



# Fullamoor Quarry

Environmental Statement Non-Technical Summary



# Contents

<b>1</b>	<b>Introduction</b>	<b>3</b>
<b>2</b>	<b>The Site and Development Proposals</b>	<b>4</b>
	Site and Surroundings	4
	Development Proposal	5
<b>3</b>	<b>Main Environmental Statement Findings</b>	<b>9</b>
	Traffic	9
	Ground and Surface Water (Hydrogeology)	10
	Flooding	11
	Cultural Heritage	12
	Agriculture	14
	Bird Strike	14
	Landscape	15
	Noise	16
	Biodiversity	17
	Geology	18
	Air Quality (including dust)	18
	Alternatives	19
	Climate Change	19
	Socio Economic Impacts	19
<b>4</b>	<b>Conclusions</b>	<b>20</b>

## Notice

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### Contact Details:



Author: Lucy Binnie

email: lb@landandmineral.co.uk

Web: www.landandmineral.co.uk

# 1. Introduction

**1.1** This document is the Non-Technical Summary of the Environmental Statement (NTS) prepared to accompany the planning application for a new quarry (Fullamoor Quarry) in South Oxfordshire by Hills Quarry Products Limited, the Applicant.

**1.2** An Environmental Impact Assessment (EIA) is an assessment of the potential environmental impacts of the development. The findings of that EIA exercise are required to be presented in a separate Environmental Statement (ES) document.

**1.3** The requirement for an EIA is derived from European legislation, translated in the UK into the Town and Country Planning (Environmental Impact Assessment) Regulations 2011. The 2011 Regulations and accompanying guidance require the ES to have a Non-Technical Summary.

**1.4** The Non-Technical Summary is a stand-alone document. It provides a brief summary of the development and the results of the EIA research and technical papers developed in the Environmental Assessment in non-technical language.

**1.5** At the start of the EIA exercise the original proposal for Fullamoor Quarry covered an application area of over 160 hectares of land, working sand and gravel reserves of nearly 5 million tonnes with restoration to agriculture, nