looking north	High	High Adverse	Major Adverse	High Adverse	Major Adverse	High Adverse	Major Adverse	Low Adverse	Moderate Adverse
21	Users of PROW ref HP14/4/1 looking east	High	High Adverse	Major Adverse	High Adverse	Major Adverse	High Adverse	Major Adverse	Low Adverse	Moderate Adverse
22	Users of PROW ref HP14/8/1 looking south east	Medium	High Adverse	Notable Adverse	Very High Adverse	Notable Adverse	Very High Adverse	Notable Adverse	Medium Adverse	Moderate Adverse
23	Users of PROW ref H14/104/1 looking south east	High	Medium Adverse	Notable Adverse	Medium Adverse	Notable Adverse	Low Adverse	Moderate Adverse	Low Adverse	Moderate Adverse

24	Users of PROW ref HP14/8/2 with panoramic view.	Medium	Medium Adverse	Moderate Adverse	High Adverse	Notable Adverse	High Adverse	Notable Adverse	Medium Adverse	Moderate Adverse
25	Users of High Peak Trail looking north west	Medium	Low Adverse	Slight Adverse	Low Adverse	Slight Adverse	Very Low Adverse	Very Slight Adverse	Very Low Beneficial	Very Slight Beneficial
26	Users of Pippenwell Road looking west	Medium	Medium Adverse	Moderate Adverse	Medium Adverse	Moderate Adverse	Medium Adverse	Moderate Adverse	Low Adverse	Slight Adverse

Analysis of Assessed Significant Visual Effects

7.2.43 To assess the overall significance of visual effects consideration must be given to the Current Situation, Phase 1, Phase 3 (2042) and at Post Restoration. Table 7.8 within the LVIA at Technical Appendix A provides an overview of the assessed significance at each of the previously mentioned stages.

7.2.44 Table 7.8 below summarises the number of receptors which fall into each significance level as a result of the assessment.

Table 7.8: Significance levels of Visual Receptor Locations Impact

	Assessed Significance of Visual Effects	**Current Situation**	**Phase 1**	**Phase 3**	**Post Restoration**
Significant Level of Adverse Visual Effect	Major Adverse	2	3	2	-
	Notable Adverse	9	10	8	-
Non-Significant Level of Adverse Visual Effect	Moderate Adverse	7	6	7	10
	Slight Adverse	7	7	6	3
	Very Slight Adverse	-	-	3	-
	Neutral	1	-	-	-
	Very Slight Beneficial	-	-	-	2
	Slight Beneficial	-	-	-	6
	Moderate Beneficial	-	-	-	1
Significant Level of Beneficial Visual Effect	Notable Beneficial	-	-	-	4
	Major Beneficial	-	-	-	-
	TOTAL	26	26	26	26

7.2.45 The sensitivity of the receptor cohort is generally higher in respect of change associated with quarry type development in the wider landscape around Hindlow compared to many similar quarry developments as the susceptibility and value of views is raised given that many receptors are located within the Peak District National Park. Points to note include Significant Adverse Visual Effects are currently being experienced by representative receptors (11). The existing sources of visual magnitude of effect being the Hindlow Quarry plant site (which remains throughout the operational period of the quarry), the upper western quarried faces and benches (which will increase in length throughout Phase 1 and 3, but at a lower elevation), and the three main waste tips, Siberia, Chatter and the South Eastern Tip. The number of Significant Adverse Visual Effects is predicted to rise to 13 during the Phase 1 period. The increase principally arising from the construction activities associated with the

establishment of the North Eastern Landform. This will involve soil stripping, temporary creation of soil bunds, movement of construction plant, excavators, dump trucks and dozers and a change in landform and increase in height of ground levels. The increase also relates to the removal of previously placed unprocessible rock material from existing tips. The tips (specifically Siberian Tip) being a main skyline feature of a large size but set at distance from the majority of potential receptors. The number of predicted Significant Adverse Visual Effects reduces to 6 within Phase 3. The principal reduction relating to both the removal of the majority of Siberian Tip and the establishment, seeding, tree/shrub planting of the southern aspect of the North Eastern Landform. The tips are to be progressively removed from the west of the length. This approach allowing excavators and dump truck movements to mainly take place behind the in-situ tip profile to views from the majority of potential receptors, located to the east of the Site. The levels of magnitude of effect from quarry activities also reducing to receptors located to the south/south east of the site as a result of remediation/planting works to the South Eastern Tip. Its outer landform being retained and vegetation establishing over time to help integrate it into its setting. Please note that if the quarry were to cease rock extraction at 2042 with all plant, built structures and machinery being removed the remaining 'part' quarried site with engineered benches and faces, part removed tips and areas of disturbed ground would in effect be the restoration scenario, with land allowed to naturally regenerate (see Figure F). Based upon this scenario we consider that the potential assessed level of magnitude of effect on visual receptors would be very similar to that of the assessed Phase 3 operation period considered within Table 7.8. We consider this to be the case as the main elements and features resulting in visual disturbance will remain, even with the removal of plant, structures and machinery. We therefore assess and conclude that the assessed level of Visual Effects relating to this Restoration scenario will be very similar to the general description and individually considered representative visual receptors as assessed and stated for the Phase 3 operational period. **Therefore, if quarrying were to cease in 2042 the restoration scheme at this time would continue to result in Adverse Significant Visual Effects to local visual receptors.**

7.2.46 Given the size, scale and setting of Hindlow Quarry and the proposed development elements it is assessed that there will be no overall beneficial visual effects until the quarry is finally restored. The plant site, progressive tip restoration, creation of the

North Eastern Landform and the current and potential increase in higher elevational quarried benches and faces will continue to result in adverse levels of visual effect during the operational period. At Post Restoration all plant, rail sidings and other built structures would be removed from site. All tips would have been removed from the skyline and areas of higher elevation disturbed land will have been extracted and now at a lower elevation. The western 'back face' of the quarry will remain as an engineered form and will have increased in length compared to the current situation. In general, a combination of the extracted rock (when weathered), the screening effect of the North Eastern Landform and retained and restored South Eastern Tip, with tree shrub and grassland establishment and the outer periphery of the site will help visually integrate the quarry into its wider setting specifically to the north east and south east of the site. Receptors located to the north, west and south having none or very limited views of the site as a result of natural landform and/or retained adjacent rock ridges to both Brierlow and Dowlow Quarries.

7.2.47 A description of the assessed receptors receiving a Significant Adverse Visual Effect from the current quarry and/or the proposed development is provided below. Receptor Ref 1 are the residents of Sterndale Moor looking west towards the Application Boundary at a distance of ~100 to 300m and the quarry beyond have a wide view of the active quarried western ridge including activities at Dowlow, Hindlow and Brierlow Quarries. In relation to Hindlow receptors currently view the plant site, tips and areas of the quarried face. It is considered that these receptors are of High Sensitivity and the current magnitude of visual effect form the quarry is High. The resulting assessed Significance of Visual Effect being Notable Adverse. This effect is Significant adverse. The level of magnitude is considered to increase within Phase 1 as receptors will be able to view both the removal of material from Siberia Tip as a skyline feature and the creation and establishment of the first stage of the North Eastern Landform. The resulting High Sensitivity combined with the Very High Magnitude resulting in a Major Adverse Level of Significance of Visual Effect. This effect is Significant. The magnitude of effect is considered to reduce in Phase 3 as the outer eastern and southern slopes of the North Eastern Landform will have been created and restored. Receptors will still view the quarry plant site, east facing either Siberia and Chatter Tip and other disturbed land which is assessed to result in a High Adverse Magnitude of Effect. When this is combined with the High sensitivity of the receptor, a Notable Adverse Level of Significance occurs. This effect is Significant adverse.

7.2.48 Receptor Ref 5, users of Buxton Junior Football Club/ pitches are located adjacent to the site access east of the quarry and south of the proposed North Eastern Landform. The sensitivity of these receptors is considered Medium. The reason for this being that receptors are coming to this area to play or watch sport. Although the quarry is a long-standing visual feature and an incongruous, engineered form, it is clearly visible in close proximity to the sports activities. As such the current level of magnitude of effect resulting from Hindlow Quarry is assessed as High Adverse. This results in a combined Notable Adverse level of Significance of Visual Effect. This is Significant adverse. The magnitude of effect is considered to rise during Phase 1 with receptors having the ability to view the change in form/ removal of Siberian Tip and the creation of the North Eastern Landform. The resulting magnitude of effect rising to Very High Adverse and a resulting Notable Adverse Significance of Effect. This effect being Significant adverse. The magnitude of effect reduces to Medium from the plant site and partial removal of tips during Phase 3 and once the southern slopes of the North Eastern Landform have been completed, seeded and planted and Siberian Tip removal. Given the other existing quarry elements and features, viewed from this location, we still however consider that the resulting level of significance will remain Notable Adverse. Post Restoration it is considered that the magnitude of effect will be High Beneficial resulting in a Substantial Beneficial level of Significance of effect.

7.2.49 Receptor reference 7 and 8 Users of PROW HP14/5/1 and Receptor 9 Users of PROW WD25/8/1 look west towards the quarry from increasing distances from above the village of Sterndale Moor. The receptors are considered to have a High sensitivity as they are located within the Peak District National Park even though receptors are transitory. The magnitude of effect from the current situation of the quarry and during Phase 1 of the development is considered a Medium Adverse Effect which results in a Notable Adverse Level of Significance which is Significant Adverse. This reduces to a Moderate Adverse Level of Significance at Phase 3 as the quarry tips are removed, the North Eastern Landform is established and seeding, and planting grows. Notable Beneficial levels of Significance are predicted Post Restoration.

7.2.50 Receptor reference 10, users of PROW ref WD25/12/1 look west across the A515 towards the Application site at a distance of ~300m. The current assessed Level of Significance of Visual Effect being considered Moderate Adverse. This is not Significant. During Phase 1 it is considered that the level of visual significance

experience to the transient users of the PROW will increase to Notable Adverse which is a Significant adverse effect. This will result from the progressive construction and restoration of the North East Landform. This effect reduces to Moderate Adverse at the end of Phase 3/completion of restoration of the North Eastern Landform. It is considered that this level of adverse visual effect will remain Post Restoration due to the change/loss of view when receptors look west.

7.2.51 Receptor ref 12, users of PROW ref HP14/8/2 look south adjacent to the proposed North Eastern Landform and towards the existing quarry. The disturbed landforms and quarry plant along with a section of the higher elevated western quarry faces are currently visible. It is assessed that the current Level of Significance of Visual Effect to the receptors is Notable Adverse. This effect is Significant adverse. At Phase 1 and during the construction stages of the North Eastern Landform in Phases 2 and 3, soil stripping, bunding and the construction of the landform will be clearly visible to users of this section of PROW. During this period, it is assessed that the magnitude of effect will be High Adverse which when combined with Medium Sensitivity of the transient receptors will result in a Notable Adverse significance level. At Post Restoration, this level is considered to remain Moderate Adverse as the current original view will be lost / foreshortened by the creation of the North Eastern Landform, but with mitigation landform and seeding / tree planting.

7.2.52 Receptor ref 13 users of PROW Ref WD25/2/1 on Chelmorton Low looking south west towards Hindlow Quarry at a distance of ~2.3km are assessed as of High Sensitivity due to the receptor location within the National Park. Hindlow Quarry and the proposed operations are visible as a skyline feature as part of the ridge of quarries which are located outside of the National Park boundary. The magnitude of effect is considered to remain consistent at Medium from the Current Situation, and during Phases 1 to 3. This principally relates to the scale and size of the development and disturbed land rather than any specific individual operation or quarry feature due to the distance from the site. The resulting Level of Significance of Effect being Notable Adverse during the operational period. At Post Restoration with the removal of the plant site / structures associated with it and the rail sidings, combined with the progressive removal of tips and planting works and weathering of rock faces it is assessed that the Level of Significance of Visual Effect will reduce to Moderate Adverse, which is not significant.

7.2.53 Receptor reference 20 and 21 users of PROW ref HP14/4/1 are located immediately adjacent to the upper western quarry face/permitted rock extraction areas. Receptors have direct and immediate views of previous land, current extraction benches and faces, the deepening quarry void, all tips, quarry plant site and the existing/ proposed area of rail sidings. It is assessed that receptors using this section of PROW are of a High Sensitivity and the Current and Phases 1, 2 and 3 quarry operations will all be of a High Magnitude of Effect. This combines to result in these transitory visual receptors receiving a Major Adverse Significance of Effect. This is Significant adverse. At Post Restoration receptors will look down into the restored quarry which will comprise a large water body, surrounding rock faces and benches set within a wider panoramic view of the Peak District. It is assessed that the magnitude of effect at this stage will be Low Adverse which when combined with the High Sensitivity of the receptors will result in a Slight Adverse Level of Significance of Visual effect.

7.2.54 Receptor reference 22 Users of PROW ref HP14/4/1 look south east over the undisturbed remaining permitted area of mineral extraction towards the existing northern flank of Hindlow Quarry. Siberia Tip is clearly visible as is the previously extracted southern faces and parts of the eastern and western quarry benches and faces. Soil stripping works to expose rock is also visible. The sensitivity of receptors using the section of PROW are considered Medium. The route is not within the National Park and users are transitory. The current magnitude of effect is considered High resulting in a Notable Adverse Level of Significance of Visual Effect. The level of magnitude is considered to increase during phases 1, 2 and 3 as the extraction progresses towards this receptor, the quarry void/ footprint becomes larger which increases visual access to quarry operations and plant site/ proposed rail sidings. This is assessed to result in a Very High Adverse Magnitude of Effect. When this is combined with the medium sensitivity of the receptor a Notable Adverse Significance of Visual Effect is predicted to occur. At Post Restoration the magnitude lessens to Medium Adverse with a Moderate Adverse Level of Significance of Visual effect.

7.2.55 Receptor reference 23 footpath route HP14/104/1 is located ~800m north east of the Application Boundary. The receptor view includes Brierlow Quarry, Hindlow Quarry's Siberia Tip and the upper elevation extracted southern and western quarry faces. Users of this representative receptor are located within the Peak District National Park and as such are considered of a High Sensitivity due to the high landscape/amenity

designation value. The magnitude of effect is currently judged as Medium Adverse resulting in a Notable Adverse Significance of Visual Effect. It is considered that this level will remain during Phase 1 and reduce to Moderate Adverse at the end of Phase 3 once Siberia Tip has been removed combined with progressive restoration works. With large areas of quarried/engineered faces being visible Post Restoration, it is assessed that a Moderate Adverse Significance of Visual Effect will remain.

7.2.56 The final representative receptor 24, which is assessed to receive a Significant Level of Visual Effect being users of PROW ref. HP/14/8/1. Receptors are considered of Medium Sensitivity as the route is not located within the National Park. Receptors have a current southern and western view of Hindlow Quarry and its features and activities. The Level of Significance of Visual Effect being assessed as Moderate Adverse which is NOT Significant. During Phases 1, 2 and 3 soil stripping to expose rock, subsequent quarrying activities, works to remove existing quarry tips and the construction of the North Eastern Landform will all be clearly visible to users of this section of PROW. Parts of views of the quarry development will be screened by existing landform and temporary soil storage/screening bunds. It is assessed that the level of magnitude of effect during Phase 1, 2 and 3 will increase to High Adverse which when combined with the Medium Sensitivity of the receptor will result in a Notable Adverse Significant Visual Effect during the Phase 1 to 3 period. Post Restoration large areas of quarry faces, and benches will be visible together with the large water body. Given proposed restoration/integration works it is assessed that the magnitude of effect at this stage will be Medium Adverse which combined with the Medium Sensitivity of the transitory receptor will result in a Moderate Adverse Level of Significance which is NOT significant.

Potential for cumulative landscape and visual effects

7.2.57 In considering the likely significance it must be borne in mind that the majority of the current and potential future changes associated with the combined quarries will be the permitted expansion of extraction footprints, but mainly the progressive deepening of quarry voids. It must also be considered that the permitted / proposed developments are all located in a very large scale and expansive landscape where variations in topography and landform are common and have the capacity to both screen and contain character areas and visual envelopes. These factors limiting both the potential for significant effects on character areas which vary within the combined

quarries geographical context and prevent the majority of potential visual receptors having views of all or a number of the combined quarries from any one fixed receptor location. Potential cumulative visual effects could occur if they are sequential in nature, for example users of the local public right of way network or road users who travel along the A515 / other roads in proximity to all quarries.

7.2.58 The above has been considered along with the detailed proposed development at Hindlow Quarry including the construction and permanent retention of the North Eastern landform.

7.2.59 There are *"active and historic limestone quarries"* located to the north-west of Hindlow Quarry (Hillhead Quarry and Brierlow Quarry) and south-east (Dowlow Quarry). The 'corridor' of quarries from Harpur Hill to the north and the southern area of Dowlow Quarry near Hurdlow Grange covers approximately 6km. These quarries have existing planning permissions and are currently being considered by recent planning ROMP reviews. The footprints of these quarries do on the whole, already comprise either disturbed ground, active rock extraction, stocking areas, rail sidings, plant / built structures and tips. There are also smaller areas of agricultural land which will be stripped to expose rock for future extraction, processing, and sale off site.

7.2.60 In respect of landscape character, we do not consider that likely significant cumulative effects will occur either on the physical fabric of the landscape or the special value of surrounding land designated as National Park.

In respect of the potential for cumulative visual effects there are individual and sequential visual receptors specifically associated with the local public rights of way network including The High Peak Trail, HP14/4/1 and HP14/4/2 located to the west of Hindlow / Dowlow / Brierlow Quarries and HP14/8/1 and WD25/8/1 to the east where receptors currently do and will continue to receive adverse visual effects from the individual / combined quarries of Dowlow, Hindlow and / or Brierlow Quarry. The individual impacts are however considered to be of similar levels of impact either based upon individual visual magnitudes of effect and / or cumulative magnitudes.

7.2.61 It is therefore assessed that there will **not be** any significant cumulative effects on either landscape character or visual amenity.

7.3 Consideration of Potential Mitigation

7.3.1 To mitigate the potential for impact on visual receptors, the following measures are proposed to be incorporated into the proposal:

- Maintaining the current limit of extraction to ensure both natural western quarry landform boundary and the existing ridge of rock between Hindlow and Dowlow Quarries and the proposed ridge of rock/in situ surface/PROW are retained. These landforms screening the majority of views from potential receptors located to the west, north and south of the quarry.
- The retention of the outer southern and eastern slopes and higher ground of the South Eastern Tip. This landform is to be supplemented by the establishment of species rich grassland and tree/shrub planting to 'green up' and enhance its potential for screening the quarry from receptors located to the south and south east of the site. This landform will also continue to screen much of the existing and new rail sidings proposals from these receptor locations.
- Where possible it is proposed to strengthen and add a new native woodland planting block/screen along the full length of the northern boundary of the rail line within the site boundary. This will provide both an element of visual screening and also the establishment of a vegetative corridor for landscape structure and potential use as a wildlife corridor.
- The removal of the visually prominent Siberia and Central Tips and their skyline engineering form.
- The establishment of the North Eastern Landform is required to ensure there is sufficient void space to place unprocessible rock and overburden material before rock can be bottomed out within the quarry. Once this extraction process is achieved all remaining unprocessible rock material will be directly placed into the quarry void. To aid in the assimilation of the North Eastern Landform its general morphology and height has been designed to reflect that of the local area whilst leaving land to its south available for potential further sustainable energy generation, subject to a future potential planning application. To limit the potential area of disturbance at any one time period from the construction of this landform it is to be progressively restored utilising in situ soils from the footprint of the landform and seeded with

species rich grassland. A woodland block is to be planted around the northern and eastern periphery to help visually integrate the proposal landform feature. See Drawing No. TAR-068-M_D.020 of Appendix A in Technical Appendix A.

- The use of localised soil storage/screening bunds will occur to screen potential low-level views of the proposed stocking area and the mineral extraction area. The bunds will be seeded and maintained.
- The existing tree belt alongside the A515 provides an effective screen for properties at Sterndale Moor. This will be maintained and managed during the course of future quarrying activities at Hindlow. The details of this management scheme are included in Figure L.

7.4 Landscape and Visual Conclusions

7.4.1 The LVIA has been undertaken in general conformity with the 'Guidelines for Landscape and Visual Impact Assessment' 3rd Edition (GLVIA3) published by the Institute of Environmental Management and Assessment and the Landscape Institute in 2013 (Landscape Institute, 2013).

7.4.2 The site is not located within a nationally designated landscape. Its western and north eastern boundaries do however abut the Peak District National Park and areas of the National Park have intervisibility with the site.

7.4.3 At the National Level, the site is located within National Character Area 52 – White Peak. At the Regional Level, the character is assessed by Derbyshire's 'The Landscape Character of Derbyshire' and Peak District National Park Authorities 'Peak District Landscape Strategy".

7.4.4 The site being located within Derbyshire's Plateau Pastures, gently rolling uplands plateau character area, with limestone outcrops and hill summits, and steeper slopes with medium to large regular field enclosed by dry stone walls.

7.4.5 The current site development effects have been assessed on this character type along with the Derbyshire Upland Limestone pastures and Peak District National Park's Upland Plateau Pastures, Limestones Hills and Slopes and Limestone Village Farmlands. It is concluded that the existing site development is resulting in Significant Adverse Effects on the Derbyshire Plateau Pastures Character Area (Notable Adverse), and that the Significance of Effect will continue throughout the life of the operation

development. The reasons for these adverse effects being the main current quarry features of the plant site, rail sidings, tips, engineered quarry faces and progressive soil stripping, combined with the proposed tip removal and construction of the North Eastern landform. It is assessed that none of the other identified character areas will be significantly adversely affected.

7.4.6 Post Restoration, it is assessed that the highest adverse Significance of Effect, will be Moderate Adverse, which is not significant.

7.4.7 In respect of visual matters, a combination of existing local landform topography and the location of potential visual receptors, limits both the potential geographical visual envelope and the level of potential Magnitude of Effect to representative visual receptors.

7.4.8 Visual mitigation measures to be fully integrated into the scheme include maintaining the current limit of extraction to retain areas of higher land to the west, north and south of the quarry, and thus limit potential views of mineral extraction. New native woodland landscape and screen planting to the western and / or eastern boundary of the rail line. The progressive removal of visually prominent tips from west to east, behind potential receptor views. The establishment of a North Eastern Landform which will both screen some potential views of the quarry from receptors in the east, along with the localised topographic construction of soil screening bunds.

7.4.9 It is assessed that the current Quarry and its associated activities result in 11No. Significant Adverse visual effects and that during Phase 1 of the proposed operational period of the quarry, this number will rise to 13No, falling to 10No. during Phase 3. It is concluded that the sources of the Significance adverse effects are mainly already present within the current scheme. These being the plant site / kilns, tips and extracted quarry benches and faces. The proposed additional screening of inward visual effects being the progressive construction of the North Eastern landform.

7.4.10 At Post Restoration, it Is assessed that there will remain 13No. adverse visual effects on representative receptors. None of these will be Significant Adverse. Here will be 4No. Notable Significant Beneficial receptor Effects, and 9No. further beneficial effects.

7.4.11 It is therefore concluded that overall, the proposed future development during its operational period will result in a general continuation of existing effects on landscape

and visual receptors, within a relatively restricted geographical area to the immediate boundary and east of the site. These adverse effects reducing in intensity / level and number of receptors receiving them as tips are removed from the skyline / eastern locations, and the North Eastern Landform is created and established. With beneficial effects resulting at Post Restoration to visual receptors.

7.4.12 Given the above assessment and the historic quarrying context at Hindlow Quarry, together with the site not being located within the Peak District National Park, we conclude that the proposed development would not conflict with the original purposes of the national park designation (as defined by the Environment Act 1995) or its special qualities (as defined in PDNP Management Plan 2012-2017). In particular, "*the flow of landscape character across and beyond the national park boundary*" would not be significantly adversely effected.

7.4.13 Hindlow Quarry is a permitted development which takes place over along period of time. In respect of landscape and visual matters, it needs to be considered within this context. Even though it is assessed that there are currently and will be future significant adverse effects on landscape and visual receptors, the effects will be reduced overtime. The effects predicted are not dissimilar to those currently experienced. The mitigation and restoration proposals embedded within the scheme will help integrate the development further into its setting in the long term. We consider that the continued development is acceptable and appropriate in Landscape and Visual terms, and in accordance with the identified landscape orientated designations and policies within Derbyshire.

8 Nature Conservation and Ecology

8.1 Policy Context

8.1.1 The Environmental Impact Assessment Directive (85/337/EEC) states that the direct and indirect effects of development should be assessed in terms of their impact on specific factors. Based on the factors identified in Article 3 of the EIA regulations, the direct and indirect effects of the proposal on species and habitats have been assessed.

8.1.2 The most relevant policies applicable to the consideration of potential impact upon ecology and nature conservation are as follows:

- NPPF Section 15
- The Derby and Derbyshire Minerals Local Plan (April 2000)
  - Policy MP3 – Measures to Reduce Environmental Impact
  - Policy MP4 – Interests of Acknowledged Environmental Importance
  - Policy MP6 -Nature Conservation – Mitigation Measures
  - Policy DM4 – Landscape and Green Infrastructure
  - Policy DM5 - Biodiversity
- The High Peak Borough Council Local Plan (2016)
  - Policy EQ5 - Biodiversity
  - Policy EQ8 – Green Infrastructure

8.1.3 The thrust of these later policies encompasses the advice in the NPPF to protect, maintain and enhance nature conservation and biodiversity. The policies seek to protect species and habitats and, through conservation, restoration, and enhancement.

8.1.4 Stephen Whitcher has undertaken a Preliminary Ecological Appraisal (PEA) to assess the potential for impact on habitats and species as part of the ROMP application. The Preliminary Ecological Appraisal is appended in Technical Appendix B.

8.1.5 A separate confidential Badger Survey and Mitigation Strategy (March 2021) prepared by Steven Whitcher is appended in Technical Appendix B.

8.1.6 A separate Bat Appraisal (March 2021) prepared by Baker Consultants is also appended in Technical Appendix B. The recommendations of this more recent report with regard to bats supersede the recommendations in the PEA (Technical Appendix B).

8.2 Consideration of Potential Impact

8.2.1 An Ecological Impact Assessment (EcIA) has been commissioned to support the application for the ROMP at Hindlow Quarry. The initial ROMP determination was granted on 28th April 1998, which included a schedule of conditions controlling the quarrying operations (Appendix 1). On the 27th November 2014, Derbyshire Country Council approved a Non-Material Amendment (NMA) reference NMA/1014/32 to Planning Permission CHA/1156/3, which voluntarily introduced a new condition requiring ecological survey of the Phase 1 area prior to the resumption of quarrying and working of minerals following the mothballing of operations.

8.2.2 The wording of the condition states *"Prior to resumption of working of minerals in Phase 1, the developer shall commission a survey of the Phase 1 working area and submit a report of the survey to the MPA. Where a new ecological interest is recorded, no extraction shall commence before the developer has submitted a scheme of ecological mitigation measures and that the scheme has received the approval in writing of the MPA. The mitigation measures shall be implemented as approved."*

Designations

8.2.3 A desktop study was conducted to identify existing records of protected / notable species or habitats within 2km of the survey area. There are nationally designated (statutory) sites within 2km of Hindlow Quarry, these consist of:

- Topley Pike & Deep Dale Site of Special Scientific Interest (SSSI) – located 850m to the north;
- Peak District Dales Special Area of Conservation (SAC) – located 850m to the north;
- Chrome & Parkhouse Hills SSSI – located 1.2km to the southwest;
- Fox Hole Cave SSSI – located 1.5km to the southwest

8.2.4 None of the statutory sites will be impacted upon by operations at Hindlow Quarry.

8.2.5 There are six locally designated (non-statutory) sites designated within 2km of the site, including one within the boundary and one adjacent to it:

- Brierlow Grange Meadow Site Local Wildlife Site (LWS) – a small area of unimproved calcareous grassland (0.08Ha) located along the northeast boundary of the site adjacent to the A515;
- Brierlow Quarry Grassland and Verges LWS – a further area of unimproved calcareous grassland (0.9Ha) located immediately to the northwest;
- Hindlow Grassland and Road Verge LWS – located 380m to the northwest,
- Morland Complex LWS – located 425m to the north,
- Greatlow field Pond LWS – located 750m to the east,
- Dowlow Green Lane LWS – located 1km to the southeast

8.2.6 Brierlow Grange Meadow Site LWS is within the site boundary but outside the extraction area. Quarry operations will not directly impact on the site through damage or loss of habitats. Negative impacts could stem from: light levels, change in hydrology, alterations to landform and vegetation. Changes in these factors could impact the vegetation on site, which is the reason for its designation.

8.2.7 Other non-statutory sites lie within 2km of the site shall not be directly or indirectly impacted upon by the operations at Hindlow.

8.2.8 There are a further five sites classed as Grade 3 sites, which the Derbyshire Wildlife Trust (DWT) identify as area of interest but not sufficient to class as LWS. Again, this includes one within and one adjacent to the site boundary:

- A515 Shelter Belt – located along the eastern boundary of the site adjacent to the A515,
- Track near Hindlow Quarry – located immediately to the southwest,
- Blinter House Grassland – located 1km to the east,
- Blinter House Road Verge – located 1km to the east,
- Hillhead Plantation – located 2km to the northwest

8.2.9 Potential impacts to the A515 Shelter Belt are in line with that of the Brierlow Grange Meadow Site LWS, with the same environmental changes having potential to negatively impact the site.

8.2.10 Other Grade 3 sites within 2km of the site shall not be directly or indirectly impacted upon by the operations at Hindlow.

8.2.11 Overall, the proposed quarry operations would therefore potentially have a long-term negative impact on a single non-statutory LWS and a single Grade 3 site, which is assessed as a negative impact at a local level.

Habitats

8.2.12 In addition to desktop studies, a Preliminary Ecological Assessment (PEA) was carried out by ecologist Stephen Whitcher. A Habitat Map (ES Volume 2 Appendix I, Technical Appendix B) shows the distribution of habitats across the site.

8.2.13 The most prominent habitat consists of 'Other Neutral Grassland' – g3c (9.29ha), g3c-58 (42.39ha) and g3c-123 (21.52ha). g3c and g3c-58 habitats are assessed as having relatively low ecological value, however, g3c-123 was assessed as having moderate ecological value.

8.2.14 The second largest habitat area is the 'Inland Rock, Quarry s1-105' occupying 26.96ha of the site. These are the existing quarry faces which have not recently been worked and display some plant species growing from the rocks. The quarry provides suitable opportunities for a range of species, most notably bats and birds, that may utilise the quarry faces for nesting and roosting. Therefore, the quarry was assessed as providing a moderate / high ecological value.

8.2.15 Finally, the third largest habitat present on site is the 'Unsealed Surface u1c' totalling 16.22ha. Here there are abundant tracks, parking areas and other storage areas around the quarry that are hard standing but unsealed, comprising packed stone or earth. The unsealed areas are predominantly subjected to regular disturbance.

8.2.16 The DWT hold one historic record of spring cinquefoil (*Potentilla tabernaemontani*), a Derbyshire Red Data Book Plant Species, along the south west site boundary. The plant was not identified during the PEA, therefore, if it is present on the site, the ongoing operations may have an impact on it.

8.2.17 The majority of habitats present within the surveyed areas displayed limited botanical value, although the habitats do present opportunity for fauna. Some habitats displayed a higher ecological value due to botanical diversity, or value for fauna,

however these are the areas of scrub and woodland and the grassland with calcicoles, growing on the current tips, which have less nutrient rich substrate.

8.2.18 Phased quarry operations will impact on all habitats on site on a rolling basis. The key impacts are the loss of woodland through all phases, and the loss of existing nutrient poor soil tips identified to support species rich grassland, most notably during Phases 1 and 2. Creation of new stockpiles has potential to impact existing habitats, designated or notable sites through changes in the environmental conditions.

8.2.19 Overall, the impact on habitats is deemed as being negative at a site level because some habitats would be lost during the phased quarry operations. Regarding cumulative impacts, the habitats identified during the PEA all lie entirely within land associated with Hindlow Quarry and therefore the habitats will not be directly impacted by works carried out on adjacent land.

Fauna

Amphibians

8.2.20 There were several ponds identified within the site and surrounding area. No Great Crested Newts, or other amphibians, were identified during the PEA and there are no records of amphibians within 2km of the site.

8.2.21 In the event that amphibians are present within the site, the phased quarrying operations will have an impact on the species through loss of suitable habitats if they are present within the worked areas of the quarry. However, amphibians are unlikely to be present on site and any impacts are likely to only affect individual amphibians and not significant populations, therefore, impact is assessed as negative at a site level.

8.2.22 Considering cumulative impacts, Hindlow is situated between two other working quarries, Brierlow and Dowlow. Ecological information at these sites do not identify any presence of amphibian populations within the sites. Any population at Hindlow could be impacted by working at Brierlow and Dowlow but due to the likelihood that there is a lack of an amphibian population it is unlikely there will be a cumulative impact.

Badgers

8.2.23 Badgers are considered in the separate confidential badger survey and mitigation strategy dated March 2021 in ES Volume 2 Technical Appendix B.

Bats

8.2.24 A bat appraisal has been undertaken by Baker Consultants as part of the survey work involved during the recommencement of quarrying operations on production faces at Hindlow and this is found in Technical Appendix B. This appraisal built upon the earlier survey work undertaken by Steven Whitcher during the preparation of the PEA (Technical Appendix B).

8.2.25 The habitats within and around the quarry were assessed for their suitability for bat habitat in accordance with Bat Conservation Trust Guidelines.

8.2.26 The scale and character of large quarries such as Hindlow makes detailed inspection of potential roosting features difficult. Unstable ground, loose rock, the height of faces and ongoing quarrying operations all provide significant constraints to the safe inspection of potential roost features within quarry faces. This is even the case with the use of mobile elevated work platforms (MEWP) that is often employed to inspect tall buildings. With this health and safety constraint, close inspection of potential roosting features within the quarry faces could not be undertaken, except from a distance in order to identify the general level of roosting potential within the faces.

8.2.27 A number of visual inspections has been undertaken between August 2020 and February 2021 by both Steven Whitcher and Baker Consultants on the production faces about to be worked.

8.2.28 Anabat express bat detectors and thermal camera surveys were employed to survey the bat activity around the quarry.

8.2.29 In accordance with the Bat conservation Trust guidelines, the landscape character on and around the site is considered to offer low suitability as bat habitat – it has “suitable but isolated habitat that could be used by small numbers of commuting and foraging bats ”. The site and surrounding area is open and generally featureless, with only small areas of plantation woodland and little variation in vegetation structure. It is an elevated altitude and wind swept. There is limited connectivity across the landscape for bat commuting and there are no significant foraging opportunities within and around the site.

8.2.30 The desk study indicated that the numbers of bat records in the area are low and are located within low-lying valley locations, rather than on the higher plateau areas.

Birds

8.2.31 The site is suitable for a range of bird species, with some notable species known to be present. These include peregrine falcons and swifts. During the survey peregrine falcons were identified over the quarry, house martins and swallows were identified in large numbers in several areas of the site. Nests were also visible in some areas of the site showing that the site provides suitable nesting opportunities for a range of species.

8.2.32 The phased operations on site will allow for retention of areas of habitat which are suitable for all notable species mentioned above. The phases up to 2042 retains the existing buildings and does not propose extraction of previously worked faces along the southern edge of the quarry, therefore, the long-term impacts on these species will be negligible.

8.2.33 There is potential for regional level impact to nesting birds due to the disturbance during quarrying, the loss of potential nesting sites and potential disturbance to nests, during the nesting season.

8.2.34 It is unlikely that there will be any cumulative impacts from work in the surrounding areas as the impacts from working will predominantly be on nesting birds.

Invertebrates

8.2.35 Habitats present within the site are suitable for a variety of invertebrates. No notable species are known to be present within the site, although high levels of invertebrate activity was recorded in the grasslands.

8.2.36 Impacts upon invertebrates is unlikely to impact above site level. There will be notable changes in habitats, however, many habitats will remain present throughout all phases.

8.2.37 The operations at both Brierlow and Dowlow quarries will continue the ongoing creation and loss of invertebrate habitats. Invertebrates at Hindlow will experience the same impacts, although these are seen as both positive and negative.

Reptiles

8.2.38 There are a range of habitats present on site that provide suitable refugia, foraging and connective habitats for reptiles. There are no known records of reptiles on site, although reptiles are present in the surrounding area, but no reptiles were identified during the PEA.

8.2.39 In the event there are reptiles present within the site, the phased operations will have an impact on the species through the loss of suitable habitats during all phases of operation.

8.2.40 Any impact will only affect individual reptiles and not significant population and therefore the impact is assessed as negative at a site level.

8.2.41 Ongoing works at Brierlow and Dowlow quarries hold the potential to impact upon reptile populations if they are present. Due to the lack of existing records within the surrounding area and the low likelihood of reptiles being present it is unlikely that there will be a cumulative impact on reptiles.

8.3 Consideration of Potential Mitigation

8.3.1 Mitigation measures for the protection of habitats and species are outlined below.

Protection of Designated Sites

Brielow Grange Meadow Site LWS and the A515 Shelter Belt Grade 3 site will be retained in their entirety during the phase quarrying operations. The stockpiling adjacent to the sites in Phases 1 and 2 and the tree planting on the completed stockpile in Phase 3, a standoff will be retained to the sites. The standoff will be a minimum of 15m, in line with Natural England's standing advice for ancient woodland, and will be marked out in a manner that will ensure that there are no vehicle movements within the area, and that tipped materials do not extend within the standoff.

Residual Impacts

8.3.2 The residual impact on the LWS and Grade 3 sites will remain a negative impact at a local level. Although the impact on the sites will be reduced there may still be some impact through changes in environmental factors. The mitigation will reduce this to levels that should not impact on the reasons for the site operations.

Habitats

8.3.3 Prior to each phase of the quarrying thorough surveys of sensitive habitats, such as the areas of grassland with calcicoles and the areas of scrub and woodland, will be carried out to re-assess the habitats and identify the presence of notable flora species, such as spring cinquefoil.

8.3.4 The phased quarrying includes habitat creation on the stockpiled areas and within the new north eastern landform, which will replace the habitats lost during the quarrying. The habitat creation will be carried out in a manner that will suitably replace the habitats currently present on the site and will include the translocation of plants or seed banks, if considered necessary.

8.3.5 Areas of scrub and woodland will be planted using locally sourced native tree and scrub species. The planting will be subject to a suitable aftercare provision that will ensure that plants are established.

8.3.6 Areas of grassland will be created using nutrient poor limestone material that will encourage the growth of diverse grassland of a calcareous nature. The areas will be seeded using a locally sourced calcareous/limestone grass and wildflower mix that does not include agricultural grasses or common forbs. The grassland will be managed in a way that will encourage diversity, and if grazed, will not be intensively grazed or seeded with agricultural species.

Residual Impacts

The residual impact on habitats would be negligible at a site level. Although habitats will be lost during the phased quarry operations the habitats will not all be lost at the same time. Lost habitats will be replaced, with specific management to ensure that the created habitats retain a similar, if not improved, species.

Amphibians

8.3.7 Precautionary working methods for amphibians will be implemented during all works on site with particular care being taken during the clearance of undisturbed ground. The precautionary working methods will introduce :

- Briefings for all site personnel on the potential presence of amphibians on site and what to do if amphibians are encountered,

- Vegetation clearance works will be phased to reduce the potential impact on amphibians. An initial clearance of vegetation will be carried out to no lower than 150mm. The area will then remain undisturbed for a period of at least 24 hours, to allow amphibians to move away, before the vegetation is cleared to the ground and the soil is stripped,
- Soil stripping will avoid the peak hibernation period, January and February, where possible to reduce the potential for the works to disturb hibernating amphibians,
- Areas of high value terrestrial habitat, such as long undisturbed rock piles, will be carefully searched for the presence of amphibians, where feasible to do so,
- Aquatic habitats that require removal will be drained down during the winter months, to avoid breeding amphibians, and a hand search will be carried out to establish if amphibians are present,

Any amphibians encountered during the work will be carefully moved to areas of suitable refugia outside the quarry workings.

Residual Impacts

8.3.8 The residual impact on amphibians will be a negligible impact at a site level. Amphibians may still be impacted by the ongoing quarry operations although precautionary measures will reduce the likelihood that the quarrying will impact on individual amphibians.

Badgers

8.3.9 See separate confidential report on Badger Survey and Mitigation (ES Volume 2 Technical Appendix B).

Bats

8.3.10 It is considered that a suitable level of bat survey and habitat/roost assessment has been conducted to assess the risks of resumed quarrying at three production faces. No further works are recommended at these faces.

8.3.11 Further survey, such as evening emergence, transect and /or automated survey is recommended prior to resumption of quarrying at other faces within the quarry that have not been worked in recent years. It is understood that this only applies to faces to the south east of the main quarry void. If these surveys indicate the likelihood of

roosts being present, then appropriate mitigation measures will be required prior to quarrying works commencing on that face.

8.3.12 If bats are unexpectedly discovered after development has started then all works that could harm bats or damage/obstruct their roosts must stop. Expert help must be sought from a qualified ecologist as soon as possible before works continue.

8.3.13 Mitigation and compensation methods for impacts on bats, can include the following:

- changing the location of the work
- changing work methods or timing to avoid bats
- creating, restoring or improving roosts (and replacing any that will be damaged or removed)
- creating, restoring or improving habitats including foraging areas
- managing and maintaining habitats in the long term
- monitoring the roost status after the development.

Residual Impacts

8.3.14 The residual impact on bats will be a negative impact at a site level. Surveys prior to each phase of the quarry operations will ensure that all bat species are identified and mitigated for, maintaining the favourable conservation status of bats on the site, and in the local area. However, there will be some disturbance to bats present on the site during the quarry reduced to negligible at a site level.

<u>Birds</u>

8.3.15 Any works that commence on the site during the nesting season (March to September) and could impact on nesting birds, including blasting quarry faces, building works, vegetation clearance or soil stripping, will be immediately preceded by a thorough nesting bird survey, carried out by a suitably experienced surveyor.

8.3.16 Any nests identified will remain undisturbed, from works over and above the normal activity present in that area, until the young have fledged from the nest.

8.3.17 carried out ahead of all works that commence during the nesting season. Any nests identified remaining undisturbed until the young have fledged.

Residual Impacts

The residual impact on birds will be a negligible impact at a site level. Surveys will ensure that any nests present are identified and remain undisturbed although there will be some disturbance impacts from the quarry operations.

Invertebrates

8.3.18 No mitigation required.

Residual Impacts

The residual impact on invertebrates will remain a variable impact, including both positive and negative impacts at a site level due to the loss and creation of habitats suitable to support invertebrate assemblages.

Reptiles

8.3.19 Precautionary working methods for reptiles will be implemented during all works on site with particular care being taken during the clearance of undisturbed ground. The precautionary working methods will include:

- Briefings for all site personnel on the potential presence of reptiles on site and what to do if reptiles are encountered,
- Vegetation clearance works will be phased to reduce the potential impact on reptiles. An initial clearance of vegetation will be carried out to no lower than 150mm. The area will then remain undisturbed for a period of at least 24 hours, to allow reptiles to move away, before the vegetation is cleared to the ground and the soil is stripped,
- Soil stripping will avoid the peak hibernation period, January and February, where possible to reduce the potential for the works to disturb hibernating reptiles,
- Areas of high value terrestrial habitat, such as long undisturbed rock piles, will be carefully searched for the presence of reptiles, where feasible to do so,
- Any reptiles encountered during the work will be carefully moved to areas of suitable refugia outside the quarry workings.

Residual Impacts

8.3.20 The residual impact on reptiles will be a negligible impact at a site level. Reptiles may still be impacted by the ongoing quarry operations although precautionary measures will reduce the likelihood that the quarrying will impact on individual reptiles.

8.4 Ecological Conclusions

8.4.1 Both Desk and Field study techniques have been utilised to assess the impacts of the proposed quarrying operations at Hindlow quarry.

8.4.2 Without mitigation measures in place, it has been assessed that the quarry would largely only negatively impact ecology at a site level. Following the mitigation measure outlined above , these impacts would be reduced to negligible.

8.4.3 No significant impacts are anticipated on any statutory or non-statutory sites designated for their nature conservation or ecological value.

8.4.4 In terms of ecology and nature conservation, the mineral operations at Hindlow Quarry will not have unacceptable direct or indirect impact on population and human health; biodiversity; land, soil, water, air and climate and the landscape; or the interaction between these factors in accordance with EIA regulations.

8.4.5 It is proposed that the ecological condition (See paragraph 8.2.2) which has now been incorporated into the ROMP permission via the Non-Material amendment is included on the proposed schedule of conditions (Appendix 3) which could incorporate the mitigation measures outlined above. This should be reviewed regularly in line with changing guidance and quarry requirements.

8.4.6 In conclusion, the objectives of NPPF, the Development Plan and other material policy considerations are met.

9 Noise

9.1 Policy Context

9.1.1 The Environmental Impact Assessment Directive (85/337/EEC) states that the direct and indirect effects of development should be assessed in terms of their impact on specific factors. Based on the factors identified in Article 3 of the EIA regulations, noise has the potential to impact human beings and fauna.

9.1.2 The most relevant policies applicable to the consideration of potential impacts of noise emanating from the proposed development are as follows:

- NPPF Section 17
- The Derby and Derbyshire Minerals Local Plan (April 2000)
    - Policy MP3 – Measures to reduce Environmental Impact
    - Policy DM1 – Development Management Criteria
- Planning Practice Guidance
- Noise Policy Statement for England (NPSE)

9.1.3 The thrust of these policies is to ensure that development does not cause an unacceptable adverse impact in terms of noise. The policies seek to ensure the protection of sensitive receptors and users.

9.1.4 In order to assess the potential noise impacts of the development a noise assessment has been undertaken by Vibrock. The detailed findings of the assessment are attached at ES Volume 2 Technical Appendix C. A summary of the findings is provided below.

9.1.5 The Vibrock noise assessment reviews the extant planning conditions from the Initial Review 1998 Planning Permission (Reference No.1.776.3 granted by Derbyshire County Council) to evaluate the potential noise emissions from on-going site operations permitted up to 2042.

9.1.6 The conditions on the permission which control noise levels are Conditions 24 through 28, wording of which can be found below:

- Condition 24 - Except as specified in accordance with condition 25 below the freefield level of noise generated at the site and received at any noise sensitive property shall not exceed:

- 55dB expressed as a 1 hour Laeq between the hours of 0700 and 1900.
- 45dB expressed as a 1 hour LAeq between the hours of 1900 and 2200.
- 42dB expressed as a 1 hour LAeq between the hours of 2200 and 0600.
- 45dB expressed as a 1 hour LAeq between the hours of 0600 and 0700.

- Condition 25 - Where operations which are noisy and temporary (as defined in Minerals Planning Guidance Note 11) are necessary, the daytime noise limit in condition 24 may be exceeded for periods not exceeding eight weeks in any one period of twelve months throughout the duration of the quarry. During these periods the limit of noise levels received at any noise sensitive property shall be 70 dB Laeq, 1 hour, freefield, between the hours of 0800 and 1800 Mondays - Fridays and 0800 and 1300 Saturdays. Outside these hours the limits in condition 24 shall apply.
- Condition 26 - All vehicles, plant and machinery operated on the site shall be silenced and maintained in accordance with manufacturers' specifications. Save for the purposes of maintenance, no machinery shall be operated with the covers open or removed.
- Condition 27 - Noise emitted from the site shall be monitored in accordance with a scheme which has the written approval of the Mineral Planning Authority. No quarrying operations shall resume before such approval has been given. The scheme shall include details of all proposed noise - monitoring equipment, its location and noise measuring procedures in accordance with the requirements of paragraphs 44 and 45 of MPG 11 (or any replacement thereof). The scheme shall be implemented forthwith on its approval by the Mineral Planning Authority. The Authority shall be provided with all noise monitoring records and results in accordance with these approved details.

- Condition 28 - Reversing warning devices fitted to any new items of mobile plant, and replacement warning devices fitted to any existing items of mobile plant, shall be in accordance with details which have received the prior written approval of the Mineral Planning Authority

9.1.7 A Noise Management and Monitoring protocol was submitted to the MPA in May 2017 which was approved on 20th July 2017 under Condition No.27 of the 1998 Initial Review Planning Permission. This scheme is included in ES Volume 2 Technical Appendix C.

9.2 Consideration of Potential Impact

9.2.1 As part of the assessment, background sound levels have been undertaken and measurements were made at two locations which reflected those detailed within the site's approved noise management and monitoring protocol. These locations were at the settlement of Sterndale Moor (R2) opposite the site access point, and East Sterndale (R1) which is approximately 350m south west of the quarry boundary.

9.2.2 The results found that noise at R1 mainly comprised sound from road traffic on B5053, and other local links, birdsong and livestock. At R2 sound comprised road traffic along the A515 and occasional noise emitting from Hindlow Quarry. Full results can be found within the Noise Report in Technical Appendix C, although it can be noted that results were in line with those collected by AECOM in June 2020 as part of their annual monitoring and management protocol at the site.

9.2.3 During each time period, at each monitoring location during the assessment, the 'predicted worst case scenario' was below the extant planning condition 24 limit. The time periods assessed are those outlined in condition 23 of the extant permission.

9.2.4 The assessment also considered the short term/temporary operations, which consist of activities such as soil stripping and bund formation which can be undertaken up to 8 weeks in any one year, the extant condition 25 for temporary operations limits noise levels to 70dB $L_{Aeq.1h.}$ At the two assessed receptors the 'predicted worst case scenario' is 44dB at R1 and 52dB at R2, well below the permitted limit.

Cumulative Impacts

9.2.5 Hindlow Quarry is located in between Brierlow Quarry to the north west and Dowlow quarry to the south east. Therefore, there is potential for cumulative impacts to arise.

Both Brierlow and Dowlow quarries are over 700m from the receptor locations considered within the assessment. Due to that distance, it is unlikely that noise levels from these quarries will exceed that of Hindlow quarry. Predicted worst case scenarios in normal operations at R1 is 41dB and at R2 is 48dB, these are 14dB and 7dB below the permitted 55dB rate, allowing room for potential noise contributions from Breirlow and Dowlow.

9.3 Consideration of Potential Mitigation

Monitoring procedures

9.3.1 Vibrock recommend that noise emission from the site continue to be routinely monitored in accordance with the site's noise management and monitoring protocols to ensure compliance with noise limits on conditions.

9.3.2 In order to ensure that noise levels remain within the acceptable limits, monitoring will be undertaken at the following measurement locations at a frequency of not less than once per year. Measurements shall also be conducted during any key stages of site development as determined by the Company management in consultation with the MPA and HPBC. For example, the creation of the outer flanks of the North Eastern landform.

Table 9.1 - Monitoring locations

Measurement Location	Monitoring Position
Earl Sterndale	R1
Sterndale Moor	R2

9.3.3 In the event that monitoring establishes that the noise impact from site operations is having negligible effect upon the noise environment at the measurement locations or that other noise sources not associated with site operations are the primary influence, it is proposed that the requirement for routine monitoring will be reviewed in consultation with the MPA and HPBC.

9.3.4 The instrumentation used to monitor the noise levels will meet the standards specified in BS EN 61672: Part 1: 2013.

9.3.5 The monitoring will be undertaken with reference to the methods and procedures provided specifically in clauses 5.1, 6.2 and 6.4 of BS 4142: 2014 + A1: 2019, *'methods for rating and assessing industrial and commercial sound' (British Standards Institution 31.10.14)* and BS5228-1: 2009 + A1: 2014 Annex G, at times when it is known that the site is fully operational.

9.3.6 Monitoring will be undertaken by competent persons and only at times when it is known that the site is fully operational.

9.3.7 Measurements will be made in accordance with the procedure below:-

- the instrumentation will be calibrated on site both before and after use in accordance with the manufacturer instructions using a UKAS certified acoustic calibrator;
- measurement height between 1.2 to 1.5 metres above the ground;
- instrument setting - fast time response and A weighted;
- 15-minute measurement periods; and
- recorded measurement parameters - LA10, LA90 and LAeq;

9.3.8 Monitoring will not be undertaken if it is considered that the prevailing weather conditions could detrimentally affect the measurements either by generating extraneous noise or by influencing sound propagation. Such weather includes wind speeds which are greater than $5ms^{-1}$, low ambient temperatures or rain. The weather conditions at the time of the Noise Assessment were dry and settled.

9.3.9 So far as is reasonably practicable, monitoring shall be undertaken to ensure that all site operations are representatively assessed and in the event of steady noise conditions a minimum fifteen-minute measurement period shall be adopted at each agreed location. This will include both manned and unmanned measurements being carried out.

9.3.10 Within six weeks of each monitoring exercise site management will ensure that a report is prepared detailing the monitoring results. The report shall include the following information:-

- the aims of the assessment;
- monitoring locations and measurement position;
- influencing factors upon the noise environment;

- monitoring procedures including any deviation from the procedures detailed in this scheme;
- meteorological conditions including weather, wind speed/direction, cloud cover and ambient temperature;
- monitoring instrumentation used;
- measurement duration;
- site activates taking place during the measurement periods;
- measurement results; and
- discussion of results.

9.3.11 All relevant records pertaining to the measurement and recording of noise will be retained by the Company site management and a copy will be held on site and be available to for inspection by authorised officers of the MPA and HPBC.

9.3.12 The Company shall supply copies of any noise monitoring reports to the MPA and HPBC if requested.

Suppression measures

9.3.13 Best practicable means will be adopted to ensure that static and mobile plant will be suitably noise attenuated and maintained. Daily and weekly checks of mobile plant, including inspection of the vehicles transmission, exhaust and hydraulic systems will be carried out.

9.3.14 If site conditions dictate that ancillary diesel driven equipment be employed e.g. mobile plant, water pumps etc. the equipment will be suitably silenced to ensure that noise generated by such equipment does not give rise to an increase above the agreed permissible noise levels.

9.3.15 No mobile plant will operate using intrusive audible reversing alarms. Vehicles controlled by Quarries Regulations 1999, 'Quarries Regulations 1999 - Approved code of practice' (Health & Safety Executive. Second Edition 2013), required to operate with reversing warnings will be fitted with 'broadband' type alarms.

9.3.16 Procedure to be followed in the event of the permissible noise levels being exceeded.

9.3.17 Following a noise survey, in the event that the permissible noise levels are exceeded by operations from the site, the Company will inform the MPA and HPBC of the

occurrence and of any mitigating measures taken to reduce the impact. Any further action will be agreed between all parties.

9.3.18 However, following the noise assessment it is concluded that this is highly unlikely to happen.

9.4 Noise Conclusions

9.4.1 As part of the Noise Assessment, Vibrock, have made suggestions regarding wording of the noise related planning conditions. They are as follows:

9.4.2 Conditions 24 and 25 – These are suggested to be retained due to no significant change to government guidance relating to the setting of noise limits from mineral sites since the current planning permission granted 1998. There are minor wording amendments suggested for condition 25 as follows:

- Reference to *'Minerals Planning Guidance Note 11'* replaced with *'Planning Practice Guidance: Minerals'*
- Reference to Condition 25 replaced with Condition 24 or its equivalent within a new set of conditions.

9.4.3 Condition 27 – Noise emissions from the site are recommended to be routinely monitored in accordance with the current noise management and monitoring protocols. The monitoring locations are deemed appropriate and no new noise sensitive development has taken place closer to the site since the monitoring began, therefore no new monitoring locations are suggested. This scheme was approved in May 2017, it is suggested that this scheme remains in place in accordance with Condition 27.

9.4.4 Conditions 26 and 28 – These conditions control the noise which is emitted from the vehicles, plant and machinery on site. It is proposed that these conditions are retained.

9.4.5 Overall, it is considered that with appropriate mitigation measures, the relevant site noise limits based on PPG and the extant permission, are met. The assessment concludes that noise from the existing quarry boundaries will not cause an unacceptable impact. The objectives of NPPF, the Development Plan and other material policy considerations are met.

10 Air Quality and Dust

10.1 Policy Context

10.1.1 The Environmental Impact Assessment Directive (85/337/EEC) states that the direct and indirect effects of development should be assessed in terms of their impact on specific factors. Based on the factors identified in Article 3 of the EIA regulations, dust has the potential to impact on human beings and fauna.

10.1.2 The most relevant policies applicable to the consideration of potential impacts on air quality and dust emanating from the proposed development are as follows:

- NPPF Section 17
- The Derby and Derbyshire Minerals Local Plan (April 2000) :
  - Policy MP3 – Measures to Reduce Environmental Impact
- Planning Practice Guidance

10.1.3 The thrust of these policies is to ensure that development does not cause an unacceptable adverse impact in terms of dust and air quality. The policies seek to ensure the protection of sensitive receptors and users.

10.1.4 The potential air quality impacts of the development have been considered by Vibrock. Their assessment is attached at ES Volume 2 Technical Appendix D. A summary of the findings is provided below.

10.1.5 The Vibrock air quality assessment reviews the extant planning conditions from the Initial Review Planning Permission (Reference No.1.776.3 granted by Derbyshire County Council) to evaluate the potential air quality emissions from on-going site operations permitted up to 2042.

10.1.6 The conditions on the Initial Review permission which control air quality relate to dust. These are condition no's. 34 through 36, wording of which can be found below:

- Condition 34 - At all times all operations relevant to the winning and working of minerals at this site shall be carried out in a manner to minimise airborne dust emissions from the site.

- Condition 35 – No vehicle used for the movement of mineral, soils or overburden within the site shall be equipped with downward pointing exhaust pipes and heavy plant shall be fitted with radiator deflector fan plates so that dust displacement is kept to a minimum.
- Condition 36 - All blast hole drilling equipment used within the quarry shall be fitted with dust arrestment equipment in accordance with the manufacturer's recommendations and be so operated at all times to minimise airborne dust emissions from the site.

10.2 Consideration of Potential Impact

10.2.1 The Vibrock assessment has highlighted that there are several residential properties potentially sensitive to the impacts of dust which lie on the immediate periphery of the existing quarry. The assessment has included consideration of the potential for impact on identified nearby sensitive receptors deriving from normal operations associated with mineral extraction and short-term temporary operations such as soil stripping.

10.2.2 The impact of fugitive emissions from mineral dusts can include soiling of surfaces, physical impact on sensitive industries and facilities, physical or chemical impact on vegetation, and the 'nuisance' factor associated with dust emissions. Whilst there are no universal standard/threshold for 'nuisance' dust, a frequently used maximum associated with the mean rate of soiling dust deposition gauges is 200 milligrams per square metre per day. This is in line with published best practice for nuisance dust monitoring.

10.2.3 To understand the potential impacts of the operations on air quality, an understanding of the existing air quality is required. Two dust monitoring locations were established, one on the football pitch adjacent to the site access track and one Southwest of the quarry (shown on Figure 1 of the Air Quality Report in ES Volume 2 Technical Appendix D). Dust levels in these areas were monitored using sticky pads with analysis in effective area coverage per day.

10.2.4 The Environment Agency Technical Guidance Note (Monitoring) M17 details in section "5.3.2 Guidelines limits for soiling rates of dust fall sampled by sticky pads" details the

following sampling thresholds: None, Noticeable, Possible Complaints, Objectionable, Probable Complaints, Serious Complaints.

10.2.5 Results on the monitoring which took place between 20/10/20 to 03/11/20 found that dust levels were just within the 'Noticeable' category. The particles present appear to be from the direction of the road traffic as opposed to emanating from the quarry.

Potential Emissions

10.2.6 The following operations involved in the extraction and movement of aggregate, overburden and quarry waste have the potential to generate dust emissions.

Mineral Extraction and Transportation Operations

10.2.7 The majority of mineral being extracted on site will contain low moisture content. Dust suppression measures detailed within the mitigation chapter and ES volume 2 Technical Appendix D will be implemented to reduce potential for dust emission from the site.

10.2.8 The drop height between the excavator bucket to the Articulated Dump Truck (ADT), and the ADT to the mobile crush feeder will be minimised. The on-site speed limit of 30mph will continue to be enforced and the use of a water bowser will minimise dust emissions from the operation.

10.2.9 Internal haul roads of compacted limestone material will continue to be regularly maintained to minimise dust generation.

10.2.10 Mobile plant exhausts and cooling fans will be discharged away from the ground to prevent dust mobilisation. All plant will be regularly maintained.

Mineral Processing Plant

10.2.11 Processed material is shielded from prevailing wind where possible.

10.2.12 The ground around the crushing and screening plant is hardstanding of compact aggregate. The lime kiln area is housed with a 15mph speed limit around the kiln area. Lorries leaving the site with aggregate are sheeted in line with Condition 22 of the 1998 Initial Review of Minerals Permission.

10.2.13 Lorries leaving the site also use wheel washing facilities on site and the site access road is paved in line with Conditions 19 and 21 of the 1998 Initial Review of Minerals Permission.

Potential Emission Magnitude

10.2.14 To understand the magnitude of potential emissions from the operations the sources addressed below must be considered. The Institute of Air Quality Management (IAQM) "Guidance of the Assessment of Mineral Dust Impacts for Planning, 2016" suggest magnitude of potential emissions should be classified as small, medium or large.

10.2.15 Mineral Extraction – There are no conditions controlling the maximum output of mineral from the site. It has been identified that Hindlow will likely have an output of around 2,000,000 tpa. The IAQM deem this as a medium working area, but with high extraction rates and moisture content of the material it is classed as a large potential dust emission.

10.2.16 Materials Handling Quarry Void – Mineral extraction has the potential to involve maximum of 16 plant items operational simultaneously. Some of this will take place near to site boundaries. Material handling will take place deep within the quarry, at depths of between 400 and 235mAOD, whilst boundary land will be at 400-410mAOD. Material will be handled on compacted aggregate floor with low moisture content mineral therefore handling is deemed to have a large potential dust emission.

10.2.17 Preparation and Materials Handling for the North Eastern Landform – Soils will be stripped and stored prior to using the North Eastern Landform. There is a range of heavy vehicles which shall be utilised for preparing and working the North Eastern Landform. The total figure of material to be moved in this location is 70,000m^3. Work activities associated with the North Eastern landform are therefore categorised as a medium residual dust emission.

10.2.18 On-Site Transportation Quarry Void – The haul roads are made of compacted aggregate where approximately one hundred ADT movements are made per day transporting materials to the kiln area for production and stock. Quarry haul roads have a speed control of 30mph, and the kiln area has a speed limit of 15mph. A tractor

and water bowser can be used between 3 to 4 times daily during dry windy days. On-Site transportation is deemed as having a medium potential dust emission.

10.2.19 On-Site Transportation North Eastern Landform – Across a daily 8-hour period, 250 internal vehicle movements are planned. The haul roads leading to the North Eastern Landform are to be made of compacted aggregate and will have a speed limit of 15mph applied. A tractor and water bowser will be used between 3 to 4 times daily during dry windy working conditions. On-site transportation at the North Eastern Landform is classed as having a medium potential dust emission.

10.2.20 Mineral Processing – During the busiest periods the mineral processing plant consists of four mobile crushers, four mobile screens, and four tele stackers; with a tractor and water bowser being utilised when necessary. The IAQM suggests that using a raw and end material of low moisture content, processing over 1,000,000 tpa of material with mobile plant, is deemed a large potential dust emission.

10.2.21 Stockpiles – Current stockpiles are 150m away from the site boundary, the future stockpiles are to be at least 100m away from the site boundary. They will be used daily and formed on compacted aggregate ground. The current stocking area is around 1.5ha with the future stocking in the order of 3ha, there will be other transient stockpiles around the site awaiting to be transported to the kiln or stocking area. The IAQM suggests that due to the low moisture content of material and the regular use of stockpiles are that this activity could be deemed a large potential dust emission magnitude. However, the stocking activity is small in area and far from the site boundary, therefore this activity is deemed a medium potential dust emission.

10.2.22 Off-Site Transportation – There are a total on average of around 100 HGV movements off-site. The quarry access road is 400m and constructed of asphalt. There is a wheel wash utilised and a road sweeper deployed when necessary. 100 HGV movements are classed as a medium residual source emissions magnitude by the IAQM guidance. A 400-metre paved site access road combined with vehicle cleaning facilities is classed as a small potential dust emissions magnitude. Overall offsite transportation is deemed small on the IAQM scale for residual source emissions.

Climatic Conditions

10.2.23 Effective control of the measures outlined within the mitigation section below and in ES Volume 2 Appendix 3 of Technical Appendix D will depend on climate conditions and separation distance between the dust emitting sources and the receptor locations.

10.2.24 Dust dispersal occurs on 'dry working days'. These are defined within the guidance 'The Environmental Effects of Dust from Surface Mineral Workings' published by DoE in 1995, as days with less than 0.2mm of rainfall.

10.2.25 Data provided by Weathernet from the nearest monitoring station at Leek Thorncliffe finds there are 96.4 dry days a year at Hindlow, when converted into working days this is reduced to 68 working days per year. For calculation of dry working days and wind direction please see ES Volume 2 Chapter 4 of Technical Appendix D.

10.2.26 Dust is not likely to be carried on wind less than 5.6ms^{-1} according to the Beaufort Scale. For a dust event to occur there must be a failure of dust control measures. Particles of 30µm make up the greatest proportion of dust from mineral processing.

- Particles sub 10µm – Travel up to 1km
- Particles 10-30µm – Travel 250-400m
- Particles >30µm – Travel up to 100m

10.2.27 Climatic conditions conclude that on the dry days wind will predominantly travel from the south west, giving a maximum 7 (6.8) dry windy working days as calculated from the Weathernet data.

Potential Impact to Receptors

10.2.28 Above is consideration of the dust emitting sources and the climate which shall control the severity of the issue. The information below assesses the potential impacts on the nearest receptors. The receptors are shown in ES Volume 2 Figure 1 of Technical Appendix D.

10.2.29 The tables below are categories used by the IAQM Guidance on the Assessment of Mineral Dust Impacts for Planning regarding frequency of dusty winds and receptor distance from dust source.

Table 10.1 – Categorisation of Frequency of Potentially Dusty Winds

Frequency Category	Criteria
Infrequent	The frequency of winds (>5m/s) from the direction of the dust source on dry days are less than 5%
Moderately Frequent	The frequency of winds (>5m/s) from the direction of the dust source on dry days are between 5% and 12%
Frequent	The frequency of winds (>5m/s) from the direction of the dust source on dry days are between 12% and 20%
Very Frequent	The frequency of winds (>5m/s) from the direction of the dust source on dry days are greater than 20%

Table 10.2 – Categorisation of Receptor Distance

Category	Criteria
Distant	Receptor is between 200m and 400m from dust source
Intermediate	Receptor is between 100m and 200m from dust source
Close	Receptor is less than 100m from dust source

Sterndale Moor

10.2.30 The closest approach from Sterndale Moor to site is at the access road a 50m distance. This is classified as close. Here winds travel from SSW and WSW giving a total of 6.8 dry days (10.1%) which is moderately frequent.

10.2.31 The distance between Sterndale Moor and the NE landform is 170m, an intermediate distance. Winds are from the WSW, W and WNW giving a total of 6.8 dry days (10.1%) which is moderately frequent.

10.2.32 The distance between Sterndale Moor and the nearest mineral handling operation is greater than 400m, which is in excess of the greatest distance category, therefore the IAQM deem its effectiveness as not significant. Winds are from SSW and WSW giving a total of 6.8 dry days (10.1%) which is moderately frequent.

Dowlow Farm

10.2.33 Dowlow Farm is ~720m east of Hindlow Quarry, deeming it effect of dust not significant. Winds from WNW and W totalling 3.5 (5.2%) dry days annually. This is classed as moderately frequent.

Braemar House

10.2.34 Braemar House is located south of Hindlow Quarry at a distance of ~520m from the application boundary. This is deemed not significant. Winds from the NNW, N and NNE equate to 1.2 (1.7%) dry days which is deemed infrequent.

Jericho Farm

10.2.35 Jericho Farm is ~370m south west at the closest distance which is categorised as distant. Winds are from N, NNE and ENE quadrants totalling 2.8 (4.1%) dry days annually. Wind strength to blow from the site and to transport dust is therefore considered to be infrequent.

No.2 Fiveways

10.2.36 The closest approach to the site boundary is ~960m northwest. Winds from a S and SSE direction blow from the site towards No.2 Fiveways therefore deemed not significant. A total of 3.4 (5%) dry windy days which is deemed moderately frequent.

Harley Grange

10.2.37 Harley Grange is classed as having a pathway effectiveness of not significant due to being ~625m south-west of Hindlow quarry. Wind would blow from the site towards

Harley Grange from the ESE, E and ENE quadrants, totalling 8.9 (13.2%) windy days annually which is frequent.

Dale Grange

10.2.38 Dale Grange is ~750m north of the closest point of the application boundary, therefore is deemed not significant. The wind blows from the S and SSW quadrants totalling 5.7 (8.4%) dry windy days, moderately frequent.

Pathway Effectiveness

10.2.39 A matrix is used to calculate the effectiveness of the pathways dust would travel on windy days. Sterndale Moor (to Quarry Access Road and NE Landform) is deemed 'moderately effective', Jericho Farm is 'ineffective' and the rest of the receptors ae 'not significant'.

Estimation of Dust Impact Risk and Magnitude

10.2.40 A matrix used to calculate the Dust Impact Risk at each of the receptors calculated all receptor locations as 'Negligible Risk' apart from operations on the North East Landform for Sterndale Moor and Jericho Farm which are both 'Low Risk'.

10.2.41 The magnitude of the risk is also assessed for each receptor. All those with 'Negligible Risk' are 'Negligible Effect' and those deemed 'Low Risk' are 'Slight Adverse Effect' in terms of magnitude.

PM_{10} Assessment

10.2.42 The Air Quality Strategy for England, Scotland, Wales, and Northern Ireland, 2003 suggests that quarrying and construction work are thought to account for less than 1µg/m³ of PM_{10} levels.

10.2.43 Air Quality was assessed as part of the study using DEFRA data at each of the receptor locations used above. The objective limit for PM_{10} levels in a 24-hour period is 50µg/m^3, and annually the limit is 40µg/m^3.

10.2.44 All receptors are well below the annual mean limit of 40µg/m^3, with the highest across any of the receptors being 14.10 µg/m^3 at Dowlow Farm in 2021. Each of the receptors are also <1 exceedance of 50µg/m^3 annually. Therefore, Hindlow Quarry satisfies the

UK Air Quality Objectives for PM10 of no more than 35 exceedances per year of a 24 hour mean of 50µg/m³ and an annual mean of 40µg/m³.

10.2.45 This procedure clearly indicates that the PM_{10} from Hindlow Quarry is not likely to exceed the Air Quality Objectives and it is considered that the best practice measures for dust control are appropriate and in proportion to the potential for dust emission.

10.2.46 Effects of increased $PM_{2.5}$ were also assessed, and it was determined that with continued operations at Hindlow Quarry, the annual mean concentration of PM_{10} and $PM_{2.5}$ would not exceed Air Quality Objectives.

10.2.47 Measures to control the impacts of dust and impact on air quality are outlined in the mitigation provided below.

10.3 Consideration of Potential Mitigation

10.3.1 The following best practice measures are proposed to suppress impact on air quality and dust generation from the proposed continued mineral extraction and processing at Hindlow Quarry:

- Dust Management on Plant;
- Dust Mitigation Training for Site Personnel - All site employees will receive appropriate training in order to ensure that they are conversant with the site dust control strategy;
- Haul routes to be regularly maintained by grading to minimise dust generation;
- Water to be used as required via site water bowser;
- Speed controls to be implemented on all haul routes 30mph and 15mph in the NE landform area;
- Drop heights to be minimised – This is outlined in paragraph 12.2.8;
- Evenly loading vehicles;
- Mobile plant exhausts and cooling fans to point away from ground;
- Wheel wash facilities;
- Separate paved parking area of off-site vehicles (staff cars);
- Plan activities that are particularly dusty as to avoid dry windy working days

10.3.2 In addition to the application of routine mitigation, the specific dust amelioration measures presented will be dependent on the daily management of the site. A Scheme of monitoring will be undertaken in order to record ambient weather conditions (which will be monitored continuously) and dust deposited at identified monitoring locations.

10.3.3 Monitoring will utilise frisbee-type dust deposit gauges with foam inserts and bird guards, located both within the curtilage of the quarry complex and at receptors in the vicinity of the quarry, dependent upon access and agreement from land owners. The gauges are used to be establish the mean rate of environmental dust deposition and accord with the preferred methods and practices of the EA and the Minerals Industry Research Organisation.

10.3.4 Samples will be collected on a monthly basis to establish the mean rates of dust deposition with monthly Certificates of Analysis produced, to be disseminated to the Regulatory Authorities. After an agreed monitoring period the results will be correlated with the production of a brief report, which shall review the performance of the dust mitigation and identify the need for mitigation or continuation/cessation of monitoring as appropriate.

10.3.5 Should dust deposition exceed 200 milligrams per square metre per day, the source of fugitive emissions will be identified and appropriate amelioration applied. The duration of any additional monitoring will be agreed with the MPA and if required, ambiguous dust samples will be analysed in order to apportion the source of dust.

10.4 Dust and Air Quality Conclusions

10.4.1 The Air Quality Assessment undertaken by Vibrock has concluded that it is unlikely there will be any significant decrease in local air quality as a result of continued operations Hindlow Quarry. Dust occurrence event will be limited and short duration which can be minimised by implementing dust control recommendations.

10.4.2 The potential dust sources have been assessed and identified, mitigation has been outlined as to how these sources can be minimised, and their impact on potential receptors analysed. None of the receptors will face more than a low risk / slight adverse effect.

10.4.3 Regarding air quality levels of PM_{10} and $PM_{2.5}$ are found to remain acceptable throughout the life of mineral operations at Hindlow Quarry, with no exceedance of Air Quality Objectives.

10.4.4 Overall, it is considered that the effect on air quality of this quarry with the implementation of suitable dust mitigation measures is considered not significant. The objectives of NPPF, the Development Plan and other material policy considerations are met.

11 Blasting

11.1 Policy Context

11.1.1 The Environmental Impact Assessment Directive (85/337/EEC) states that the direct and indirect effects of development should be assessed in terms of their impact on specific factors. Based on the factors identified in Article 3 of the EIA regulations, blasting has the potential to impact on human beings and fauna.

11.1.2 The development plan contains policies and text concerning the potential impact from blasting and vibration in connection with development proposals. In particular:

- NPPF Section 15 & Technical Guidance 23-37;
- The Derby and Derbyshire Minerals Local Plan (April 2000)
- Policy MP3 – Measures to Reduce Environmental Impact

11.1.3 The thrust of blasting policy is that ground vibration shall be limited in order to protect the amenity of sensitive properties as well as maintaining acceptable levels of impact on amenity, human health, and the natural and historic environment. Although not extant guidance, Mineral planning guidance, in MPS1 and MPS2, also advises on controlling the effects of development and keeping impact to a minimum.

11.1.4 The Hindlow Quarry site currently benefits from the Initial Review 1998 Planning Permission (Reference No.1.776.3 granted by Derbyshire County Council on 28th April 1998) to continue the winning and working of minerals and disposal of quarry waste until 2042. This permission contained a number of Planning Conditions controlling blasting operations, outlined below:

- Condition No.29 requires except in emergencies blasting shall not take place except between 10:00am and 4:00pm Mondays to Fridays with no blasting on Saturday, Sunday or Bank Holidays.
- Condition No.30 states that ground vibration as a result of blasting operations to not exceed a peak particle velocity of 6mm per second in 95% of all blasts measured over any period of 6 months and no individual blast shall exceed a peak particle velocity of 12mm per second as measured at vibration sensitive building. The measure shall be the maximum of three mutually perpendicular directions taken at the ground surface at any vibration sensitive building

- Condition No.31 states that there shall be no secondary blasting except with the prior agreement of the Mineral Planning Authority.
- Condition No.32 requires the operators to take steps to minimise the effects of air over pressure arising from blasting operations in accordance with a scheme which has the written approval of the Mineral Planning Authority. A scheme for this purpose shall be submitted and approved prior to commencement of blasting operations. The scheme shall have regard to blast design, methods of initiation and the weather conditions prevailing at the time shall be implemented forthwith on its approval by the Mineral Planning Authority
- Condition No. 33 requires blasting operations and the resultant vibration and air overpressure at the site to be monitored in accordance with a scheme which has the written approval of the Mineral Planning Authority. A scheme for this purpose shall be submitted prior to the commencement of blasting operations. The scheme shall include:
    a) Blast monitoring locations
    b) The monitoring equipment to be used
    c) Presentation of results to the Minerals Planning Authority

11.1.5 A Blast Management and Monitoring protocol was submitted to the MPA in May 2017 which was approved on 20th July 2017 under Condition No.32 and 33 of the 1998 Initial Review Planning Permission. This scheme is included in ES Volume 2 Technical Appendix E.

11.2 Consideration of the Potential for Impact

11.2.1 With regard to the consideration of the effects of blasting and vibration from Hindlow Quarry, Vibrock have undertaken a blasting assessment in respect of ground borne vibration and air over-pressure and this is contained in ES Volume 2 Technical Appendix E.

11.2.2 In considering the issues set out in the Development Plan and other policy documents there is a need to ensure that impacts on local communities and amenity are maintained within permissible levels. As even the most well designed and executed

blasts generate a certain amount of energy in the form of ground vibration and air overpressure, it is necessary to ensure that mineral operations do not cause unacceptable harm to sensitive receptors. The potential ground vibration and air overpressure impacts of the development have been considered by Vibrock in association with the Company.

11.2.3 There are a number of potentially sensitive residential properties which lie on the periphery of the existing quarry. Overall, it is considered that the existing approved schemes on blasting and blast monitoring provide adequate controls on the impacts of ground borne vibration and air overpressure. Levels of vibration from a production blast were monitored in November 2020. A summary of the results is set out in Table 2 of the Vibrock report in ES Volume 2 Technical Appendix E).

11.2.4 This data from the production blast has been processed to assess the maximum instantaneous charge (MIC) in order to comply with the vibration criteria of the existing planning permission of 6 mms at a 95% confidence level. It was assessed that a MIC charge weight of 270 kg could be used 235 metres from property whilst complying with the recommended vibration criteria. The closest residential properties are approximately 395 metres away at closest approach.

11.2.5 The receptors chosen for the purposes of this report are those which are the closest residential inhabited properties within the surrounding area during the various phases of operation.

11.2.6 Table 5 of the Vibrock report (ES Volume 2 Technical Appendix E) includes details of the predicted vibration levels when blasting in the mineral extraction areas and employing an instantaneous explosive charge weight of 270kg.

11.2.7 The predicted maximum vibration levels given will only occur when using an instantaneous charge weight of 270kg at the nearest distance of approach to the respective locations. As such, the vast majority of blasting events within the mineral development area will be significantly below the levels given.

11.2.8 The locations chosen for the purposes of the report are those at which are the closest inhabited residential properties closest to the phased operations.

18 Sterndale Moor

11.2.9 Utilising a maximum explosive charge weight of 270kg the worst case predicted vibration level from blasting operations at closest approach is 1.08 mms^{-1} during Phase

3, which is well within the recommended vibration criteria of 6 mms^{-1} at 95% confidence level.

Dowlow Farm

11.2.10 Utilising a maximum explosive charge weight of 270kg the worst case predicted vibration level from blasting operations at closest approach is 0.13 mms^{-1}, which is well within the recommended vibration criteria of 6 mms^{-1} at 95% confidence level.

Braemar House

11.2.11 Utilising a maximum explosive charge weight of 270kg the worst case predicted vibration level from blasting operations at closest approach is 0.37mms^{-1}, which is well within the recommended vibration criteria of 6 mms^{-1} at 95% confidence level.

Jericho Farm

11.2.12 Utilising a maximum explosive charge weight of 270kg the worst case predicted vibration level from blasting operations at closest approach is 1.85mms^{-1}, which is well within the recommended vibration criteria of 6 mms^{-1} at 95% confidence level.

Harley Grange

11.2.13 Utilising a maximum explosive charge weight of 270kg the worst case predicted vibration level from blasting operations at closest approach is 0.50mms^{-1}, which is well within the recommended vibration criteria of 6 mms^{-1} at 95% confidence level.

No.2 Fiveways

11.2.14 Utilising a maximum explosive charge weight of 270kg the worst case predicted vibration level from blasting operations at closest approach is 0.19 mms^{-1} during Phases 2 and 3, which is well within the recommended vibration criteria of 6 mms^{-1} at 95% confidence level.

Dale Grange

11.2.15 Utilising a maximum explosive charge weight of 270kg the worst case predicted vibration level from blasting operations at closest approach is 0.11 mms^{-1} during Phases 2 and 3, which is well within the recommended vibration criteria of 6 mms^{-1} at 95% confidence level.

Rail Line

11.2.16 Utilising a maximum explosive charge weight of 270kg the worst case predicted vibration level from blasting operations at closest approach is 12 mms^{-1}. Therefore, during Phase 1 and Phase 2 blasts should be designed with reference to Table 4 (see ES Volume 2 Technical Appendix E) where a reduction in charge weight would be necessary to meet the vibration criteria.

11.2.17 Experienced and suitably trained site personnel will ensure that the effects of ground borne vibration and air overpressure do not have an unacceptable impact on receptors by monitoring blasts at Hindlow Quarry and ensuring that best practice methods are undertaken.

11.2.18 Monitoring of the impacts of each blast will be undertaken at the closest receptors, where owner / occupier permission is granted, in order to assess the effects on that property. This practice is for all blasts in order to ensure compliance with permissible levels at all times. Regression analysis will be undertaken as required.

11.2.19 The upper acceptable level which ground borne vibration must not exceed is a peak particle velocity of 6 mms^{-1} (expressed at 95% confidence) and never exceed a maximum peak particle velocity of 12 mms^{-1} as measured at or near to the foundations of the closest sensitive receptors to each individual blast.

11.2.20 All relevant records pertaining to the measurement and recording of ground borne vibration and air overpressure will be retained by the Company's site management for a period of three years and will be available for inspection by authorised officers of Derbyshire County Council and High Peak Borough Council.

11.3 Consideration of Potential Mitigation

11.3.1 It is recommended that a vibration limit of 6 mms^{-1} ppv is set at residential properties which is in line with current planning conditions at Hindlow Quarry. With a sensible ground vibration limitation, the economics of safe and efficient blasting will automatically ensure that air overpressures are kept to reasonable levels.

11.3.2 The design of each blast will give due consideration to receptors outside of the site in terms of minimising ground borne vibration and air overpressure. For those on-site, visible and audible warnings will precede blasts, with an audible 'all clear' signal given following the blast.

11.3.3 Monitoring of ground borne and air overpressure may be undertaken at any occupied building, not under the control of the developer, existing outside the site boundary where the occupants or the building itself is likely to be adversely affected by an increase in vibration levels. Monitoring will be carried out at selected locations for all blasting events for the duration of the site's working life, in order to ensure that site operations remain within permissible levels.

11.3.4 With regard to any complaints, the company will instigate an immediate investigation with the MPA and HPBC being kept fully informed of such investigation and subsequent remedial action. Additionally, the person making the complaint will be informed of the investigation and any actions taken. In the event of the agreed permissible levels of ground borne vibration being exceeded by production blasting operations from the site, the Company will inform Derbyshire County Council and HPBC within 24 hours of the occurrence and of any mitigating measures proposed to reduce the impact. Any further action will be agreed between both parties.

11.4 Blasting Conclusions

11.4.1 With regard to the consideration of the effects of blasting from Hindlow Quarry for these next phases of development, Vibrock have provided a blasting assessment in respect of ground borne vibration and air over-pressure and this is contained in ES Volume 2 Technical Appendix E .

11.4.2 There are a number of potentially sensitive residential properties which lie on the periphery of the existing quarry. Overall, it is considered that the proposed measures to control the impacts of ground borne vibration and air overpressure will provide adequate mitigation. The production blast carried out last year, which was monitored by site personnel has been found to be in accordance with the vibration limits specified in the Initial Review Planning Permission.

11.4.3 Vibrock recommends the continuing use of the current site vibration criterion of 6 mms^{-1} for 95% of events as a satisfactory magnitude for vibration from blasting at Hindlow Quarry.

11.4.4 All blasts at Hindlow shall be designed in order to comply to a vibration criterion of 6 mms^{-1} peak particle velocity at a 95% confidence level as measured in any of the three planes of measurement.

11.4.5 With such low ground vibration levels accompanying air overpressure would also be very low and hence safe level, although it could be possibly perceptible on occasions at the closest of properties.

11.4.6 When working within Phases 1 and 2 a reduction in charge would be required at the closest approach to rail infrastructure, in line with Table 4 found in ES Volume 2 Technical Appendix E .

11.4.7 It is concluded that if the above mitigation measures are adopted, that the proposed next phase of development could be carried out in accordance with the current limits set out on the existing Initial Review Planning Permission and that there will be no unacceptable effects as a consequence of ground vibration attributable to quarry blasting.

12 Archaeology and Cultural Heritage

12.1 Planning Context

Introduction

12.1.1 This chapter provides an assessment of the impacts upon the cultural heritage resource which are predicted to result from continuation of quarrying at Hindlow Quarry up to 2042 and beyond, and constitutes the required Review of Old Mineral Permissions (ROMP) in accordance with the terms of the Environment Act 1995. This requires that quarry operators make an application for a periodic review and, if necessary, update of planning conditions no later than 15 years after the grant of planning permissions or the approval of a previous ROMP.

12.1.2 'Hindlow Lime Works' and its associated quarry had been established at the site by 1898, and the single planning permission for the quarry (CHA/1156/23) was granted in 1957. The first periodic review was undertaken in 1998, and the quarry is currently operating under conditions imposed by that review. However, quarrying activity was suspended in 1988, although the processing plant at the quarry continued to be operational, processing on-site stockpiles of material as well as material imported onto the site from Tunstead Quarry. It is now proposed to recommence quarrying operations in five phases, Phases 1 to 3 (up to 2042) being the subject of this periodic review.

12.1.3 This chapter should be read in tandem with the Desk Based Assessment, Heritage Statement and Geophysical Survey reports which form Technical Appendices (ES Volume 2 Technical Appendix F).

National Planning Policy and Guidance

12.1.4 The key policies affecting how heritage assets should be treated within the planning process is given in the *National Planning Policy Framework* (*NPPF*) paras 184-202 (MHCLG 2019). This document is supported by the *Planning Practice Guidance: Conserving and enhancing the Historic Environment* (MHCLG 2019) and *Mineral Extraction and Archaeology: Historic England Advice Note 13* (Historic England 2020). The paragraphs of the *NPPF* most relevant to this application are set out detail Appendix F1.

Local Planning Policy

12.1.5 Local planning policy relevant to the application comprises the following:

- *Derby and Derbyshire Minerals Local Plan* (adopted 2000 and amended in 2002) - Policy MP7: Archaeology - Mitigation Measures
- The emerging new *Derby and Derbyshire Minerals Local Plan* - Policy DM 6: Historic Heritage (buildings, archaeology, conservation)
- *High Peak Local Plan 2016* - Policy EQ 7: Built and Historic Environment
- *Peak District National Park Authority Local Framework Development Core Strategy* – Policy L3: Cultural heritage assets of archaeological, architectural, artistic or historic significance

12.1.6 Further information detailing these local planning policies is provided in ES Volume 2 Technical Appendix F1.

12.2 Consideration of Impact

Method Statement

12.2.1 Full details regarding the methodology used in this ES chapter for assessing the impacts to the cultural heritage resource is provided in (ES Volume 2 Technical Appendix F2), which sets out how the methodology detailed in the *Design Manual for Roads and Bridges* (DfT 2007) has been adapted and used in this assessment.

12.2.2 Full details regarding the identification and assessment of on-site heritage assets is provided in the *Historic Environment Desk Based Assessment* (Brown 2021) which is included in (ES Volume 2 Technical Appendix F3), and the detailed assessment of potential impacts to designated heritage assets in the wider landscape is provided in the *Heritage Statement* (ES Volume 2 Technical Appendix F4). This Appendix also provides details regarding the methodology used for assessment these assets taken from *Historic Environment Good Practice Advice in Planning: 3: The Setting of Heritage Assets* (Historic England 2019). ES Volume 2 Technical Appendix F5 also contains the *Report on a Geophysical Survey* (Durkin 2021) which provides further details of the on-site evaluation undertaken to inform the ROMP.

Archaeological Remains

12.2.3 The *Historic Environment Desk-Based Assessment* ((ES Volume 2 Technical Appendix F3)) identified that the ROMP Application Site contains 19 known archaeological remains or findspots recorded as separate entries on the Derbyshire Historic Environment Record (HER) and/or Historic England's National Record of the Historic Environment (NRHE). These are listed in Table 12.1 below, and further details can be found in Table 3 in the DBA ((ES Volume 2 Technical Appendix F3)). The locations of these sites are depicted on Figure 3 (HER entries) and Figure 9 (NRHE entries) of the DBA.

Table 12.1: Archaeological remains and findspots within the ROMP Application Site

HER ID	NRHE ID	Name
MDR83	305849	Dow Low, Round Barrow (site of), Hartington Upper Quarter
MDR85	N/A	Flint and stone implements, Brierlow Grange, Hartington Upper Quarter
MDR107	N/A	Stone Axe, Brier Low, Hartington Upper Quarter
MDR113	305859	Round barrow (lost) (1 in group of 3), Earl Sterndale, Hartington Middle Quarter
MDR114	305859	Anglian round barrow (lost, approximate site of) (2 in group of 3), Earl Sterndale, Hartington Middle Quarter
MDR115	305859	Round barrow (lost, approximate site of) (3 in group of 3), Earl Sterndale, Hartington Middle Quarter
MDR148	N/A	Bronze Flat Axe & hammerstones, Hindlow Quarry, Hartington Upper Quarter
MDR7889	30398	The Cromford & High Peak Railway - general record
MDR9322	N/A	Turning triangle, nr. Hindlow Quarry; Cromford & High Peak Railway
MDR9325	N/A	Embankment, original trackbed, nr. Hindlow Quarry; Cromford & High Peak Railway
MDR9326	N/A	Embankment, original trackbed, nr. Hindlow Quarry; Cromford & High Peak Railway
MDR9328	N/A	Embankment, original trackbed, nr. Hindlow Quarry; Cromford & High Peak Railway
MDR9330	N/A	Cutting, original trackbed, nr. Brierlow Grange; Cromford & High Peak Railway
MDR21642	N/A	Brierlow Grange (Brierlow), demolished farmstead

HER ID	NRHE ID	Name
MDR21643	1502026	Site of Limekiln southeast of Brierlow Grange
MDR21644	N/A	Site of Sheepfold south-southwest of Brierlow Grange
N/A	305903	A Neolithic stone axe of petrological Group XX findspot at Brierlow Grange Farm
N/A	1501968	A number of post medieval lime kilns with associated limestone quarries and extractive pits
N/A	1501976	Post medieval limestone quarries, a potential lime kiln and extractive pits

12.2.4 Of these known archaeological remains, the prehistoric and Anglian barrows (HER MDR83; MDR113; MDR114; MDR115) have all been lost and/or destroyed by quarrying, and the findspots of prehistoric artefacts (HER MDR85; MDR107; MDR 1048/NRHE 305903) have not been precisely located in the landscape; moreover, the artefacts are no longer present (notwithstanding the fact that more such artefacts or associated archaeological remains might await discovery). Consequently it is considered that the magnitude of change resulting from the development proposals at these sites would be *No change* and impacts would therefore be ***Neutral,*** and therefore they will not be discussed further.

12.2.5 A number of the HER entries (MDR7889; MDR9322; MDR9325; MDR9326; MDR9328 and MDR9330) are all surviving elements of the Cromford and High Peak Railway (C&HPR), and therefore, as a matter of expediency, can be treated as a single unit for the purposes of this assessment.

12.2.6 In addition to the above, the map regression and rapid walkover survey undertaken to inform the DBA identified 22 features, which are listed in Table 4 and illustrated on Figure 11 within the DBA ((ES Volume 2 Technical Appendix F3). A number of these features are associated with those sites listed in Table 1 above. For example, four dew ponds were identified (ARS1; ARS5; ARS8 and ARS15), one of which (ARS8) is associated with the Brierlow Grange Farm complex (HER MDR21642), as are the two demolished farm buildings (ARS7 and ARS9).

12.2.7 Similarly, three quarries were identified (ARS6; ARS11 and ARS12), one which (ARS6) comprises the southern extent of a wider area of post-medieval quarrying identified

from air photographs (NRHE 1501976), and a second (ARS11) is the quarry associated with the limekiln to the south of Brierlow Grange (MDR21643).

12.2.8 The second limekiln identified within the Application Site (ARS4) is part of a wider area of 'post-medieval lime kilns with associated limestone quarries and extractive pits' identified from air photographs (NRHE 1501968). This area also includes two features (ARS2 and ARS3) which are thought to relate to lead mining rather than limestone quarrying activity.

12.2.9 The remaining 10 features (ARS10; ARS13-14 and ARS16-22) are all considered to be likely post-medieval or modern small-scale clay pits or stone delves of negligible archaeological significance, although the possibility that they are of greater significance cannot be discounted.

12.2.10 Further archaeological potential has been identified as a result of the geophysical survey undertaken to inform this assessment (to be included as Appendix F4). The survey identified numerous anomalies, including what are considered to be likely natural fissures, as well as features thought to represent lead mining activity. The survey also identified what appears to be a field system and trackway in the eastern part of the Application Site. This is undated, but could potentially be of Iron Age/Romano-British date.

12.2.11 In addition to the potential direct on–site impacts to archaeological remains identified in the DBA (Appendix F3) and the geophysical survey (Appendix F5), the Heritage Statement (Appendix F4) identified a number of indirect impacts to the settings of Scheduled Monument within the wider surrounding landscape. It was concluded that the proposed Phases 1 to 3 would have a *Slight Adverse* industrialising effect upon eight Scheduled Monuments within the 5km study area (bowl barrows at Fox Low, Pilsbury, Hollins Hill, Coatestown and Cronkston Low; two cairns at Gospel Hillocks; and Anglian *hlaews* at Haslin House). At the Coatestown bowl barrow, the effects would become *Slight beneficial* during the course of Phases 1 and 2 due to the removal of part of Siberia Tip, and this would also lessen the magnitude of the impact at Fox Low bowl barrow. There would also be *Slight Adverse* impacts to three Scheduled Monuments beyond the study area to the south east (Arbor Low Henge, Bowl barrow east of Arbor Low and Benty Grange *hlaew).* At three Scheduled Monuments (Chelmorton Low bowl barrows, Five Wells chambered tomb and Fox Hole cave) there would be *Moderate Adverse* effects, which would reduce

to *Slight Adverse* as the scheme progresses due to the removal of part of Siberia Tip and the grassing-over of the proposed North-Eastern Landform. There would be *Substantial Adverse* effects at Nether Low bowl barrow, which would reduce to *Moderate Adverse* as the scheme progresses.

12.2.12 Full details of the impact assessments for archaeological remains are provided in the Archaeological Assets Summary Assessment Matrix (Table 12.4).

The Historic Built Environment

The DBA (ES Volume 2 Technical Appendix F3) identified that the ROMP Application Site contains nine known elements of the historic built environment recorded as separate entries on the Derbyshire HER and/or Historic England's NRHE. These are listed in Table 12.2 below, and further details can be found in Table 5 in the DBA. The locations of these sites are depicted on Figure 4 (HER entries) and Figure 9 (NRHE entries) of the DBA.

Table 12.2: Archaeological remains and findspots within the ROMP Application Site

HER ID	NRHE ID	Name
MDR9321	N/A	Hindlow Tunnel, nr. Brierlow Grange; C&HPR
MDR9323	N/A	Boundary wall, original trackbed, nr. Hindlow Quarry; C&HPR
MDR9324	N/A	Boundary wall, nr. Hindlow Quarry; C&HPR
MDR9327	N/A	Boundary wall, original trackbed, nr. Hindlow Quarry; C&HPR
MDR9329	N/A	Accommodation bridge, nr. Brierlow Grange; C&HPR
MDR9339	N/A	Mineral railway, Dowlow Farm to Hillhead Farm; C&HPR
N/A	1501992	A 20th Century limestone quarry, Hindlow Quarry
N/A	1501996	A 20th Century limestone quarry, Brierlow Quarry
N/A	1502663	Downlow Works limestone quarry

12.2.13 Of these built heritage assets, two (HER MDR9321 and MDR9339) are associated with the active mineral railway associated with the Application Site, and another (NRHE 15019992) comprises the actual active Hindlow Quarry itself. In addition, the adjacent active quarries of Brierlow and Dowlow are also recorded as extending into the Application Site, although in actuality this is not the case. It is considered that as these elements of the built environment would continue as an active quarry and mineral railway as a result of the development proposals, the magnitude of change

would be *No change* and impacts would therefore be ***Neutral***, and therefore they will not be discussed further.

12.2.14 The remaining built heritage within the Application Site comprises upstanding elements associated with the disused section of the former C&HPR, including three boundary walls (HER MDR9323; MDR9324 and MDR9327) and the accommodation bridge beneath the embankment (HER MDR 9329). It should also be noted that as well as the C&HPR boundary walls recorded on the HER, there are numerous other upstanding field boundary walls within the Application Site, many of which were originally constructed following the 1804 Hartington Enclosure Act. These walls are shown as thick magenta lines on Figure 10 of the DBA, and further details are provided in Appendix 5 of that document.

12.2.15 In addition to the potential direct on–site impacts to the historic built environment identified in the DBA (ES Volume 2 Technical Appendix F3, the Heritage Statement ((ES Volume 2 Technical Appendix F4) identified a number of indirect impacts to the settings of Listed Buildings within the wider surrounding landscape. It was concluded that there would be ***Slight Adverse*** effects at two Grade II Listed Buildings (Greatlow Farmhouse and Grinlow Tower) and ***Moderate Adverse*** effects during the winter months at the Grade II* Listed Church of St John the Baptist in Chelmorton Conservation Area, reducing to ***Slight Adverse*** in the summer.

12.2.16 Further details of the impact assessments for elements of the historic built environment are provided in the Historic Built Environment Summary Assessment Matrix (Table 12.5).

<u>The Historic Landscape</u>

12.2.17 The DBA (Appendix F3) identified that the ROMP Application Site contains four Historic Landscape Character primary types mapped as part of the Derbyshire Historic Landscape Characterisation (HLC), as listed in Table 12.3 below, and the extents of these areas are illustrated on Figure 5 of the DBA. In addition, the PDNPA's HLC also mapped an additional HLC type (Managed Plantations/Woodland), which is also considered to be useful for this assessment.

Table 12.3: Derbyshire HLC types Located within the ROMP Application Site

HLC ID	HLC broad type	HLC primary type	Name
HDR115	Ornamental, Parkland and Recreational	Sports Fields	Sports ground, Sterndale Moor
HDR9904	Extractive	Active Stone Quarry	Hindlow Quarry and Dowlow Works, Hartington Upper Quarter
HDR9906	Fields and Enclosed Land	Planned Enclosure	Fields near Sterndale Moor
HDR9908	Fields and Enclosed Land	Small Regular Fields	Fields west of Sterndale Moor, Hartington Upper Quarter

12.2.18 In addition to the 'broad brush' HLC described above, the DBA also included a more 'fine grained' historic landscape analysis which identified 48 Historic Landscape Parcels (HLPs) within the Application Site, as detailed in DBA Appendix 4.

12.2.19 As the historic character of one of these HLC types (HDR9904 – Extractive/Active Stone Quarry) would remain the same, the magnitude of change would be *No change* and impacts would therefore be ***Neutral.*** Further details of the impact assessment for the other elements of the historic landscape is provided in the Historic Landscape Summary Assessment Matrix (Table 12.6) and details of the wider landscape effects are provided in the LVIA (Chapter 8).

Cumulative Impacts

12.2.20 Hindlow Quarry is located in a *c.*6km long enclave of active and historic quarries which stretch for some 6km to the south-west of Buxton, including Dowlow (to the south-west of Hindlow Quarry) and Brierlow, Hillhead, and Buxton Quarries to the north-east, all of which are surrounded by the Peak District National Park. Consequently, there will evidently be a cumulative effect upon the surrounding landscape as a result of the combined industrialising effect that these will have.

12.2.21 The active quarries either side of Hindlow (Dowlow and Brierlow) both have permissions which will last until 2042, which is the timescale of the ROMP under consideration here for Hindlow Quarry. With regard to buried archaeological remains, both Dowlow and Brierlow have archaeological mitigation strategies in place, which will allow for the identification and recording of any such remains that might be discovered during the course of future quarrying. However, there is likely to be a cumulative effect due to the attrition of the archaeological resource thus identified.

The significance of this cumulative effect is difficult to gauge, as the full extent of archaeological remains affected at each of the quarries will only be apparent following topsoil stripping.

12.2.22 There will be a continued cumulative visual effect upon the settings of nearby heritage assets from the cluster of three active quarries until 2042, but this will be subsequently reduced in magnitude should any of the three quarries cease extraction and move on to the afteruse phase and restoration.

12.3 Mitigation Measures

12.3.1 Full details of the proposed mitigation measures are provided, where appropriate, in the Summary Assessment Matrices provided below in Tables 12.4, 12.5 and 12.6. In summary, these include:

- Before each phase of soil stripping, a detailed walkover survey should be undertaken, to include landscape survey to Historic England Level 2 standard. This will provide a photographic record of all historic landscape elements that would be affected, such as field boundary walls and archaeological earthworks, and a drawn record including plans at an appropriate scale. This should be scalable to a Level 3 survey should features of more significance warrant this.

- Earthworks associated with the regionally important C&HPR and the two limekilns will also be surveyed to Historic England Level 3 standard, and the survey results will inform the scope of any further investigation and/or mitigation (e.g. strip, map and sample excavation) that might be required.

- Ahead of Phase 3, a Historic Building Recording to Historic England Level 3 standard will be undertaken at the accommodation bridge which forms part of the embankment of the C&HPR.

- A scalable archaeological watching brief across the site, i.e. archaeological supervision, monitoring and recording of topsoil scaled up to a strip, map and sample excavation in any areas where archaeological remains are encountered and scaled down to intermittent supervision and monitoring in areas where there are no archaeological remains will be undertaken during each phase of soil stripping.

12.4 Archaeological Conclusions

12.4.1 Hindlow Quarry is currently operating under conditions imposed by the first (1998) periodic review, of the original 1957 Planning Permission. Condition 43 of this review addressed archaeology and stipulated:

'*The developer shall make arrangements for archaeological observation and recording during the development of the remaining undisturbed areas of the site. Details of those arrangements shall be submitted for the approval in writing of the Mineral Planning Authority at least three months before any works commence on those areas'.*

12.4.2 It is recommended that this should be replaced with an updated planning condition:

' No operations on undisturbed areas of the site shall take place until a Written Scheme of Investigation for archaeological work has been submitted to and approved by the local planning authority in writing. The scheme shall include an assessment of significance and research questions; and

1. The programme and methodology of site investigation and recording

2. The programme for post investigation assessment

3. Provision to be made for analysis of the site investigation and recording

4. Provision to be made for publication and dissemination of the analysis and records of the site investigation

5. Provision to be made for archive deposition of the analysis and records of the site investigation

6. Nomination of a competent person or persons/organization to undertake the works set out within the Written Scheme of Investigation

No development shall take place other than in accordance with the archaeological Written Scheme of Investigation.

Within a period of twelve weeks from completion of the archaeological investigation on site, the post investigation assessment shall be completed in accordance with the programme set out in the approved archaeological Written Scheme of Investigation and the provision to be made for analysis, publication and dissemination of results and archive deposition shall be secured.

Reason: To ensure that any archaeology removed or destroyed by the development is

properly recorded and archived.'

Table 12.4: Archaeological Assets Summary Assessment Matrix.

Heritage receptors	Description of impact	Value of asset				Magnitude of Impact	Nature	Significance of effects	Proposed mitigation measures
		H	M	L	N				
C&HPR earthworks (MDR7889; MDR9322; MDR9325; MDR9326; MDR9328 and MDR9330)	Burial of elements of MDR9325, MDR9338 and MDR9328 beneath soil bund during Phase 1. Destruction of MDR9322 and elements of MDR9325 and MDR9326 during Phase 2 quarrying. Burial and/or destruction of elements of MDR9328 and MDR9330, MDR9338 during Phase 3 creation of NE Landform.		*			Major adverse	Lt, Ir	Moderate/Substantial Adverse	A level 3 landscape survey to be undertaken following initial vegetation clearance. This can identify the level of any further investigation and/or mitigation that might be required.
Site of Brierlow Grange farmstead (MDR21642) including former dew pond (ARS8) and demolished outbuildings (ARS9 and ARS10)	Destruction and/or burial during expansion of NE Landform during Phase 2.			*		Major adverse	Lt, Ir	Slight/moderate adverse	A Level 2 landscape survey undertaken ahead of Phase 2 to record any visible earthworks, boundary walls etc. Watching brief (WB) scalable to a strip, map and sample (SMS) excavation during soil stripping.
Limekiln SE of Brierlow Grange (MDR21643) and associated Quarry (ARS11)	Destruction of archaeological remains during site clearance, soil stripping and the creation of the North-eastern Landform during Phase 1.			*		Major adverse	Lt, Ir	Slight/moderate adverse	A level 3 landscape survey to be undertaken ahead of the creation of the NE Landform during Phase 1. This can identify the level of any further investigation and/or mitigation that might be required ahead of or during the creation of the Landform.

Site of Sheepfold SSW of Brierlow Grange (MDR21644)	Burial and/or destruction during expansion of NE Landform during Phase 3.				*	Major adverse	Lt, Ir	Slight adverse	WB scalable to SMS during Phase 3 would enable the identification and recording of any features that might be present
Post medieval limestone quarries extractive pits (Part of NRHE 1501968) and possible lead mining open cuts (ARS2 and ARS3)	Destruction during Phase 1 and Phase 2 quarrying.			*		Major adverse	Lt, Ir	Slight/moderate adverse	Level 2 earthwork survey ahead of each quarrying phase to record any visible earthwork remains. SMS of any significant features identified during earthwork survey. WB scalable to SMS during topsoil stripping for each phase.
Post-medieval limekiln and associated quarry ARS4 (part of NRHE 1501968)	Burial and/or destruction during expansion of NE Landform during Phase 3.			*		Major adverse	Lt, Ir	Slight/moderate adverse	A level 3 landscape survey to be undertaken following initial vegetation clearance ahead of Phase 3. This can identify the level of any further investigation and/or mitigation that might be required.
Post-medieval limestone quarry ARS6 (part of NRHE 1501976)	Burial and/or destruction during soil bund creation (Phase 1) and/or expansion of NE Landform (Phase 3).			*	*	Major adverse	Lt, Ir	Slight adverse	Level 2 earthwork survey ahead of each quarrying phase to record any visible earthwork remains.
Any other earthwork remains (e.g. ARS1; ARS5; ARS10; ARS13-22 and any other that might be identified)	Destruction of archaeological remains during Phases 1-3 due to site clearance, soils stripping, creation of bunds/NE Landform, extraction.		?	?	?	Major adverse	Lt, Ir	Uncertain but likely to range from slight adverse to moderate adverse	Level 2 landscape survey (scalable to Level 3) to be undertaken in all areas ahead of each phase of working.

Previously unknown archaeological remains that might be present within the Application Site	Destruction of archaeological remains during Phases 1-3 due to site clearance, soils stripping, creation of bunds/NE Landform, extraction.	?	?	?	?	Major adverse	Lt, Ir	Uncertain but likely to range from slight adverse to moderate adverse	Watching brief (WB) scalable to a strip, map and sample (SMS) excavation during soil stripping.
Fox Low bowl barrow (NHLE 1008921) Two *hlaews* at Haslin House (NHLE 1009098) Hollins Hill bowl barrow (NHLE 1009571) Arbor Low henge (NHLE 1011087) Bowl barrow E of Arbor Low (NHLE 1011089) Two cairns at Gospel Hillocks (NHLE 1012481 & 1012595) Cronkston Low (NHLE 1017540)	Industrialising effect of predicted visual impact during Phases 1-3.	*				Minor adverse, (reducing to Negligible adverse once the NE Landform is established and grassed over from the barrows at Fox Low, Haslin House, and Gospel Hillocks)	Lt, R	Slight adverse	Mitigation built in to the design includes the screening effect of the NE Landform once this has been established and grassed over, and the reduction in size of the extant tips will also reduce visibility of the quarry operations from many assets.
Chelmorton Low bowl barrows (NHLE 1008932) Five Wells chambered tomb (NHLE 1008940) Fox Hole Cave (NHLE 1011922)	Industrialising effect of predicted visual impact during Phases 1-3.	*				Minor adverse	Lt, R	Moderate adverse (reducing to slight adverse once the NE Landform is established and grassed over at Chelmorton Low and Five Wells and after the reduction of the SE & E tips at Fox Hole Cave)	Mitigation built in to the design includes the screening effect of the NE Landform once this has been established and grassed over, and the reduction in size of the extant tips will also reduce visibility of the quarry operations.

Nether low bowl barrow (NHLE	Industrialising effect of predicted visual impact during Phases 1-3.	*				Moderate adverse	Lt, R	Substantial adverse (reducing to moderate adverse once the NE Landform is established and grassed over)	Mitigation built in to the design includes the screening effect of the NE Landform once this has been established and grassed over
Pilsbury bowl barrows (NHLE 1009166)	Industrialising effect of predicted visual impact during Phases 1-3.	*				Negligible adverse	Lt, R	Slight adverse	None
Coatestown bowl barrow (NHLE 1011862)	Industrialising effect of predicted visual impact during Phases 1-2. Removal of industrialising effect during Phase 3.	*				Negligible adverse (Phases 1-2) Negligible beneficial (Phase 3)	Mt, R	Slight adverse (Phases 1-2) Slight beneficial (phase 3)	Mitigation built into the design includes the reduction of Siberia Tip
Impact to the setting of Greatlow Farmhouse Listed Building due to the extant quarry	Visual and noise impact to the setting of Greatlow Farmhouse Grade II Listed Building.		*			Minor adverse	Lt, R	Slight Adverse	The extant quarry is currently largely screened from view by the grassed over artificial landform to the north of the quarry void.
Changes to historic landscape character	The proposed lateral extension would result in the change of a single HLC parcel that is currently of the *Planned Enclosure* HLC type into the *Active Stone Quarry type.* The character of the extant quarry would remain extant quarry would remain unchanged, as the *Active Stone Quarry* type.		*			Minor Adverse	Mt, R	Slight Adverse	Restoration to original ground levels and to pasture after *c.*10 years

Key H = High M = Medium L = Low N = Negligible St = Short term Mt = Medium term Lt = Long term R = Reversible Ir = Irreversible

Table 12.5: Built Heritage Assets Summary Assessment Matrix.

Heritage receptors	Description of impact	Value of asset				Magnitude of Impact	Nature	Significance of effects	Proposed mitigation measures
		H	M	L	N				
C&HPR boundary walls (MDR9323; MDR9324 and MDR9327)	Burial of elements of MDR9324 and MDR9327 beneath soil bund during Phase 1. Destruction of MDR9323 and elements of MDR9324 and MDR9327 during Phase 2 Quarrying. Burial and/or destruction of remaining elements of MDR9324 and MDR9327 during expansion of NE Landform during Phase 3.		*			Major adverse	Lt, Ir	Moderate Adverse	A level 3 landscape survey to be undertaken following initial vegetation clearance ahead of Phase 1 which will include a plan and photographic record of the boundary walls.
C&HPR accommodation bridge (MDR 9329)	Burial and/or destruction during expansion of NE Landform during Phase 3.			*		Major adverse	Lt, Ir	Slight/moderate adverse	A level 3 building recording undertaken ahead of the expansion of the NE Landform during Phase 3.
Other field walls within the Application Site	Destruction during Phases 1-3 during to site clearance.			*		Major adverse	Lt, Ir	Slight adverse	Level 2 landscape survey (scalable to Level 3) to be undertaken in all areas ahead of each phase of working would include plans and photographic survey of field boundary walls including field furniture such as sheep creeps and troughs, should they be present .
Church of St. John the Baptist (NHLE 1109264), Chelmorton	Industrialising effect of predicted visual impact during Phases 1-3.	*				Minor adverse	Lt, R	Moderate adverse (during the winter) Slight adverse	None.

Conservation Area								(during the summer)	
Grinlow Tower (NHLE 1259254)	Industrialising effect of predicted visual impact during Phases 1-3.		*			Negligible adverse	Lt, R.	Slight adverse	None.
Greatlow Farmhouse (NHLE 1334882)	Industrialising effect of predicted visual and noise impacts during Phases 1-3.		*			Minor adverse	Lt, R	Slight Adverse	None.

Key H = High M = Medium L = Low N = Negligible St = Short term Mt = Medium term Lt = Long term R = Reversible Ir = Irreversible

Table 12.6: Historic Landscape Summary Assessment Matrix.

Heritage receptors	Description of impact	Value of asset				Magnitude of Impact	Nature	Significance of effects	Proposed mitigation measures
		H	M	L	N				
HDR115 (Ornamental, Parkland and Recreational: Sport Fields	No direct impacts Visual impacts increasing in magnitude as the NE Landform is created.			*		Major adverse	Mt, R	Slight/Moderate adverse	Significance of effects will reduce from moderate to slight adverse as the NE Landform becomes established and grassed over.
HDR9904 (Extractive: Active Stone Quarry)	No change of historic character, but HLC parcel will increase in size throughout Phases 1-3.			*		No change	Lt, R	Neutral	Eventual restoration, but beyond the timescale of this assessment.
HDR9906 (Fields and Enclosed Land: Planned Enclosure)	Partial loss <10%) of HLC parcel during Phase 1 Visual impacts increasing in magnitude as the NE Landform is created.			*		Major adverse		Slight/moderate adverse	Significance of effects will reduce from moderate to slight adverse as the NE Landform becomes established and grassed over.

Table 12.6: Historic Landscape Summary Assessment Matrix.

Heritage receptors	Description of impact	Value of asset				Magnitude of Impact	Nature	Significance of effects	Proposed mitigation measures
		H	M	L	N				
HDR9908 (Fields and Enclosed Land: Small Regular Fields)	Loss of majority (c.75%) of HLC parcel by Phase 3 through extraction and the creation of the NE Landform.			*		Major adverse		Slight/moderate adverse	Significance of effects will reduce from moderate to slight adverse as the NE Landform becomes established and grassed over.

Key H = High M = Medium L = Low N = Negligible St = Short term Mt = Medium term Lt = Long term R = Reversible Ir = Irreversible

13 The Impact on Water Resources and Flood Risk

13.1 Policy Context

13.1.1 The Environmental Impact Assessment Directive (85/337/EEC) states that the direct and indirect effects of development should be assessed in terms of their impact on specific factors. Based on the factors identified in Article 3 of the EIA regulations, the direct and indirect effects of the proposal on the water environment and flood risk need to be assessed. In addition, the interaction that the impact upon the water environment may have upon human beings, flora and fauna will also need to be assessed.

13.1.2 The development plans contain policies and text concerning the water environment in connection with development proposals. The main policy within the development plan relating to the potential impact of the development on the water environment is:

- NPPF paragraphs 149, 157, 158 and Section 17
- NPPF Technical Guidance on flood risk
- The Derby and Derbyshire Minerals Local Plan (April 2000) and emerging New Minerals Local Plan:
    - Policy MP4 – Interests of Acknowledged Environmental Importance
    - Policy DM7 – Water Management and Flooding

13.1.3 The thrust of this policy encompasses the advice in the NPPF regarding the protection of water quality and the need to promote the sustainable management of water resources. The policy also seeks to ensure that development does not cause an unacceptable impact upon flood risk.

13.1.4 Hafren Water have been appointed by the applicant to prepare a Hydrogeological Impact Assessment (HIA) and also a Flood Risk Assessment (FRA) relating to Hindlow Quarry, specifically how the site relates to the local water environment. Both the HIA and the FRA can be found at ES Volume 2 Technical Appendix G.

13.1.5 The conditions on the Initial ROMP permission which control the water environment are 37 and 38, wording of which is below:

- Condition 37 – No foul or contaminated drainage from the site shall be discharged, whether directly or via soakaways, into groundwater or any surface waters. All foul drainage shall be contained within a sealed and watertight cesspool, fitted with a level warning device to indicate when the tank needs emptying.
- Condition 38 - Any facilities for the storage of oils, fuels or chemicals shall be sited on impervious bases and surrounded by impervious bund walls. The volume of the bunded compound shall be at least equivalent to the capacity of the tank plus 10%. If there is multiple tankage, the compound shall be at least equivalent to the capacity of the largest tank, or the combined capacity of the interconnected tanks, plus 10%. All filling points, vents, gauges, and sight glasses shall be located within the bund. The drainage of the bund shall be sealed with no discharge to any watercourse, land or strata. Associated pipework shall be located above ground and protected from accidental damage. All filling points and tank overflow pipe outlets shall be detailed to discharge downwards into the bund.

13.1.6 Other conditions on the Initial ROMP permission, which are not specific to water environment but are relevant to aspects within this Chapter are conditions 3 and 13, wording below:

- Condition 3 – Extraction of minerals from and the deposit of mineral waste at the site shall cease by 22 February 2042;
- Condition 13 – The maximum depth of working shall be 235 metres above ordnance datum.

13.1.7 The first three phasing drawings submitted with this application are up to the year 2042 and these are the consideration of this assessment.

13.2 Consideration of Potential Impact

13.2.1 The boundary for potential impacts is very large due to the nature of groundwater movement through carboniferous limestone. The area chosen was the River Dove to the SW, the River Wye to the N and E and a 10km boundary to the SE. This area is shown on Drawing 2748/HIA/01 of ES Volume 2 Technical Appendix G.

13.2.2 Hindlow is located immediately east of the surface water catchment divide of the River Wye (West) and River Dove (East). The quarry is at a high point within the landscape, situated at about 420mAOD. Levels fall to around 261mAOD down to the River Dove ~1.8km west of the quarry. To the east levels fall to the A515, the levels undulate between 340mAOD and 440mAOD.

Baseline Conditions

13.2.3 To assess the impacts of the quarry it is important to understand the baseline conditions of the quarry.

Rainfall

13.2.4 The closest rain gauge to the site is at Buxton (NGR SK 05842 73444), 5.8km NW of the site. The data is provided by the Environment Agency (EA). The average annual rainfall data for the period of 1970 to 2014 was 1314mm. The average monthly data is presented in Table 2748/HIA/03 of the HIA report in ES Volume 2 Technical Appendix G. The highest rainfall month is December at 146.6mm and the lowest is May at 80.8mm of rainfall.

Watercourses

13.2.5 The closest major watercourses are River Dove (1.3km SW) and River Wye (3.3km N). An important tributary of the River Wye is the River Lathkill 7.3m SW of the site. Due to the permeable nature of limestone bedrock and the depth of the water table, there are few minor watercourses flowing across the limestone outcrop. Two which are relatively the close to the site are:

- Unnamed watercourse rising in Deep Dale ~2km N of the site, discharging a further 2km N near Topley Pike Quarry. The watercourse is dry in summer months and part of it passes through a Culvert under the Topley Pike Silt Lagoon tip. Planning permission associated with this quarry will remove the tip and the culvert as part of restoration.
- Unnamed watercourse ~3.8km to the NW of quarry located in Brook Bottom Valley. Part of this watercourse emerges from the base of lime kiln waste deposited in the valley from the lime works at Harpur Hill.

Waterbodies

13.2.6 There are no significant natural waterbodies in the limestone. This is a consequence of the lack of any significant superficial deposits and the highly permeable nature of the limestone bedrock.

Springs, Mine Soughs and Surface Water Flows

13.2.7 There are numerous springs in the area. Most discharge along the River Wye, a smaller number along Deep Dale and the River Lathkill which are within the Wye catchment. A few springs are located within the River Dove catchment. A full list of Springs can be found in Table 2748/HIA/T2 of the HIA within ES Volume 2 Technical Appendix G.

13.2.8 There is also a list of Mine Soughs in the area and the Surface Water Flow data within Tables 2748/HIA/T3 and 2748/HIA/T4 respectively within Technical Appendix G.

Sites of Ecological and Conservation Interest

13.2.9 Table 2748/HIA/T5 lists the water specific features, habitats and species which are primary reasons for the Special Area of Conservation (SAC) designation at the Peak District nearby. Within the search area previously outlined there are 12 SSSIs wholly or partially included. A summary of these designations is provided within Table 2748/HIA/T6 of the HIA, ES Volume 2 Technical Appendix G.

13.2.10 One component of the Derbyshire Dales National Nature Reserve lies within the Lathkill Dale SSSI in the search area. There is also Ferneydale Grassland Local Nature Reserve within the search area.

Geology

13.2.11 The quarry lies close to the western boundary of the Carboniferous Limestone outcrop of the Peak District of Derbyshire. Younger rocks that once concealed the limestone have been removed by erosion and now found in the periphery of the limestone outcrop. A summary of the stratigraphic sequence is given in Table 2748/HIA/T7 in ES Volume 2 Technical Appendix G.

13.2.12 Hindlow is located on the Bee Low Limestone Formation. This is the most extensive outcrop in the vicinity of the quarry and comprises the economic mineral at the quarry. To the east of the quarry, the limestone has been intensely mineralised

13.2.13 The quarry is located in the shelf facies of the Bee Low Limestone. The bedding in the quarry void indicates a dip to the west. Some structural disturbance is visible in the NW part of the current void.

13.2.14 Eight deep mineral evaluation boreholes were drilled in 2019, some of which have been completed for the purpose of monitoring groundwater levels. Six of the boreholes were drilled as open holes with reverse circulation to improve sampling of the limestone for mineral evaluation purposes. Two boreholes, BH5 and BH6, were cored. The limestone was described as thickly bedded, medium crystalline and uniform. Thin siltstone bands were noted, described as brown to yellow-brown and very soft, and are presumed to be wayboards.

Hydrogeology

13.2.15 The limestone bedrock is classified as a Principal Aquifer by the EA and is of regional importance for potable and industrial use. It is also an important contributor to baseflow in the Rivers Wye and Lathkill. The quarry is not located within a groundwater source protection zone, the closest is 1.6 km to the northwest; nor is it located in a Drinking Water Safeguard Zone

13.2.16 The site falls partly within the Derwent-Carboniferous Limestone Waterbody and partly in the Dove-Carboniferous Limestone Waterbody. The 2019 Water Framework Directive classification of the groundwater bodies is provided in Table 2748/HIA/T8 in Technical Appendix G.

13.2.17 For the purpose of groundwater abstraction license the extraction area of Hindlow falls entirely within Alstonfield Groundwater Management Unit.

Groundwater

13.2.18 Drawing 2748/HIA/09(a) in ES Volume 2 Technical Appendix G shows groundwater level data for the nearest three Environment Agency monitoring boreholes to the site. The hydrographs associated with these boreholes show a large seasonal range in groundwater level between 38.64 and 53.83m.

13.2.19 The hydrographs from Brierlow, and Dowlow show fluctuations in groundwater levels between 70 and 58m respectively and three of the Hindlow boreholes have ranges between 51 and 66m. Hindlow BH1 is anomalous with a range elevation of only 37m. These large seasonal fluctuations are indicative of an aquifer with very low storage characteristics.

13.2.20 The groundwater levels fluctuate from 33mAOD in BH1 to 260mAOD in BH4. The hydrographs indicate that groundwater levels at Hindlow are approximately 20m above those at Brierlow and Dowlow. It is clear that groundwater flow can change dramatically as groundwater levels rise and fall.

13.2.21 There are 9 licences for groundwater abstraction within 10 km of the site boundary abstracting from the limestone bedrock. Locations are shown on Drawing 2748/13 and summary details for each abstraction on Table 2748/HIA/T9. The closest abstractions are those operated at Dowlow, Hillhead and Brierlow quarries.

13.2.22 The Environment Agency also holds records of 5 deregulated abstractions within 5 km of the site boundary. These are abstraction which abstract quantities less than 20 m3/d. Locations are shown on Drawing 2748/HIA/13 and summary details are recorded in Table 2748/HIA/T10 in ES Volume 2 Technical Appendix G.

Hydrogeological Impacts

Catchment Sensitivity

13.2.23 The quarry is located on a Principal Aquifer. It is a licenced abstraction site along with the neighbouring quarries or Brierlow, Dowlow and Hillhead.

13.2.24 The quarry is not within a groundwater source protection zone or drinking water safeguard or protection zones.

13.2.25 The internationally designated Peak Dales Special Area of Conservation (SAC) is within 5km of the quarry along with a number of nationally designated Sites of Special Scientific Interest. These designations contain water features of importance. There are also a number of large seasonal springs north of the site which discharge into the SAC, and smaller springs to the west which discharge into the Dove catchment.

13.2.26 Resultingly, the catchment sensitivity is classified as ‘High’.

Potential Impact during Mineral Extraction

13.2.27 The groundwater levels in the area are between 40 and 110m below the quarry floor (370m AOD). No dewatering will take place until a hydrogeological investigation has been completed and proposals made for sub-water table working. That work shall be used to obtain abstraction licence and discharge permit.

13.2.28 Therefore, deposit above the water table which is worked has 'insignificant' impact to groundwater levels or groundwater flow. The potential magnitude of impact is considered 'negligible' with a significance of 'minor'.

Groundwater Quality

13.2.29 There is potential for groundwater to be impacted in the unlikely event of an accidental spillage of hydrocarbons from the mobile plant or refuelling of site vehicles. The risks are mitigated in paragraph 13.3.2.

Cumulative and Other Impacts

13.2.30 There will be no risk to surface water or sites of ecological interests from continued operations at Hindlow Quarry.

13.2.31 There are currently no dewatering activities at the two adjacent active quarries (Brierlow and Dowlow). Brierlow will require a hydrogeological study being undertaken prior to working below the water table. Dowlow has an active hydrogeological investigation programme for working below the water table, however, the current situation is above the water table.

13.2.32 Whilst no dewatering is taking place at any of the quarries there are no cumulative impacts to groundwater.

Flood Risk

13.2.33 Flood risk impacts have been assessed for the potential sources – Fluvial, Pluvial (surface water run-off), Groundwater and Sewer and/or water mains leakage.

On site flood risk

13.2.34 The site is seen as 'less vulnerable' regarding flood receptors present in the sites current situation, which is representative of conditions post restoration. Also, as the site is entirely within Flood Zone 1, no fluvial flooding mitigation is required.

13.2.35 No upslope areas will lead surface run-off into the site externally. There are small areas within the site which are at risk of flooding by surface water (see Drawing 2748/FRA/03 of ES Volume 2 Technical Appendix G). To the north of the rail line these consists of ground depressions and culvert beneath the A515, to the south this overlaps with the mineral void, conditions of which will change throughout mineral extraction.

13.2.36 Following restoration, the only area for surface water to collect is north of the rail line is at a ditch alongside the playing fields and to the south of the site in the permanent lake within the quarry void. Overall surface water flooding is considered to be 'very low' and mitigation measures not required.

13.2.37 Groundwater flooding will only present an issue after Phase 2 (2035) of the mineral operations as the quarry shall have reached an elevation of 340mAOD. Water table varies between 260 and 330mAOD. During operations water accumulating on the quarry floor will be dealt with by the quarry water management system. Post restoration the lake formed within the quarry void will be at water table levels and self-controlled.

13.2.38 Groundwater flood risk to the quarry during operations and restoration is considered 'very low' and mitigation measures additional to the quarry water management system are not required

Off site flood risk

13.2.39 Receptors external to the site, within 1km, consist of: Sterndale Moor properties, Earl Sterndale village, Greatlow and Dowlow Farms, Braemar House, Jericho and Harley Grange Farm and Brierlow Bar Farm. These receptors are seen as 'more vulnerable', meaning there would-be higher severity here during flooding events. Other receptors in the vicinity such as roads, other quarries and agricultural fields are classed as 'less vulnerable'.

13.2.40 The site and surrounding area are within Flood Zone 1. The development will not pose a heightened risk regarding fluvial flooding to the surrounding area.

13.2.41 Surface water run-off has been considered. All surface water flooding potential is contained within the quarry boundary itself and therefore poses no further threat to areas and receptors surrounding the quarry. Flood risk to external receptors posed by changes in surface run-off from the site is considered 'very low' during operations and post-restoration.

13.3 Consideration of Potential Mitigation

13.3.1 The primary mitigation to manage hydrogeological risks will be the continuation of good practice to minimise pollution, together with the regulation of discharges and in the future dewatering. Key aspects are:

- All vehicles used within the quarry operations will be routinely inspected for leaks, with any required maintenance works undertaken in a designated works area with suitable spill kits available;
- Spill kits will be easily accessible in all areas of the Quarry;
- All run-off from the operational areas of the site will be directed to a suitable low point from where settlement can occur prior to discharge off-site;
- When dewatering is required at the Quarry an abstraction will be required from the Environment Agency prior to dewatering commencing. To apply for a licence an impact assessment will be required.

13.3.2 Accidental pollution of the groundwater will be mitigated as follows:

- Fuel Storage – Fuel storage tanks will comply with the relevant storage conditions and mobile fuel bowsers, when required, will be double skinned and preferably of limited capacity to limit maximum amount that could be spilt in the event of an accident.
- Refuelling – Undertaken in designated areas only with drip trays used whilst refuelling. Training will be given to personnel undertaking refuelling and all refuelling will be manual to ensure it cannot be done unattended. Spill kits present at all refuelling operations so immediate action can be taken if necessary.

13.3.3 Dewatering will only take place once a full hydrogeological study has been completed and a dewatering scheme has been agreed, with suitable mitigation measures in place, if these are required. As noted above, dewatering is expected to be required once the quarry floor is below approximately 330 mAOD, and from approximately 2035 onwards. This gives sufficient time for data to be collected to improve the understanding of the water, an appropriate scheme of monitoring is required to provide information on changes in groundwater level environment.

13.3.4 The hydrogeological investigation has been started, initially with the installation of four groundwater monitoring boreholes around the site. This will be extended to cover potential external receptors considered likely to be impacted.

Flood Risk

13.3.5 The assessed flood risk to or from is the site is generally low or negligible therefore no site-specific mitigation actions are proposed / required. This assumes implementation of a quarry water management system and working procedures to facilitate the safe operation of the quarry.

13.3.6 Restoration areas outside of the extraction area will return to agricultural and grassland use, therefore attenuation storage is not required as run-off will dissipate naturally to ground – as is currently the case.

13.3.7 Potential depths of inundation from incident rainfall are not considered to represent a risk to personnel or mobile plant. If water were to accumulate to a depth where working became unsafe then operations in the affected area would cease until water levels decreased.

Run-off and storage volume calculations

13.3.8 Run-off has been estimated for the 1 in 100-year design event with a 20% allowance for increased rainfall due to climate change. The greenfield run-off rates calculation and results can be found in ES Volume 2 Technical Appendix G .

13.4 Water Resources and Flood Risk Conclusions

Hydrogeological Impact Conclusions

13.4.1 The groundwater and surface water regime in the vicinity of Hindlow Quarry has been reviewed using data from the British Geological Survey, the Environment Agency, the Applicant and published information.

13.4.2 There are no watercourses within the immediate vicinity of the site. Major groundwater discharge from the limestone aquifer occurs along the River Wye the River Lathkill and the River Dove.

13.4.3 Groundwater monitoring boreholes were installed in July 2019. A limited amount of time series data are available from nearby quarries based on published reports, as well as from nearby Environment Agency monitoring boreholes. The boreholes have indicated that the groundwater levels vary between 330mAOD to 260mAOD, current quarry floor is at 370mAOD.

13.4.4 The groundwater flow is complex, responding to seasonal changes in rainfall. On regional scale groundwater flow is likely to discharge at the River Wye and River Lathkill and to a lesser extent, the River Dove.

13.4.5 Quarry working will remain above the water table throughout all of Phase 1 and Phase 2 (up to 2035), until then there will be no impacts to any sensitive groundwater receptors on the River Wye, River Lathkill and Dove. From Phase 3 onwards dewatering will be required

13.4.6 It is proposed that a condition is added to the existing permission to ensure no working takes place into the groundwater until a dewatering scheme has been submitted and agreed upon by the Mineral Planning Authority.

13.4.7 There are potential impacts on groundwater quality from accidental chemical or fuel spills. Mitigation measures have been proposed to ensure that in the unlikely event of a spill impacts to water quality will be negligible.

Flood Risk Conclusions

13.4.8 As the site is over 1Ha a Flood Risk Assessment was required to comply with the NPPF. The risk of flooding to the site from fluvial, groundwater, surface water and sewage / water mains is very low to negligible.

13.4.9 The changes in the land use consists of mineral extraction void south of the rail line and soil/stocking north of the rail line. Surface run-off into the mineral void will be contained by the void and infiltrate to the limestone bedrock; when working below the water table the surface run-off will be controlled by the water management system in place. The soil and mineral stocks will have a small footprint and surface run-off can be managed by swales constructed around their perimeter toe.

13.4.10 Post restoration the north of the rail will return to existing conditions. The quarry void will fill with water that shall equilibrate with the water table with enough headroom to accommodate storm level flow.

13.4.11 In light of the above, the proposed working scheme is considered to satisfy the flood risk requirements of the NPPF and associated technical guidance.

14 Transportation and Traffic

14.1 Policy Context

14.1.1 The Environmental Impact Assessment Directive (85/337/EEC) states that the direct and indirect effects of development should be assessed in terms of their impact on specific factors. Based on the factors identified in Article 3 of the EIA regulations, transportation and traffic has the potential to impact human beings, flora and fauna. The impact on air quality and climate will also need to be assessed.

14.1.2 The main policies for assessing the potential for impact upon the highway network are as follows:

- NPPF Section 9
- Minerals Planning Guidance paragraph 015
- The Derby and Derbyshire Minerals Local Plan (April 2000) and emerging New Minerals Local Plan
    - Policy MP4 – Interest of Acknowledged Environmental Importance
    - Policy MP5 - Transport
    - Policy SS1: Spatial Strategy
    - Policy SMP4: Sustainable Transport Modes
    - Policy DM3: Transport
- Derbyshire and Derby Mineral Local Plan Background Transport Paper 2017

14.1.3 The thrust of these policies encompasses the advice in NPPF and NPPG regarding the potential environmental disturbance caused by mineral associated traffic.

14.1.4 Policy at a national and local level generally aims to minimise the environmental impacts of development related transport on existing communities. With regards to transport and HGV traffic, this requires achieving good access and promoting the use of agreed routes. The key policy test is contained in NPPF which states that development should only be prevented or refused on transport grounds where the residual cumulative impacts of development are “severe”.

14.1.5 AECOM has prepared a Transport Assessment which considers the existing activities and operations at Hindlow Quarry as well as the phased operations up to 2042. The Transport Assessment is appended at ES Volume 2 Technical Appendix H.

14.2 Consideration of Potential Impact

14.2.1 The Transport Statement prepared by AECOM has considered the traffic impacts of the phased operations up to 2042.

14.2.2 The transportation of excavated and processed materials from Hindlow are unrestricted in terms of working hours which is set out in condition 23 of the Initial Review Permission, this is set to continue.

14.2.3 It is not proposed to modify the existing site access arrangements for Hindlow Quarry.

Traffic Flows

14.2.4 The Transport Assessment has considered the existing traffic flows using an automatic traffic count (ATC) recording vehicle flows and speeds on the A515 in close proximity to the site access. The survey was conducted 12th December 2020 until 18th December 2020. It should be noted that the survey was conducted outside of school holidays and when travel patterns are disrupted by the COVID-19 pandemic. A copy of the results is attached at Appendix B of ES Volume 2 Technical Appendix H.

14.2.5 The Transport Assessment identifies through the ATC assessment that vehicle flows on A515 averaged Annual Daily Traffic (AADT) at 4,569 which is lower than the 7,452-figure attained from an historic count further north at the junction with B5053. It is also considerably less than the 13,000 AADT, which Department for Transport (DfT) define as the limit a two-lane single carriageway is built to accommodate within the Design Manual for Road and Bridges (DMRB).

14.2.6 HGVs account for 27% of the total daily flow along the road. Vehicle speeds average 58.4mph south-eastbound and 57.2mph north-westbound along, at the point of access, a 50mph road.

Personal Injury Collision Data

14.2.7 Information on traffic collisions has been obtained from crashmap.co.uk. The website indicates that there have been no recorded incidents at the A515 / Hindlow Quarry site access junction within the last five-year period up to 2020. Within a 1km radius north and south of the site along the A515 there were a recorded three collisions. Two

were slight severity and one was fatal, the fatal occurring in 2015 involving only one vehicle.

14.2.8 Approximately 1.8km north of site there were a cluster of 8 accidents in proximity to the priority ghost island junction of A515 / B5053. There were no fatalities, three serious and five slight severity incidents. Three of the incidents involved a HGV, however, it is unclear if these involved HGV's associated with Hindlow Quarry. The operator is unaware of any incidents.

Trip Generation

14.2.9 The site benefits from rail and road transport. The operator provided annual rail and HGV movement associated with the site dating back to 2018 and prediction for 2021. In total, there is estimated to be a 5.9% increase in HGV movements for 2021 compared to 2019 figures (2020 figure not used due to it being an unusual year as a result of COVID-19).

14.2.10 When calculated as hourly trips related to the site there is no anticipated increase to the hourly two-way movements. In 2018 and 2019 there were an average of 5 two-way movements an hour and this is predicted to continue. This is therefore a non-material increase in HGV trips in any one hour.

14.2.11 The Guidance on Transport Assessment (GTA) indicates the starting point for assessing highway capacity is an addition of 30 two-way trips in one hour. The proposed development would generate much fewer and therefore deemed negligible.

14.2.12 The junction capacity was assessed using Junction 9 (PICADY software). A Ratios of Flow to Capacity (RFC) of 0.85 would result in requiring a new junction. The figures calculated for the current junction peaked at 0.02 therefore the junction is well within its capacity to continue to service the use at Hindlow Quarry. The full junction capacity assessment output file is provided in Appendix A of ES Volume 2 Technical Appendix H.

Traffic Routeing

14.2.13 All movements associated with the quarry are not restricted. HGV's can exit or enter left or right onto or from the A515. This routeing will remain in use for the duration of the site.

14.2.14 The overall change in traffic volumes would be minimal along the A515, therefore the development would not trigger the requirement for further environmental assessment of road traffic.

14.2.15 It is proposed to increase the number of rail exports from site to ~1400 from 130 in 2020. Data from the Guidelines to Defra / DECC's Greenhouse Gas (GHG) Conversion Factors for Company. Reporting indicated that rail freight produces only 53% of the greenhouse gas emissions of transporting materials by HGV on a per vehicle kilometre basis. This reflects the importance of having an existing rail connection at Hindlow Quarry in reducing the amount of HGV traffic on the road and allowing the sustainable transportation of product from the quarry via rail in line with Mineral Plan Policies MP5. SMP4 and DM3 as well as Minerals Planning Guidance Paragraph 015.

14.2.16 Rail has a key role in the reduction of emissions associated with mineral operations. As well as complying with the policy stated at the beginning of this chapter, rail transport will ensure Hindlow remains considerate of its pollution through the extensive timeframe the site is to be operational. On a tonne for tonne basis, rail movement produces 70% less CO2 than road, fifteen times lower NOx emission and almost 90% lower PM_{10} emission as concluded within a Sustainable Transport study conducted by the Department for Transport in 2008.

14.3 Consideration of Mitigation

14.3.1 The site currently generates HGVs on the local highway network, directly onto an approved HGV route. In 2018 and 2019 there were an average of 5 two-way movements an hour and this is predicted to continue therefore, there would be little change in overall highway performance or road safety risk.

14.3.2 The site will continue to operate using the approved access and under the existing conditions relating to highway cleanliness and HGV monitoring.

14.3.3 No significant or unacceptable negative transport impacts are anticipated and therefore additional mitigation measures are not considered necessary.

14.4 Traffic Conclusions

14.4.1 Overall, the proposals would not have a material impact on the safety or operation of the local road network. In the context of the revised NPPF paragraph 109 it can clearly be concluded that the impact of the development in terms of traffic capacity will not

be “severe”. The Transport Assessment concludes that there would be no cumulative impacts vis-à-vis other mineral options in the vicinity of the site. The site is rail connected, and therefore the environmental impacts of transporting material from the site would be minimised.

14.4.2 There are no proposals to amend any of the existing transport-related planning conditions governing the site from the 1998 Initial Review Permission.

15 Soils and Agricultural Land Classification

15.1 Policy Context

15.1.1 The complete Soils and Agricultural Report can be found in ES Volume 2 Technical Appendix I of ES Volume 2. The majority of the undisturbed site is currently in agricultural use for grazing livestock, therefore agricultural land is a receptor of potential effects arising from the Project. The sustainable management of soil and land is a central pillar in sustainable development, and consequently any effects of the application on soil resources will also be important.

15.1.2 The main policies for assessing the potential for impact upon soils and agricultural land classification are as follows:

- NPPF paragraph 170 – "Planning policies and decisions should contribute to and enhance the natural and local environment by:
    - a) ...protecting and enhancing… soils… (in a manner commensurate with their identified quality in the development plan)
    - b)...recognising the economic and other benefits of the best and most versatile agricultural land."

and under Section 17 (Facilitating the sustainable use of minerals) paragraph 205 (e) planning authorities should: "*….provide for restoration and aftercare at the earliest opportunity, to be carried out to high environmental standards, through the application of appropriate conditions….."*

- Minerals Planning Guidance (October 2014) – Section 7 (restoration and aftercare) states that applications should provide:
    - *"information about soil resources and hydrology, and how the topsoil/subsoil/overburden/soil making materials are to be handled whilst extraction is taking place".*

Appendix A includes more detailed guidance and highlights that planning applications "*should include assessment of soil resource types and quantities, soil handling and stockpiling, restoration layers and depths*" and; "*Where working is proposed on the best and most versatile agricultural land the outline strategy should show, where practicable, how the methods used in the restoration and aftercare enable the land to retain its longer term capability, though the proposed after-use need not always be for agriculture."*

- The Derby and Derbyshire Minerals Local Plan (April 2000) and emerging New

Minerals Local Plan

- Policy MP4 – Interest of Acknowledged Environmental Importance
- Policy DM4 – Landscape and Green Infrastructure

15.1.3 The thrust of these policies seeks to ensure that the proposals do not give rise to an adverse or detrimental impact on soils, land quality and agriculture.

15.2 Assessment Methodology

15.2.1 The assessment is designed to consider the effect of the Proposed Development on two receptors: agricultural land and soil resources.

15.2.2 Soil resources were reviewed by means of a desk study of published and unpublished soil maps and reports and more accurately assessed by a detailed survey across the Application Site. The detailed survey involved observations of soil and land characteristics at intersects of a 100m grid.

15.2.3 Agricultural land quality was assessed using information from the soil resources survey and other constraints to agricultural land use, such as climate, flooding and slope.

Soil Survey

15.2.4 There are no limitations associated to assessments made within this Chapter.

Significance Criteria

15.2.5 There is no nationally agreed scheme for classifying the effects of development on agriculture or soils and the approach used in this chapter has been developed over a number of years. Effects of a project can be adverse, causing significant negative effects on a receptor, beneficial, resulting in advantageous or positive effects on a receptor, or negligible.

15.2.6 Assessing the effects on soil is complicated as it is a multi-functional resource, able to support crops, habitat areas, mitigate flood risk etc. However, the main requirement in regard to mineral sites is that sufficient soil is retained of a quality capable of supporting the approved restoration scheme.

15.2.7 The magnitude of effect on Best and Most Versatile land (BMV) will depend on the amount to be taken by the development. Schedule 4 of the Town and Country Planning (Development Management Procedure) (England) Order 2015 only requires Natural England to be consulted (on behalf of the Secretary of State for the

Environment, Food and Rural Affairs) on development that involves the loss of not less than 20 ha of grades 1, 2 or 3a agricultural land. Consequently, the magnitude of losses smaller than this threshold is considered to have a small effect on the national stock of BMV land. Losses of over 80 ha of BMV land are equivalent to the size of a medium to large farm and consequently the magnitude of effect is considered to be high. The judgment-based classification is given in Table 15.1.

Table 15.1: Magnitude of Impacts

Receptor	High	Medium	Low	Negligible
Soil Resource	Loss or irreversible damage to all topsoil resources.	Loss or irreversible damage to soil such that insufficient exist for restoration	Sufficient soil resources protected to complete agreed restoration scheme	Only minor disturbance of soils within the site.
Agricultural Land	Irreversible loss of more than 80 ha of BMV land.	Irreversible loss of 20 – 80 ha of BMV land.	Irreversible loss of 5 – 20 ha of BMV land.	Irreversible loss of less than 5 ha of BMV land.

15.2.8 Permeable loamy soils are regarded as of the highest sensitivity, since these soils are of highest quality for restoration. Soils supporting valuable habitats typically have unique properties (such as low nutrient concentrations) which is vital to the support the specific ecosystem. Disturbed soils and those with high clay content and naturally poor structure are of less value for restoration and regarded as of lower sensitivity

15.2.9 Best and most versatile agricultural land (i.e. Grades 1, 2 and 3a on MAFFs 1988 Agricultural Land Classification (ALC) system) is considered to be a finite national resource, is given special consideration in national policy, and can be considered to be of higher sensitivity than land in Grades 3b, 4 and 5. In line with Welsh Government planning policy the best land (Grades 1 and 2) is considered of higher sensitivity than Subgrade 3a. The loss of lower quality land is considered of lower importance under the planning system of England and Wales.

15.2.10 The sensitivity criteria used in the assessment of effects on soils and agricultural land are summarised in Table 15.2 below; Table 15.3 combines the magnitude and sensitivity to give the overall significance of effect.

Table 15.2: Sensitivity of Receptors

	High	Medium	Low
Soil Resources	Permeable loamy soils providing a broad range of ecosystem services and/or supporting valuable habitats.	A mixture of soils, none of them supporting valuable habitats.	Slowly permeable damaged or contaminated soils providing a limited range of ecosystem services.
Agricultural Land	Grades 1 and 2	Subgrade 3a	Subgrades 3b, 4 and 5

Table 15.3: Significance of Effects

MAGNITUDE	SENSITIVITY			
	High	**Medium**	**Low**	**Negligible**
High	Major	Major	Moderate	Minor
Medium	Major	Moderate	Minor	Negligible
Low	Moderate	Minor	Minor	Negligible
Negligible	Minor	Negligible	Negligible	Negligible
N.B. major and moderate adverse effects are considered significant				

15.3 Baseline Conditions

15.3.1 The land has loamy topsoils over permeable loamy subsoils (high sensitivity receptors). None of the soils currently support valuable habitats (the land being under improved pasture).

15.3.2 The survey area comprises undisturbed land of grade 4 agricultural quality, see Table 15.4 (low sensitivity receptor). This land is limited by adverse climate.

Table 15.4: The areas occupied by each land grade

Grade/subgrade	*Area (ha)*	*% of the land*
Subgrade 4	53.0	86
Non agricultural	8.8	14
Total	61.8	100

Future Baseline or the 'Do Nothing Scenario'

15.3.3 If the site is not developed it is anticipated that there will be no change in the current baseline status.

15.4 Consideration of Potential Impact

15.4.1 Soil resources could potentially be damaged during the Working Phase of the operation. The proposed Quarry which would result in the loss of all topsoil and subsoils resources during stripping and stockpiling leaving insufficient resources available to complete the proposed restoration if the restoration was back to agricultural use. However, following the completion of extraction operations the quarry will be allowed to fill with water with limited requirement for soils. The Proposed Development therefore does not pose a large magnitude impact to a high sensitivity receptor.

15.4.2 As mineral working of the Proposed Quarry proceeds use of the agricultural land will gradually cease until all operational land is removed from agricultural use. This loss of medium magnitude and low sensitivity receptor is considered a negligible impact.

15.4.3 Soil and agricultural land loss from an individual site should be considered on a site-by-site basis (against the benefits of the scheme) and therefore it is not considered there are any relevant cumulative effects to the Proposed Development.

15.5 Consideration of Potential Mitigation

15.5.1 Mitigation for loss or damage of soil resources requires the adoption of a Soil Management Plan (see Section 4 and 5 of Technical Appendix I ES Volume 2), undertaken by a suitably qualified practitioner in accordance with the principals outlined in the MAFF (2000) Good practice guide for handling soils, which will detail:

- Identification of restoration soil requirements and assessment of suitability and availability of on-site resources;
- Depth and method of soil stripping and stockpiling;
- Means of soil protection from compaction damage and remedial measures (such as ripping/subsoiling) to remove damage;

15.5.2 The Soil Management Plan will facilitate the protection of all soil resources on site and mitigate the potential impacts of the Proposed Quarry and subsequent development to negligible.

15.6 Conclusions

15.6.1 The Proposed Quarry will have negligible effect on agricultural land resources.

15.6.2 The soil resources of the site are of Grade 4 quality and will be protected for reuse in sufficient volumes to complete all proposed restoration by adherence to the Soil Management Plan. There will be negligible impact to soil resources.

15.6.3 In terms of soil, land quality and agriculture, the proposed development will not have an unacceptable impact on human beings, flora or fauna in accordance with EIA regulations.

15.6.4 In light of the above it is considered that the objectives of NPPF and other material policy considerations are met.

16 Rights of Way

16.1 Policy Context

16.1.1 The Environmental Impact Assessment Directive (85/337/EEC) states that the direct and indirect effects of development should be assessed in terms of their impact on specific factors. Based on the factors identified in Article 3 of the EIA regulations, noise has the potential to impact human beings and fauna.

16.1.2 The most relevant policies applicable to the consideration of potential impacts of noise emanating from the proposed development are as follows:

- NPPF Section 17
- The Derby and Derbyshire Minerals Local Plan (April 2000) and emerging New Minerals Local Plan:
  - Policy MP1 (9) – Measures to reduce Environmental Impact
  - Policy DM1 – Development Management Criteria
- Planning Practice Guidance

16.1.3 A full breakdown of policies that are relevant to this planning application and ES can be found at Chapter 5. The thrust of these policies encompasses the advice in NPPF which highlights an aim, where practical, to promote safe and secure pedestrian and cycle routes. There are a number of footpaths located in close proximity to the site and these are shown on Figure J (Footpaths plan). In summary these are:

- HP14/4/1 – a footpath running along the southern boundary of Hindlow Quarry;
- HP14/8/1 – a footpath which runs from Footpath HP14/4/1 in a north easterly direction between Hindlow and Brierlow Quarries. The footpath goes over the railway line used by the quarry and continues in a north easterly direction until it joins the A 515;
- HP14/8/2 – a footpath which runs from HP14/8/1 when it emerges underneath the railway line and travels in a south easterly direction along the railway embankment before travelling in a north easterly until it joins the A515.

16.2 Consideration of Potential Impact

16.2.1 As shown on the plans accompanying the application and the routes described above there are a number of Public Rights of Way passing around or through the site. This application sets out phasing arrangements for the future working of the quarry which requires the diversion of Footpaths HP14/7/1 and HP14/8/2 during phases 1 to 3 of the operations.

Phase 1 (see Figure C – working up to 2028)

16.2.2 The Phase 1 working involves the extraction area of the quarry extending in a northerly and westerly direction towards Brierlow Quarry. The first stage will involve the removal of soils and overburden. Prior to this taking place, Footpath HP14/8/1 will be diverted and the new route will run within a wooded area alongside the boundary of Brierlow Quarry to avoid the sterilisation of mineral.

16.2.3 As footpath HP14/8/1 continues to run over the railway line to the next stage of the path (HP14/8/2) and will have to be diverted again along the boundary of Brierlow Quarry to avoid conflicting with earth moving equipment involved in the soil stripping operations; the formation of soil bunds and the creation of the north eastern landform. The diverted route is shown on Figure C. The revised route will eventually join up with the boundary of the A515. From there, the diverted path will run through the woodland belt which runs along the A515 until it reaches the point on the definitive route HP14/8/2 which meets the boundary of the A515.

16.2.4 Also, during this phase, HP14/7/1 will be stopped up for the duration of the remaining operations to avoid conflicting with earth moving equipment involved in the soil stripping operations; the formation of soil bunds and the creation of the north western landform. Users of HP14/7/1 will be able to use the diverted route of HP14/8/5 which runs along the boundary of Brierlow Quarry. Where the diverted route of HP14/8/2 runs through the woodland belt which fronts the A515 this will be extended through the woodland belt along the A515 frontage until it reaches the point on the definitive route HP14/7/1 meets along the boundary of the A515 to ensure the existing connections with WD25/12/1 and HP14/5/1 (on the opposite side of the A515) remains in place.

Phase 2 (see Figure D – working up to 2035)

16.2.5 The Phase 2 working involves the extraction area of the quarry extending in a northerly direction towards the railway embankment. This will involve the removal of soils and overburden from this area. North of the railway embankment, operations will continue with the construction of the north eastern landform and utilisation of stocking areas.

16.2.6 There will be no further changes to the routes of the diverted footpaths during this phase of operations.

Phase 3 (see Figure E – working up to 2042)

16.2.7 The Phase 3 working involves the deepening of the extraction area of the quarry. North of the railway embankment, the north eastern landform will be completed and restored. The stocking area north of the railway embankment will continue to be utilised.

16.2.8 There will be no further changes to the routes of the diverted footpaths during this phase of operations.

16.2.9 The sports playing field adjacent to the site access will remain available for use for the duration of phases 1 to 3.

16.3 Consideration of Potential Mitigation

16.3.1 The potential disturbances to the Public Rights of Way that will arise as a result of the development proposals have been considered from the outset and measures have been taken to minimise the amount of disturbance. Given that minerals can only be worked where they are found and a preference to quarry in rural areas away from sensitive receptors in population centres it is highly likely that quarrying in the countryside will be located within locations with the potential for some level of impact upon Public Rights of Way. The potential impact upon the identified footpaths from quarrying activities at Hindlow has been factored into continuing these activities and the scheme is considered to have some potential for adverse impacts upon PROW.

16.3.2 A change in the landscape of the site during operations has the potential to impact on views from the PROW in close proximity to the quarrying operations.

16.3.3 A 1.5m soil storage bund will be constructed around the perimeter of the diverted footpaths which will be grassed and planted, which will separate the diverted route

from the quarry workings and therefore restrict open views over the site from some of the PROW. The landscape and Visual Impact Chapter 7 considers the visual effects from the existing and diverted rights of ways.

16.3.4 Any visual impacts to users of the diverted route will be transient and mitigated where possible.

16.3.5 With regard to HP14/8/1 and the diverted route along the boundary of Brierlow Quarry, in order to minimise this impact, it is proposed to have a minimum 15m stand-off from the ownership boundary to the crest of the overburden strip. This stand-off will be subject to geotechnical requirements. Within the 15m stand-off boundary there will be a 1.5m high soil bund which will be seeded and grassed to assist with screening operations. Furthermore, it is proposed to erect a quarry safety fence on the operational side of the bund to prevent unauthorised access.

16.3.6 The potential impact of noise on the PROW in close proximity to the site will be as a result of the operating of machinery and vehicles. A certain level of noise is inevitable due to the nature of the operations on site; however, this will be reduced through mitigation. The level of impact will depend on the proximity of the PROW to noise generating operations and the level of noise. However, the proposed extraction site should be able to be worked within the noise criteria in the NPPF to be normally justified for mineral extraction operations.

16.3.7 Dust can be generated by numerous activities associated with mining and quarrying and has the potential to impact on users of PROW. However, dust emission potential will be reduced through the adoption of a range of mitigation measures outlined within Chapter 11.3 of this ES and ES Volume 2 Technical Appendix D.

16.3.8 Also, as part of the mitigation where footpaths HP14/4/1 and HP14/8/1 meet, prior to any blasting operations, a sentries will be available to supervise the blasting operations from the rights of way and warn any users of rights of way of the forthcoming blast. Each blast has an “exclusion zone” identified with sentries posted around the perimeter of the site. Appropriate warning signs will also be erected along existing and diverted footpaths for any users of rights of way from quarrying operations.

16.4 Conclusions

16.4.1 Some footpaths, namely diverted footpaths HP14/7/1, HP14/8/1 and HP14/8/2 will run close to the operations and there will be views of the operations due to the proximity of workings. These impacts will be in place during Phases 1 to 3 of operations and will be transient whilst operations are taking place in proximity to the footpath. A 1.5m high soil bund will be created and maintained for the duration of operations to assist with screening operations.

16.4.2 The diverted routes will become permanent due to the proposed phasing programme. These routes will be convenient and easy to follow. A process of liaison and consultation with Derbyshire County Council's Rights of Way Team during the course of the Application will ensure that all measures for the diversion of the PROW have been considered and any potential issues are addressed.

16.4.3 All impacts upon the amenity of users of the PROW in close proximity to the site will be mitigated to the highest standard possible to ensure that the development has minimal effect upon the continued use of the diverted PROW.

16.4.4 Taking account of the proposed diversion and potential mitigation measures, the proposed development can be worked without posing unacceptable harm to the PROW. The development does not introduce a new use to the area.

17 Climate Change

17.1 Policy Context

17.1.1 The development proposals must demonstrate acknowledgement and adaptation to the impacts of climate change, in accordance with local and national policy guidance. This chapter seeks to outline how the proposals will respond to climate change through demonstrating compliance with national and local standards of sustainability.

17.1.2 The development plans contain policies and text concerning Climate Change in connection with development proposals. The main policy within the development plan relating to the potential impact of the development on Climate Change is:

- NPPF Section 14
- The Derby and Derbyshire Minerals Local Plan (April 2000) and emerging New Minerals Local Plan
    - Policy MP3 – Measures to Reduce Environmental Impact
    - Policy MP4 – Interest of Acknowledged Environmental Importance
    - Policy SMP3 – Climate Change

17.1.3 In terms of the national planning policy position, Paragraph 148 of NPPF states that 'the planning system should support the transition to a low carbon future in a changing climate, taking full account of flood risk and coastal change. It should help to: shape places in ways that contribute to radical reductions in greenhouse gas emissions, minimise vulnerability and improve resilience, encourage the reuse of existing resources, including the conversion of existing buildings; and support renewable and low carbon energy and associated infrastructure."

17.1.4 The Government places great importance on the need to promote sustainable transport modes, in line with the Paris Climate Agreement which came into effect on the 4th November 2016. The Paris Agreement is the first global treaty aimed at reducing the emission of greenhouse gases and limiting global warming to <2°C.

17.2 Consideration of Potential Impact

17.2.1 Whilst national planning policy states that new development should be located so as to reduce greenhouse gas emissions, minerals are a finite resource that can only be worked where they are found (NPPF, paragraph 203).

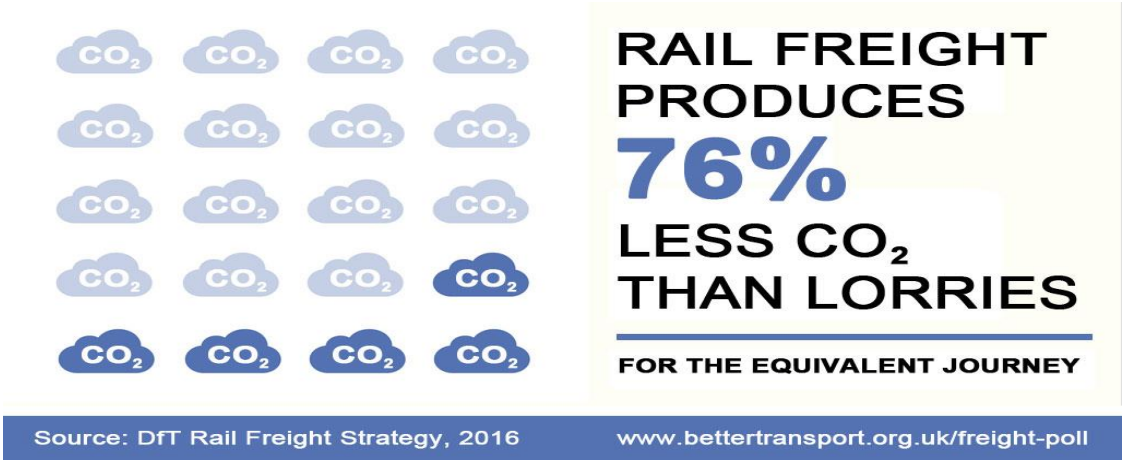
17.2.2 The effects of climate change and the vulnerability of the development proposal to these changes has been considered as part of the preparation of the ES, particularly in terms of hydrology / flood risk and ecology (i.e. the impacts of climate change on habitats / species).

17.2.3 As the site is over 1Ha a Flood Risk Assessment was required to comply with the NPPF. The risk of flooding to the site from fluvial, groundwater, surface water and sewage / water mains is very low to negligible.

17.2.4 The assessed flood risk to or from is the site is generally low or negligible therefore no site-specific mitigation actions are proposed / required. This assumes implementation of a quarry water management system and working procedures to facilitate the safe operation of the quarry.

17.2.5 Sustainable transport forms one of the core land-use planning principles within the National Planning Policy Framework which will help deliver sustainable development. European Regulation (EU) 2019/1242, which entered into force on the 14th August 2019, supports a reduction in CO2 emissions through utilising sustainable transport modes and sets CO2 emission standards for heavy-duty vehicles.

17.2.6 As set out in the Department for Transport (DfT) Rail Freight Strategy September 2016, as rail freight produces 76% less CO2 emissions than the equivalent HGV journey, increasing rail freight is an important part of the DfT's policy to reduce freight's emissions and help the UK meet its legally binding Climate Change targets.



17.2.7 Rail freight also produces fewer harmful gases than road freight when considering additional emission sources that can result in negative health and environmental impacts. Rail transport produces less than a tenth of the nitrogen oxide and fine particulates per tonne carried when compared to road transport (Source:

http://www.ukraildev.net/wp-content/uploads/2016/11/The-Value-and-Importance-of-rail-Freight-summary-report.pdf).

17.2.8 The utilisation of the existing rail infrastructure to load and transport mineral represents a sustainable use of existing infrastructure and the transportation of a significant proportion of the mineral recovered from the site by rail represents a significant reduction in vehicular emissions when compared with all the mineral being transported to market by HGV.

17.2.9 With the site having an existing rail connection, it enables the sustainable transportation of products to destinations further than local markets to supply key infrastructure projects such as the HS2 development which is currently being constructed between London and Birmingham where there are significant shortfalls in suitable construction aggregates.

17.2.10 Hindlow Quarry is an existing mineral site with a significant resource of proven limestone reserves which at predicted rates of extraction could operate throughout the whole of the 21st century producing both industrial limestone for the on site lime kilns and construction aggregates for the local and wider regional markets. These reserves will help to maintain and support the existing plant and infrastructure on site and reflect a more sustainable approach of utilising existing proven reserves and infrastructure rather than having to develop alternative supply options such as the development of new, greenfield sites.

.17.2.11 Importing stone for use in the kilns leads to overbreak of c. 10% (??) of the imported product which must be screened off the lumpstone, stockpiled, and ultimately blended with product and sold as aggregate from site. Production of kilnstone on site removes this wasteage, and therefore reduces haulage emissions by a further 10%, as well as the additional associated emissions with re-processing.

17.3 Consideration of Potential Mitigation

17.3.1 The proposed development plans to utilise the existing rail link at the quarry. As outlined within paragraph 15.2.15 it is proposed to increase the number of rail exports from the site to ~1400 from 130 in 2020.

17.3.2 As well as complying with the policy listed within the transport section of this ES, rail transport will ensure Hindlow remains considerate of its pollution through the extensive timeframe the site is to be operational. On a tonne for tonne basis, rail

movement produces 76% less CO2 than road, fifteen times lower NOx emission and almost 90% lower PM_{10} emission as concluded within a Sustainable Transport study conducted by the Department for Transport in 2008.

17.3.3 Additionally, the company propose to continue undertaking best practice measures and are committed to ensuring that site operations utilising plant and machinery are as efficient as possible.

17.3.4 As an operator, the applicant, is committed to ensuring they work in a sustainable manner across all areas of the company. They have reduced their CO_2 per tonne output of product by 23.5% since their 1990 figures. They have used 108,000 tonnes of waste derived fuels and 100% of electricity used by the company is from renewable sources. The cement aspect of the business has already focused on replacing fossil fuels with 'waste-derived' fuels, especially those with a biomass content. In 2019, over 35% of the heat input to cement kilns came from waste-derived fuels, including 14% from biomass content. They plan to continue and expand this process moving forward, implementing it across the business (information sourced from Tarmac website www.tarmac.com).

17.3.5 Regarding transport, the applicant states that their rail strategy has a big part in reducing emissions from transport. They are investing in new rail handling facilities and rail sidings to transport more material by rail instead of road; this scheme does exactly this. By doing so they are bringing significant CO_2 savings. Tarmac have the largest rail operations in the industry with over 9 million tonnes of mineral being transported by rail.

17.4 Climate Change Conclusions

17.4.1 Addressing climate change is the cornerstone of the applicant's approach to sustainability. This is set out in the applicants website "We have fully committed to supporting the UK's ambition of net-zero carbon emissions by 2050 and are making progress right across our business and supply chain, using a whole life-cycle approach to design CO_2 out of our products and services. This includes working with suppliers to reduce CO_2 from the goods and services we buy, cutting CO_2 from our operations and transport, innovating lower CO_2 products, services and solutions that reduce CO_2 from the construction process or during the use of infrastructure and buildings."

17.4.2 In terms of the effects on climate change, taking the above considerations into account, it is evident that the proposed development represents an appropriate use of the site whilst avoiding increased vulnerability to the range of impacts arising from climate change.

17.4.3 In terms of meeting the challenge of climate change, the proposed development and operations will not have unacceptable direct or indirect impact on population and human health; biodiversity; land, soil, water, air and climate; material assets, the landscape; or the interaction between these factors in accordance with EIA regulations.

18 Socio Economic Assessment

18.1 Introduction

18.1.1 The assessment describes current economic and social conditions in the area around Hindlow Quarry as a precursor to considering likely impacts on the local economy and its population if the quarry was closed.

18.1.2 No evaluation has been made of any effects on the existing social infrastructure (e.g. schools, health facilities etc.), which would be expected to be very small.

18.2 Description of the proposed development scheme

18.2.1 The current First Periodic ROMP Review is required by the Environment Act 1995 which places the requirement on the mineral owner/operator to submit to the Mineral Planning Authority (MPA) for approval, a scheme to demonstrate how the development of the 'mining site' (i.e. Hindlow Quarry) can be carried out in an environmentally acceptable manner. The overarching aim of the ROMP Review is to ensure that new conditions are consistent with modern environmental standards and working practices

18.2.2 The proposal is fully described in both the application documents and this ES.

18.3 Geographical scope of assessment

18.3.1 The geographical scope of the assessment concentrates on the area most directly affected by the quarrying activities at Hindlow Quarry. It is defined by reference to geographical units for which economic and socio-economic data are available.

18.3.2 The quarry is located within the High Peak Borough Council.

18.4 Population and Employment

18.4.1 The local administrative area of the High Peak Borough Council which has a population of 90,892 according to census data collected during 2011. The population of the Borough has increased by less than 2% from 89,433 in 2001.

18.4.2 The population density of the borough during 2011 was 1.7 (persons per hectare), much lower than the average for England of 4.1 (persons per hectare).

18.4.3 Employment levels in the High peak are very slightly higher than the national average (figures for England are presented in brackets).

Full time employment - 39.1% (38.6%);

Part time employment – 15.3% (13.7%); and

Self employed – 11.1 % (9.8%).

18.4.4 Information presented by the Office of National statistics for the Borough shows that the main employment sectors in the Borough were as follows in table 18.1

Table 18.1 - Main Employment Sectors in High Peak Borough

EMPLOYMENT SECTOR	**HIGH PEAK BOROUGH COUNCIL**	**ENGLAND**
PROFFESSIONAL OCCUPATIONS	17.8%	17.5%
SKILLED TRADES OCCUPATIONS	12.6%	11.4%
ASSOCIATE PROFFESSIONAL AND TECHNICAL OCCUPATIONS	11.7%	12.8%
MANAGERS DIRECTORS AND SENIOR OFFICIALS	11.3%	10.9%
ELEMENTARY OCCUPATIONS	10.4%	11.1%
ADMINISTRATIVE AND SECRETARIAL OCCUPATIONS	10.1%	11.5%
CARING, LEISURE AND OTHER SERVICE OCCUPATIONS	10%	9.3%
PROCESS, PLANT AND MACHINE OPERATIVES	9%	7.2%
SALES AND CUSTOMER SERVICE OCCUPATIONS	7%	8.4%

18.4.5 The data presented above was collected during the 2011 census and demonstrates that the largest employment sectors in the Borough are professional occupations, skilled trades occupations, associate professional and technical occupations along with Managers, Directors and Senior Officials. These sectors represent traditional professional and office-based employment.

18.4.6 Employment within the High Peak is roughly in line with the levels of employment in each sector nationally. The exception to this is in the employment sector of Process, Plant and Machine Operatives where employment levels are higher. This is likely to be due to the rural nature of the area and presence of quarrying and manufacturing activities in the Borough.

18.5 Quarrying's role within the wider economy

18.5.1 It is necessary to turn to national data to obtain a better picture of the relative weight and importance of quarrying in the wider economy.

18.5.2 Table 18.2 – please see below/ overleaf – provides data on gross value added (GVA) and employment, by sector of the economy. Gross value added (GVA) is defined by the Office for National Statistics as '*The value generated by any unit engaged in production, and the contributions of individual sectors or industries to gross domestic product. It is measured at basic prices, excluding taxes less subsidies on products.'* GVA provides a good measure of economic productivity, together with the calculated GVA per employee. This last column of figures is important for any assessment of the effects of changes in quarrying output.

18.5.3 Employment data in Table 18.2 is based on 2012 Labour Market Figures from the Office for National Statistics. The GVA figures are for 2010 and are taken from the National Statistics Blue Book: 2012 Edition - (*Table 2.3 Gross value added at current basic prices by industry, 2003–2010*) and employment figures from the Office of National Statistics dataset 'JOBS02 Workforce jobs by industry (not seasonally adjusted) – Figures for March 2013). Whilst the two data sets look at slightly different periods (the GVA at current prices provides data from 2010 and the Employment data is from March 2013) it is considered that for the purposes of the point being made in this report that the figures are sufficiently compatible to provide the general impression of the value of GVA and employment market for different sectors at present.

Table 18.2 – Structure of the UK Economy

Industry Sector	GVA at Current Basic Prices (£ Million) ONS Blue Book 2012 Table 2.3	**Employment (,000)** ONS Workforce Jobs by Industry (not Seasonally Adjusted) March 13	GVA per Employee (£)
Agriculture	8,333	361	£23,083
Production (Include Mining manufacturing and utilities	210,335	3005	£69,995

shown in boxes below)			
Mining and quarrying (figures form part of the 'Production' figures)	35,589	68	£523,367
Manufacturing (figures form part of the 'Production' figures)	139,120	2612	£53,261
Electricity, gas, steam and air conditioning supply / Water supply, sewerage, waste mgmt and remediation (figures form part of the 'Production' figures)	35,626	325	£109,618
Construction	83,280	1,992	£41,807
Information and communication	74,601	1,320	£56,515
Financial and insurance	123,021	1,149	£107,067
Real estate	104,583	511	£204,663
Professional and support	152,322	5130	£29,692
Government, health and education (incl. defence)	260,993	8510	£30,668
Pubic Admin, defence compulsory social security NB Figures form part of the 'Government health and education figures	69,918	1577	£44,336
Other Services (incl. Art, entertainment, recreation, Other Service activities et al)	4,4249	1760	£25,141
Totals All Industries	**1,308,962**	**32239**	**£40,601**

18.5.4 As can be seen, the extractive industries are much more capital intensive than any other sector of the British economy, with very high levels of labour productivity (measured by GVA per employee) as a consequence.

18.5.5 Table 18.3 – please see below – shows how the different sectors of the British economy interact with each other. Each column in Table 18.3 shows where the particular sector of the economy spent its money (on both capital investment goods and operating costs) in order to generate its own outputs. These purchases of goods and services are known as 'intermediate consumption'. Thus, for example, it shows that in order to produce a GVA figure of £35.5 billion (see Table 18.2), the mining and quarrying sector purchased a total of £5 billion's worth of intermediate consumption, with spending particularly high in the transport and construction sectors.

Table 18.3 – Consumption by Industry Group

INTERMEDIATE CONSUMPTION BY INDUSTRY GROUP					
	1	2	3	4	5
	Agriculture	Production	Construction	Distribution, transport, hotels and restaurants	Information and communication
PRODUCTS					
Agriculture [1-3]	2 762	12 074	228	1 632	9
Production [5-39]	7 274	305 268	35 045	69 419	16 436
Other Mining and Quarry Products (8)	***-***	***2 650***	***2 258***	***226***	***10***
Construction [41-43]	370	4 877	60 103	13 427	1 644
Distribution, transport, hotels and restaurants [45-56]	856	15 585	3 384	62 314	4 425
Information and communication [58-63]	205	6 717	1 391	17 234	17 255
Financial and insurance [64-66]	552	11 858	2 877	8 567	1 989
Real estate [68.1-2-68.3]	107	1 746	2 372	15 706	1 215
Professional and support activities [69.1-82]	1 167	25 704	17 788	45 300	20 344
Government, health & education [84-88]	25	2 616	1 265	4 966	1 157
Other services [90-97]	71	1 115	130	1 809	3 126
Total consumption	13 389	387 560	124 583	240 374	67 600
Taxes *less* subsidies on production	-2 521	4 854	1 130	11 808	1 290
Compensation of employees	3 330	116 793	46 408	165 607	47 950
Gross operating surplus	7 524	88 688	35 742	69 829	25 361

Gross value added at basic prices	8 333	210 335	83 280	247 244	74 601
	1	2	3	4	5
	Agriculture	Production	Construction	Distribution, transport, hotels and restaurants	Information and communication
PRODUCTS					
Output at basic prices	21 722	597 895	207 863	487 618	142 201

18.5.6 As can be seen, the extractive industries are much more capital intensive than any other sector of the British economy, with very high levels of labour productivity (measured by GVA per employee) as a consequence.

18.5.7 This data is important, since it provides an indication of the indirect effects of quarrying operations, including how the additional expenditure generated from this activity is likely to be distributed across other parts of the local economy, and hence whether jobs could be retained or generated in these sectors.

HIGH PEAK BOROUGH COUNCIL REPORT ON MINERALS AND AGGREGATE EXTRACTION IN HIGH PEAK AND DERBYSHIRE DALES (JULY 2017)

18.5.8 In July 2017, High Peak Borough Council produced a report on Minerals and Aggregate Extraction in High Peak and Derbyshire Dales, a sector benefits study.

18.5.9 The key messages from the study are set out below :

18.5.10 “mineral extraction activities in the High Peak and Derbyshire Dales areas is a **resource of national significance**, contributing around 7% towards the national supply of minerals annually. An assessment of the area’s ‘landbank’ has found ample reserves that could provide vital resources for years to come”.

18.5.11 “Without the aggregate resource from the two districts, the viability of major capital development projects across the Midlands and Northern regions would be compromised. High transport costs mean that there is an **inherent need for local aggregate resource”.**.

18.5.12 “There are currently 924 direct full time equivalent (FTE) jobs in the mining and quarrying sector across the Derbyshire Dales and High Peak districts and the vast majority of these jobs are filled by residents in these districts (878 FTE jobs) which accounts for 82% of Derbyshire’s workforce in this sector”.

18.5.13 "Beyond 'direct' extraction activities, the sector has sizable 'upstream' and 'downstream' supply chains and **a large proportion of the minerals supply chain is located close to quarry sites**. There are currently around 950 businesses operating locally in relevant supply chain sectors. Although a large proportion of these businesses will not be operating exclusively within the minerals supply chain, this nevertheless represents around 1 in 10 of the total business stock in the two districts (8,950 businesses).".

18.5.14 **"Minerals extraction activities in High Peak and Derbyshire Dales are estimated to currently support 2,056 FTE jobs nationally**, either directly, or through indirect and induced effects. Of these, it is estimated that **1,740 net FTE jobs (85%) are located within the (Derbyshire/Derby/Nottinghamshire/Nottingham) and Sheffield City Region LEP areas and 1,437 net FTE (70%) are located within the two districts themselves.**"

18.5.15 "The long-term Gross Value Added (GVA) contribution to the local economy from mining and quarry activities in the High Peak and Derbyshire Dales is estimated to be £2.350bn in GVA by 2040, £1.633bn at present value. When including the whole of the sector's supply chain, it is estimated that **mining and quarrying activities in High Peak and Derbyshire Dales will contribute a total of £3.150bn in GVA towards the national economy by 2040, £2.188bn at present value."**

18.5.16 "At £316m per year, the annual estimated turnover achieved by businesses operating in the mining and quarrying sector in the High Peak and Derbyshire Dales areas is equivalent to around three-quarters of the annual turnover achieved in the visitor economy in the Peak District National Park and its surrounding area of influence."

18.5.17 The report concludes that with "**Major capital development and infrastructure projects across the midlands and northern regions of England will continue to be key drivers for product demand** from the minerals sector. Ensuring an ongoing pipeline of major development projects will therefore help to ensure that demand for minerals products remains high."

18.5.18 Although Hindlow has been dormant in terms of extraction for a number of years this demand for product has resulted in extraction activities re-commencing at the site. Although the quarry has remained dormant the existing lime processing works at Hindlow has been operational throughout utilising imported stone from Tunstead Quarry via rail. The strategic importance of Hindlow Quarry in terms of economic

importance is discussed further below.

18.6 Current economic importance

Processes and employment

18.6.1 Derbyshire, combined with the Peak District National Park, is one of the largest producers of aggregate grade crushed rock in this country. According to the Derbyshire Local Aggregate Assessment 2019, "it is crucial that Derbyshire County Council and the PDNPA, as MPA's for the area, are able to ensure a steady and adequate supply of mineral to realise these growth aims and to maintain the infrastructure already developed. Since the area also supplies a significant amount of aggregate to a large part of the country, particularly crushed rock, this need to maintain a steady and adequate supply of mineral applies to this much wider area".

18.6.2 Derbyshire is also a very important "industrial" mineral where its chemical properties make it a valuable mineral for a wide range of industrial/manufacturing uses. Recently around 3 million tonnes was quarried annually within Derbyshire and the Peak Park. One such use for this industrial mineral involves the calcination (heating) of limestone which is used in the production of lime

18.6.3 Although limestones occur widely in England, many are unsuitable for industrial use because of their chemical and physical properties. The carboniferous limestones of Derbyshire and the Peak Park are one of the most important resources of industrial limestone in England. The Bee Low limestones are units of consistently high purity and uniform chemistry. The Bee Low limestones at Hindlow are suitable for the existing lime works and will avoid the importation of this type of stone.

18.6.4 Historically, Hindlow Quarry has been worked for limestone to feed the kilns on site for the manufacture of lime products. Any out of specification material, unsuitable for lime manufacture, was stockpiled on site creating large scalping stockpiles. Whilst mineral related activities take place on site there has been no winning and working of the insitu limestone reserves since 1988. Following the mothballing of the quarry in 1988, limestone was imported by rail from the nearby Tunstead Quarry to continue the lime manufacturing at Hindlow. Any material unsuitable for lime manufacture was added to the scalping stockpiles. Periodically, since 1988 these stockpiles have been worked for their qualities as construction aggregate and have been sold and

distributed from site for this purpose. More recently this material has been supplied to construction contracts by rail from Hindlow.

18.6.5 With an anticipated increase in demand for construction aggregates and a readily useable rail connection, the company have re-commenced the mineral extraction at Hindlow Quarry to continue the manufacture of lime products, supplying construction aggregates along with increasing the working of the existing stockpiles of scalping's for aggregate production.

18.6.6 The mineral reserve at Hindlow quarry currently stands at approximately 182 million tonnes (that is, reserves identified in 2020 in accordance with the proposed phasing programme). Due to the increased demand from projects such as HS2 it is proposing to ramp up production to around 2 million tonnes per annum. Assuming that production levels continue at around 2 million tonnes per year, the company anticipate that reserves would remain up to the beginning of the next century. This ROMP Application considers the phasing operations up to 2042.

18.6.7 In terms of employees, Hindlow Quarry has around 35 full time employees on site albeit due to their shift patterns not all of them are on site at the same time. On a typical day there is around 20-25 people on site. With regard to the hauliers / drivers they aren't based at site and are all employees of contract hauliers.

18.6.8 The quarry is a significant contributor to the local economy. It is estimated that this contribution equates to over £5 million per annum based on 2020 figures below.

Table 18.4 – Quarry Spend

Hindlow Quarry Spend 2020	Full Year 2020 £k
Wages	926,461
Rates (Property Tax)	248,818
Haulage	1,787,063
3rd Party Factored	2,073,407
Total	**5,035,407**

*This is a proportion of the total site not including CPR & RMX & Asphalt which will also get charged

18.7 Development proposal and future economic and social conditions

18.7.1 This section seeks to estimate the economic impacts of continuing quarrying activities at Hindlow Quarry. With the proposed increase in production it is likely that additional jobs will be created both directly and via 3rd party suppliers of goods and services.

18.7.2 As well as the direct benefits to the Company and the employment effects which benefit their workforce, there will be a series of spin-off benefits which are referred to as 'indirect effects'.

18.7.3 These arise because the Company's expenditure induces their suppliers to sustain their production to meet the needs of Hindlow Quarry. In a 'virtuous circle', any sales made by the quarry's suppliers generate more business for the firms which in turn supply them. These effects are referred to as 'indirect effects' and occur down the supply chain. An example of such use is the individual hauliers that deliver materials from the site.

18.7.4 Finally, there are 'induced effects', which arise from the income earned by local employees being spent on household and personal goods and services within the local economy. The extent of this effect is a matter of some debate and difficult to predict in an accurate way.

18.7.5 In an assessment of purely local effects it is also important to recognise that some of the benefits (direct, indirect and induced) will not accrue to the local economy by, for example, Hindlow Quarry purchasing a major item of capital equipment from another region, or by some of the workers and their families spending their wages on holidays in other regions, or abroad. Such effects are referred to as leakage, displacement, and substitution of benefits.

18.7.6 Leakage refers to the proportion of outputs that benefit persons and companies outside the local area. Displacement reflects the degree to which retained production at Hindlow Quarry is offset by reduced opportunities for expansion elsewhere. Substitution occurs when a firm substitutes one activity for a similar activity (such as recruiting a jobless person while another employee loses a job, to take advantage of public sector assistance). These factors should be taken into account when estimating the local impacts of the direct, indirect and induced effects of any development. Guidance provided by English Partnerships in their 'Additionality Guide - Third Edition', dated October 2008, is often used to estimate the appropriate factor by

which indirect and induced effects should be reduced in order to estimate the local impacts of a development scheme.

18.8 Direct Economic Effects

18.8.1 The proposed continuation of operations at Hindlow Quarry will sustain, increase and protect jobs that could otherwise eventually be lost. Most of the quarry's employees come from the local area. The Company is therefore important locally and continuing operations will help secure these jobs. The value of the proposed development is therefore clear at a local level as recognised by the report produced by High Peak Borough Council.

18.8.2 As set out above, the Company advises that Hindlow Quarry has an average expenditure of approximately £5million per annum on external suppliers, goods and services over the period, as well as contributing to the national and local tax base.

18.9 Indirect Economic Effects

18.9.1 In theory, it would be possible to allocate this figure of £5million to different economic sectors (manufacturing industry, utility services, construction etc), using a different multiplier for each sector. In practice, because many of the main suppliers span different sectors (by providing design advice and maintenance services as well as hardware), this is potentially misleading. It has been concluded that it would be more appropriate to use an average factor which applies across all economic sectors, namely the figure of £40,601 GVA per employee – as outlined in Table 19.1: Structure of the UK Economy (Source: ONS Blue Book 2012 and ONS Workforce Jobs by Industry March 2013). This is a lower figure than would apply to manufacturing industry, information and communication, and the financial and insurance sectors, but higher than that applicable to government, health and education (including defence), professional and support, and other services.

18.10 Induced Effects

18.10.1 In the absence of detailed data on the consumption patterns of local employees, it is usual to estimate induced effects by making use of the same guidance from English Partnerships as referred to above. This suggests that an uplift figure of 10% could be applied to existing employment figures to identify an induced employment effect. Hence if the direct employment effect is to at least retain 35 jobs then uplifting this

total by 10% would provide a reasonable estimate of 39 (no.) jobs for the induced employment benefit.

18.11 Socio Economic Conclusions

18.11.1 The proposed continuation of operations at Hindlow Quarry will sustain, increase and protect jobs that could otherwise eventually be lost. Most of the quarry's employees come from the local area. The Company is therefore important locally and continuing operations will help secure these jobs. The value of the proposed development is therefore clear at a local level as recognised by the report produced by High Peak Borough Council.

18.11.2 In addition to the direct and indirect benefits of the proposal, it will also induce benefits to the local and national economy through a multiplier effect. The overall contribution to the local economy from the site is not insignificant.

18.11.3 The report from High Peak Borough Council on minerals and aggregate extraction in the High Peak reflects the importance of the quarrying industry and concludes that it "is a **resource of national significance".** Hindlow Quarry, with its significant reserves of limestone will be an important strategic site in supplying product demand for major capital development and infrastructure projects across the midlands and northern regions of England for the remaining part of this century.

19 Cumulative Impact

19.1 Introduction

19.1.1 Hindlow Quarry is one of four large limestone quarries (the others being Hillhead, Brierlow, and Dowlow Quarries) which lie close to the A515 Buxton to Ashbourne Road (see Figure A Location Plan) located within the administrative boundary of Derbyshire County Council. The site is situated between Brierlow Quarry to the north-west and Dowlow Quarry to the south-east and abuts both.

19.1.2 A ROMP review was made for Brierlow Quarry in 2013. Dowlow Quarry submitted a ROMP review in October 2017. Two undetermined applications were also submitted at Dowlow quarry to work mineral above the water table.

19.1.3 This section of the ES addresses the cumulative impact of the proposed development to examine if any changes will arise from the proposal that, when combined with other developments and activities in the area, will in some way result in the proposed phasing scheme being unacceptable.

19.1.4 Throughout this ES and associated technical appendices, the impacts that the development could potentially have on the site and the surrounding area have been assessed. This report draws together the findings of all the technical assessments and outlines whether any cumulative impacts may emerge from the interaction between different environmental impacts.

19.1.5 Cumulative impacts relate to the way in which different impacts can affect a particular environmental resource or location incrementally. In essence, cumulative impacts are those which result from incremental changes caused by other past, present or reasonably foreseeable developments, together with the proposed development. Therefore, the potential impacts of the proposed development cannot be considered in isolation but must be considered in addition to impacts already arising from existing or planned development.

19.2 Approach and Methodology

19.2.1 Cumulative impact assessment does not have a dedicated section within the NPPF. However, the consideration of cumulative effects from a development is referred to and required when evaluating the environmental impact of a development proposal. In regard to minerals development, NPPF paragraph 204 (f) states that planning

policies should set requirements to ensure that permitted and proposed operations do not have unacceptable adverse impacts on the natural and historic environment or human health, considering the cumulative effects of multiple impacts from individual sites and/or a number of sites in a locality. The Scoping Opinion from the MPA has also stated that the potential for cumulative impact needs to be addressed as part of this ES.

19.3 Key Impacts of the Proposal

19.3.1 With any quarry operation the key environmental impacts are generally noise, dust, and traffic. Due to the relatively remote nature of the site, the environmental impacts are generally localised to an area within the quarry boundaries and therefore will not give rise to impacts significant enough to be able to combine with other off-site impacts and thereby result in an accumulation of impacts.

19.3.2 Noise, dust, traffic, and vibration can all have effects beyond the site boundary, however, investigations have been undertaken and the scheme has been designed to ensure that any such effects continue to comply with the existing limits and restrictions that apply to the quarry. No other operations in the area are likely to have profiles that will exacerbate noise, dust, traffic, or vibration to unacceptable levels.

19.3.3 No hydrogeological or flood risk impacts are expected from the scheme up to 2035 whilst working is taking place above the water table and no other activities around the site are likely to interact with hydrogeology and flood risk to result in cumulative worsening. While no dewatering is taking place at Hindlow, Brierlow and Dowlow, cumulative impacts to the existing groundwater flow pattern are considered to be negligible. Dewatering is required to gain access to the full reserves at the quarry, however, it will only take place once a full hydrogeological study has been completed and a dewatering scheme has been agreed, with suitable mitigation measures in place, if these are required.

19.3.4 In light of the above, it is clear that there are no anticipated local affects that might, through accumulation with other activities from either within or outside the site, result in a significant worsening of the environment as a result of the proposed scheme.

19.4 Successive Impacts

19.4.1 Historically, Hindlow Quarry has been worked for limestone to feed the kilns on site for the manufacture of lime products. Any out of specification material, unsuitable for lime manufacture, was stockpiled on site creating large scalping stockpiles. Following the mothballing of the quarry in 1988, limestone was imported by rail from the nearby Tunstead Quarry to continue the lime manufacturing at Hindlow. Any material unsuitable for lime manufacture was added to the scalping stockpiles.

19.4.2 Although Hindlow Quarry is a well-established mineral site, it is only recently that quarrying operations have ramped up following increased demand for construction aggregates from major projects such as HS2. Even though quarrying operations have only recently commenced again, the extant Planning Permissions governing Hindlow Quarry includes various environmental restrictions designed to ensure that the quarry operations are restricted to a level that will not have an unacceptable impact on the local community and environment.

19.4.3 Access and egress from Hindlow Quarry are via a private entrance and access road off the A515. This access road is surfaced. This will remain unchanged for the next phases of development.

19.4.4 Although it is proposed to increase production to around 2 million tonnes per annum the overall change in traffic volumes would be minimal along the A515 with an increase on two 2-way movements per hour. The majority of future product from the site is likely to be exported by rail.

19.4.5 In light of the above, the successive impacts of the proposal are considered to be negligible.

19.5 Simultaneous Impacts – Other Major Developments in the Locality

19.5.1 A further consideration when addressing cumulative impact is the potential impacts that will arise when combined with committed or proposed development in the area i.e. schemes that are proposed but have not yet been implemented.

19.5.2 A review of Derbyshire County Council website has been undertaken to ascertain whether there are any planning applications within close proximity that may lead cumulatively to adverse/unacceptable impact upon local receptors.

1.4.3 With regard to Dowlow Quarry, in October 2017 three planning applications were

submitted and are currently undetermined by Derbyshire County Council. One of the applications relate to the regularisation of the extraction limit (CM1/1017/57), the second application relates to a 10-hectare extension of the quarry (CM1/1017/58) and the third relates to a First periodic Review ROMP (R/1017/33). Although the second Planning Application is for an extension of the site, there is no increase in reserves because the extension relates to creating further capacity for tipping of materials which in turn will prevent double handling. In January 2019, the total permitted reserves were 82.6 million tonnes. The annual output is around 2 million tonnes pa which is split 1.5 million aggregate and 0.5 industrial (source Derbyshire County website).

19.5.3 With regard to Brierlow Quarry, in 2013 a ROMP application was submitted to DCC (R1/1213/28) which remains undetermined. Permitted reserves of 51 Million tonnes in 2013 with a production rate of around 500,000 tonnes pa (source Derbyshire County Council website). No information on the split between industrial and aggregate production.

19.5.4 Both Dowlow and Brierlow Quarries are long established operations in this locality. Currently, both sites are operating under Planning permissions which will expire in 2042. At Brierlow, based on the current production levels and permitted reserves, extraction should be completed prior to 2042 unless a further application is granted to extend the operations. At Dowlow, based on current production levels and permitted reserves, extraction should cease around 2060 if Planning Permission is granted to extend the operations beyond 2042.

19.5.5 Therefore, both quarries along with Hindlow are likely to be operational up to 2042 and consideration has to be given to cumulative impact upon local receptors.

19.5.6 In terms of noise, the noise assessment used receptors at Sterndale Moor and Earl Sterndale which are in excess of 700m from both Dowlow and Brierlow. Given the separation distance from the quarries the noise assessment concludes that it is unlikely that noise levels from operations at Brierlow and Dowlow will exceed those at Hindlow. Worst case potential noise levels predicted from Hindlow Quarry operations have been identified at 48 dB at Sterndale Moor and 41 dB at Earl Sterndale. These levels are 7 dB and 14 dB below the 55 dB daytime noise limit respectively and therefore any noise contributions are unlikely to be significant in achieving this limit.

19.5.7 As previously set out in the air quality chapter, detailed dust deposition impacts from hard rock quarries are considered ineffective at distances in effect from 400m. Given the separation distances from neighbouring quarrying operations to the receptor locations identified in the air quality chapter and the variation in dust directionality of dust source the likelihood of cumulative dust impacts is considered to be low.

19.5.8 The Automatic Urban and Rural Network (AURN) data utilised in the air quality assessment takes into account the cumulative impacts because the existing particulate concentrations at the assessment locations include neighbouring sources.

19.5.9 With regard to the cumulative impacts of blasting and vibration, the maximum satisfactory magnitudes of vibration with respect to human response from blasting are detailed within BS 6472-2: 2008. The standard recommends that for up to three blast events per day satisfactory magnitudes of vibration are between 6mm and 10mms at 90% confidence level as measured outside of a building on a well-founded hard surface as close to the building as possible. The frequency of blasting at Hindlow Quarry is anticipated to be less than two blasts per day and liaison with neighbouring quarry operators and the continuing use of the existing site vibration criteria will ensure compliance with BS 6472-2: 2008.

19.5.10 All research and previous work undertaken has indicated that any vibration induced damage will occur immediately if the damage threshold has been exceeded and that there is no evidence of long-term effects.

19.5.11 In considering the likely significance of cumulative landscape and visual effects it must be borne in mind that the majority of the current and potential future changes associated with the combined quarries will be the permitted expansion of extraction footprints, but mainly the progressive deepening of quarry voids. It must also be considered that the permitted / proposed developments are all located in a very large scale and expansive landscape where variations in topography and landform are common and have the capacity to both screen and contain character areas and visual envelopes. These factors limiting both the potential for significant effects on character areas which vary within the combined quarries geographical context and prevent the majority of potential visual receptors having views of all or a number of the combined quarries from any one fixed receptor location. Potential cumulative visual effects could occur if they are sequential in nature, for example users of the local public right of way network or road users who travel along the A515 / other roads in proximity to

the quarries.

19.5.12 There are *"active and historic limestone quarries"* located to the north-west of Hindlow Quarry (Hillhead Quarry and Brierlow Quarry) and south-east (Dowlow Quarry). The 'corridor' of quarries from Harpur Hill to the north and the southern area of Dowlow Quarry near Hurdlow Grange covers approximately 6km. These quarries have existing planning permissions and are currently being considered by recent planning ROMP reviews. The footprints of these quarries do on the whole, already comprise either disturbed ground, active rock extraction, stocking areas, rail sidings, plant / built structures and tips. There are also smaller areas of agricultural land which will be stripped to expose rock for future extraction, processing, and sale off site.

19.5.13 In respect of landscape character, we do not consider that likely significant cumulative effects will occur either on the physical fabric of the landscape or the special value of surrounding land designated as National Park.

19.5.14 In respect of the potential for cumulative visual effects there are individual and sequential visual receptors specifically associated with the local public rights of way network including The High Peak Trail, HP14/4/1 located to the west of Hindlow / Dowlow / Brierlow Quarries and HP14/8/1 / HP14/8/2 and WD25/8/1 to the east where receptors currently do and will continue to receive adverse visual effects from the individual/ combined quarries of Dowlow, Hindlow and/ or Brierlow Quarry. The individual impacts are however considered to be of similar levels of impact either based upon individual visual magnitudes of effect and / or cumulative magnitudes.

19.5.15 The Landscape and visual impact assessment therefore concludes that there will **not be** any significant cumulative effects on either landscape character or visual impact.

19.5.16 In terms of Cultural heritage the active quarries either side of Hindlow (Dowlow and Brierlow) both have permissions which will last until 2042, which is the timescale of the ROMP under consideration here for Hindlow Quarry. With regard to buried archaeological remains, both Dowlow and Brierlow have archaeological mitigation strategies in place, which will allow for the identification and recording of any such remains that might be discovered during the course of future quarrying. However, there is likely to be a cumulative effect due to the attrition of the archaeological resource thus identified. The significance of this cumulative effect is difficult to gauge, as the full extent of archaeological remains affected at each of the quarries will only be apparent following topsoil stripping.

19.5.17 There will be a continued cumulative visual effect upon the settings of nearby heritage assets from the cluster of three active quarries until 2042, but this will be subsequently reduced in magnitude should any of the three quarries cease extraction and move on to the afterluse phase and restoration.

19.5.18 The cumulative impacts on key ecological receptors are considered below.

19.5.19 The habitats identified during the Preliminary Ecological Appraisal all lie entirely within land associated with Hindlow Quarry and therefore the habitats will not be directly impacted by works carried out on adjacent land.

19.5.20 In relation to amphibians, ecological information for the adjacent sites does not identify the presence of amphibian populations within the area.

19.5.21 UK bat species have core sustenance zones that extends to several kilometres with the bats utilising a range of roosting features and habitats within that area. Any works that impact on roosting opportunities, foraging habitats or potential commuting routes within the area around Hindlow Quarry, including the adjacent quarries, may impact on populations of bats present on the site. The level of impact will depend on the species and roosts present in the area.

19.5.22 Although birds have a large zone of influence, particularly where the species are migratory, the impacts from the ongoing quarrying operations are predominantly on nesting birds, which makes cumulative impacts from works in the surrounding area unlikely.

19.5.23 Any invertebrates present on Hindlow Quarry may be subjected to additional impacts from the quarry operations, although this will include positive and negative impacts due to the ongoing creation and loss of habitats suitable to support invertebrate habitat.

19.5.24 Overall, it is considered that ecological cumulative impacts of the adjacent quarries are unlikely to be significant.

19.5.25 The Transport Assessment has considered the cumulative effects of the transportation issues at the site and concluded that the predicted small number of additional HGV's entering and leaving the site would not cause any cumulative impacts considering the other mineral operations in the vicinity of the site.

19.5.26 The Hydrogeological assessment has considered the cumulative effects of the

adjoining quarries and concluded that whilst no dewatering is taking place at any of the quarries, cumulative impacts to the existing groundwater flow pattern are considered to be negligible. Further assessment work will need to be carried out by all three quarries prior to any dewatering activities taking place.

19.5.27 The simultaneous and cumulative impacts of Hindlow and the adjacent quarries has been considered in the relevant chapters of this assessment. With regard to all of the technical issues there are no cumulative impacts that will arise from the scheme in that would render the proposed development unacceptable.

19.6 Assessment of Potential Combined Effects

19.6.1 The methodology for determining whether development has a combined adverse environmental effect has been established by Justice Burton as part of the Long Moor Inquiry (reference EWHC Admin 1427 2007). He advised that an assessment of cumulative impact on the basis of simple value judgements with no supporting reasons is inappropriate. As part of that judgement, 4 tests were provided that could be used to ascertain the impact. These are discussed to follow:

19.6.2 Test 1 – Even though each individual area of potential impact was not objectionable yet each such feature was close to objectionability that, although none could be said to be individually objectionable, yet because each was nearly objectionable, the totality was cumulatively objectionable.

19.6.3 In the above section, it has been considered that each individual area of potential impact is not, on balance, objectionable. Although the potential traffic, landscape, visual, noise, dust, vibration, and ecological impacts of the scheme would give rise to some negative impacts during the course of the operations, there would be no direct conflict with development plan policy and these individual issues would not come close to being objectionable. Similarly, the potential impacts on interests related to the water environment and cultural heritage are not considered to come close to being objectionable on an individual basis.

19.6.4 Therefore, overall, none of the individual areas of potential impact is considered to be close to being objectionable. Whilst it is accepted that other individual areas would give rise to varying degrees of negative impact during the course of the permission, they would not come close to being objectionable on an individual basis. It is therefore concluded that, because none of the impacts come close to being objectionable or

conflict with Development Plan Policy, the totality would not be objectionable.

19.6.5 Test 2 – One, two, three or four of the particular features were close to being objectionable and that would be an important matter to consider when looking at the totality.

19.6.6 In this case it is considered that none of the individual areas of potential impact is considered to be close to being objectionable. There is not therefore any combination of particular features that are considered to be important matters that could give rise to objections in regard to test two.

19.6.7 Test 3 – One particular combination of two or three otherwise unobjectionable features could cause objectionability in their totality.

19.6.8 In consideration of this matter there are individual features (impacts) which are related in terms of subject matter or in regard to the receptors in which they have the potential to impact upon and could therefore be considered in combination, namely:

I. Landscape/Visual Impact, Cultural Heritage and Ecological Impact;

II. Local Amenity impacts such as Noise, Dust, vibration, and Traffic

19.6.9 In relation point one, as discussed above, neither ecology, landscape and visual or cultural heritage effects are considered to be close to being objectionable. Therefore, in combination their totality would not amount to being objectionable.

19.6.10 In relation to the second suggested combination (local amenity impacts), as set out above, it is considered the Noise Impact Assessment has found that the calculated site noise levels for routine and temporary operations in the proposed phasing area comply with the suggested site noise limits at all the assessment locations, with the suggested mitigation measures implemented.

19.6.11 In terms of the potential for fugitive dust emissions, the Dust and Air Quality Assessment has found that with appropriate mitigation measures, the impacts of dust and air quality should be acceptable.

19.6.12 Regarding vibration, if the Company accord with the working recommendations given, there is no reason why blasting operations within the proposed phasing area at Hindlow Quarry will give rise to adverse comment due to induced vibration at any of the dwellings or structures in the vicinity.

19.6.13 In terms of traffic there are no material increases in HGV movements above and

beyond existing levels.

19.6.14 In light of the above it is concluded that there is no particular combination of two or three otherwise unobjectionable features that could cause objectionability in their totality.

19.6.15 In conclusion, it is considered that the above combination of impacts is not significant enough (due to the imposition of appropriate levels of mitigation) to give rise to objections in regard to test 3.

19.6.16 Test 4 – The fourth test to consider is whether there could be some unusual feature or some unusual combination of features that could, when combined, result in objection when the individual features were not.

19.6.17 The most unique features in close proximity to the proposed site is the four quarries which run alongside the A515. The simultaneous effects of these quarries have been considered and there are no cumulative impacts that will arise from the scheme in that would render the proposed development unacceptable.

19.6.18 As discussed above, neither the landscape and visual impacts, cultural heritage impacts or ecological impacts come close to being objectionable.

19.6.19 Furthermore, other potential negative environmental effects are short term and the overall impacts are not considered to be close to the thresholds of unacceptability.

Conclusions

19.6.20 It is considered the approach and methodology to assessing the combined negative effects is thorough and robust. Following an assessment of each of the four tests it has been concluded that no objectionable combined negative effects would be brought about by the proposed development at Hindlow Quarry.

19.7 Assessment of the Combination of Potential Positive Effects

19.7.1 In order to assess the overall cumulative impact of the continued operations at Hindlow in a balanced manner it is logical that the potential positive impacts of the scheme are identified and aggregated to indicate a potential cumulative positive effect. This enables them to be weighed, in combination, into an overall judgement of cumulative acceptability or otherwise. The operation would bring about a number of benefits to the local/regional area and also meet a number of the Government's objectives in relation to mineral supply.

19.7.2 The potential benefits of the scheme can be summarised into four main areas:

- Supply of aggregate/continuation of lime production/Socio-Economic benefits.

Supply of aggregate/continuation of lime production/Socio-Economic Benefits

1.1.1 As set out in the Socio-Economic Assessment, the Applicant has shown that there are many positive benefits to the continued operations at Hindlow Quarry. These are set out below:

19.7.3 Hindlow contains valuable reserves of the very important "industrial" mineral where its chemical properties make it a valuable mineral for a wide range of industrial / manufacturing uses. One such use for this industrial mineral involves the calcination (heating) of limestone which is used in the production of lime. The extraction of this stone will serve the existing lime production at Hindlow.

19.7.4 Although limestones occur widely in England, many are unsuitable for industrial use because of their chemical and physical properties. The carboniferous limestones at Hindlow are one of the most important resources of industrial limestone in England. The Bee Low limestones are units of consistently high purity and uniform chemistry. The Bee Low limestones at Hindlow are suitable for the existing lime works and will avoid the importation of this type of stone to serve the lime works.

19.7.5 Also, with an anticipated increase in demand for construction aggregates and a readily useable rail connection, the company have re-commenced the mineral extraction at Hindlow Quarry to continue supplying construction aggregates along with increasing the working of the existing stockpiles of scalping's for aggregate production.

19.7.6 The mineral reserve at Hindlow quarry currently stands at approximately 182 million tonnes (that is, reserves identified in 2020 in accordance with the proposed phasing programme). Due to the increased demand from projects such as HS2 it is proposing to ramp up production to around 2 million tonnes per annum. Assuming that production levels continue at around 2 million tonnes per year, the company anticipate that reserves would remain up to the beginning of the next century. This reflects the importance of this reserve in meeting Derbyshire's landbank requirements for the remaining part of this century.

19.7.7 In terms of employees, Hindlow Quarry has around 35 full time employees on site albeit due to their shift patterns not all of them are on site at the same time. On a

typical day there is around 20-25 people on site. This is likely to increase with the ramping up of production. With regard to the hauliers / drivers they are not based at site and are all employees of contract hauliers.

19.7.8 Therefore, in addition to the direct and indirect benefits of the proposal, it will also induce benefits to the local and national economy through a multiplier effect. The overall contribution to the local economy from the site is significant.

19.8 Summary Conclusion of Cumulative Impacts

19.8.1 In summary the proposals have been assessed against other committed and proposed quarrying developments in the area and there are no cumulative impacts that will arise from the scheme in combination either within itself or with other existing / proposed developments that would render the proposed quarry phasing unacceptable.

20 Environmental Statement Conclusions

20.1.1 This submission has been prepared in support of an application for the 'Determination of New Planning Conditions' under the provisions of Section 96 of the Environment Act 1995. The Environmental Statement (ES) has been prepared in accordance with the Town and Country Planning (Environmental Impact Assessment) (England) Regulations 2017. It sets out baseline and background environmental information and also sets out the details of the development having regard to the location scale and nature of the proposals.

20.1.2 The ES identifies the likely significant impacts and the relevant national and development plan policies that will be used in the determination of the application. In this regard the proposal is considered to be compliant with the main planning policy tests set out in the development plan and advice set out in national planning policy.

20.1.3 The ES has considered the main potential negative environmental and local amenity effects of the proposal and has concluded that, subject to the imposition of the proposed scheduled conditions to secure appropriate mitigation measures, no unacceptably adverse or severe impacts will arise.

20.1.4 Rather, the proposed development would result in socio-economic benefits at a local level and, to a lesser extent, the wider region through multiplier effect. The overall contribution to the economy is not insignificant, jobs at the quarry shall be maintained for a long period of time and associated spin-off industries which rely of the quarry development will be sustained in the long term.

20.1.5 The Landscape and Visual Impact assessment concludes that the proposals will not result in significant adverse effects to Landscape Character. During the proposed operational period of Hindlow there will be a peak of 13 No significant adverse visual effects, occurring during Phase 2 of operations. Most sources of the adverse effects are present within the quarry's current baseline situation. At restoration there will be 13No adverse visual effects, however, none of these shall equate to *significant* adverse impacts. Overall, there shall be beneficial visual effects post restoration.

20.1.6 Hindlow Quarry is a permitted development which takes place over a long period of time. In respect of landscape and visual matters, it needs to be considered within this context. Even though it is assessed that there are currently and will be future significant adverse effects on landscape and visual receptors, the effects will be

reduced overtime. The effects predicted are not dissimilar to those currently experienced. The mitigation and restoration proposals embedded within the scheme will help integrate the development further into its setting in the long term. We consider that the continued development is acceptable and appropriate in Landscape and Visual terms, and in accordance with the identified landscape orientated designations and policies within Derbyshire.

20.1.7 The Ecological Assessment has concluded that the proposal is predicted to result in only negative impacts at site level. Following mitigation outlined within Chapter 8 of the ES these impacts would be negligible. There are no significant impacts to statutory or non-statutory sites as well as no unacceptable direct or indirect impacts to human health, biodiversity, land, soil, water, air and climate as well as the interaction between these in accordance with EIA regulations.

20.1.8 A Noise Management and Monitoring Protocol for Hindlow was approved in July 2017 and is currently implemented on site. This scheme shall remain in place on site in accordance with Condition 27 of the Initial 1998 Review of Minerals Permission. The Noise Assessment carried out to support this application found that with the appropriate mitigation measures site noise limits set out in Condition 27 shall not be exceeded.

20.1.9 The Air Quality Assessment identified the potential dust sources on site and outlined the mitigation required to minimise the impact at source. The potential dust receptors were also identified and the impact they would receive was analysed. None of these receptors will face more than a low risk / slight adverse effect.

20.1.10 In July 2017 a Blast Management and Monitoring Protocol was approved by the MPA, for conditions 32 and 33 of the Initial 1998 Review of Planning Permission. A number of residential receptors were identified as part of the Blasting Assessment. The proposed measures to control impacts of ground borne vibration and air overpressure will provide appropriate mitigation.

20.1.11 Low ground vibration levels accompanying very low air overpressure means there will be a safe level of impact, although this could possibly be perceptible at the closest receptor on occasion. Regarding impacts to rail line, during phases 1 and 2 a reduction charge is required at closest approach to rail line. Overall, following mitigation the blasting on site can be carried out in accordance with the current limits from existing Initial 1998 Review Planning Permission.

20.1.12 The presence of archaeological remains was assessed as part of an Archaeological Assessment carried out as part of the application. It identified 19 known archaeological remains within the ROMP application area. Of these identified, it is known that some have been lost or destroyed by previous quarrying activities and some have not been located within the landscape. Therefore, it was concluded that the magnitude of change from the development would be 'no change' and the impact as 'Neutral'.

20.1.13 Mitigation has been suggested within Chapter 12 of this ES and the reports located in ES Volume 2 Technical Appendix F. An updated condition has been suggested as part of the ROMP to ensure a Written Scheme of Investigation for archaeological work is formulated prior to extraction on undistributed areas.

20.1.14 As the site is over 1Ha a Flood Risk Assessment is required. The risk of flooding on site is very low to negligible. Surface water run off south of the rail line will travel into the mineral void and be contained by the void / infiltrate the limestone bedrock. North of the rail line surface water run-off will be managed by swales constructed around the perimeter toe of soil and mineral stocks. Post restoration will return the north of the rail line to existing conditions and south of the rail line water will equilibrate with the water table.

20.1.15 Groundwater flow responds to seasonal changes in rainfall. The groundwater flow from Hindlow is likely to discharge at the River Wye and River Lathkill predominantly. As the quarry working will remain above the water table during Phases 1 and 2 there will be no impacts to sensitive groundwater receptors in these phases. It was concluded within the Hydrogeological Impact Assessment that a new condition is proposed to agree a dewatering scheme with the MPA prior to working below the water table.

20.1.16 In terms of transportation, records from the previous three years show two way hourly movements of 5, this is predicted to remain the same with the recommencement of mineral extraction. The bulk of the mineral will be transported off site by rail using the existing rail infrastructure on site. The rail exports from site will increase from 130 in 2020 to ~1400. This has environmental benefits over road transport as rail freight produces only 53% of the greenhouse gas emissions of transporting by HGV per vehicle per kilometre. On a tonne for tonne basis, rail movement produces 70% less CO2 than road, fifteen times lower NOx emission and almost 90% lower PM_{10} emission

as concluded within a Sustainable Transport study conducted by the Department for Transport in 2008.

20.1.17 Given the context and the proposed frequency of rail movements off-site, and there being no substantive increase to frequency of HGV movements, no additional mitigation would be warranted.

20.1.18 The working of the quarry will eventually see all land removed from agricultural use. The loss of this land is seen as negligible impact as 86% of land is Grade 4 and the remaining 14% is Non-agricultural. Mitigation for loss or damage of soil resources requires adoption of a Soil Management Plan which can facilitate the protection of all soil resources on site and ensure mitigation of impact to negligible.

20.1.19 There are several Public Rights of Way (PROW) surrounding the site and there are three which pass within it, these being HP14/7/1, HP14/8/1 and HP4/8/1. As part of Phase 1 these PROW shall be diverted to follow the boundary of north western boundary of Hindlow Quarry with Brierlow. South of the rail line there will be a safety fence separating the diverted PROW from the operational area. The diverted areas of these PROW will become permanent due to the proposed phasing and potential impacts regarding amenity of users of these PROW will be mitigated to the highest standard.

20.1.20 Addressing the impacts of climate change is a key part of the applicants ethos and they are fully committed to helping meet the government goal of UK ambition of net-zero carbon emissions by 2050. Regarding the sites effect on climate change, the proposed development and operations are an appropriate use for the site. The operations will not have unacceptable direct or indirect impacts.

20.1.21 In terms of the meeting the challenge of climate change, the proposed development and operations will not have unacceptable direct or indirect impact on population and human health; biodiversity; land, soil, water, air and climate; material assets, the landscape; or the interaction between these factors in accordance with EIA regulations.

20.1.22 The cumulative impact of the scheme has been assessed with regard to the neighbouring quarries of Dowlow and Brierlow. There are no cumulative impacts that will arise from the scheme that would be deemed unacceptable.

20.1.23 In overall conclusion, it is considered that the proposals provide an environmentally acceptable scheme that supports the economic, social and environmental roles of sustainable development required in NPPF. Where adverse impacts do arise, they are not significant and appropriate mitigation can be promoted that will be capable of further reducing the effects of any such impact. All mitigation can be formalised as appropriate through the imposition of the proposed planning conditions. The potential environmental and local amenity impacts are therefore considered acceptable, and the proposal accords with Development Plan policy.

20.1.24 Where proposals conform with the definition of sustainable development in NPPF and comply with Section 38(6) of the Planning and Compulsory Purchase Act 2004 (i.e. that have regard to the development plan) NPPF paragraph 14 advises that it is national level policy that the golden thread running through decision taking means that such development proposals should be approved without delay.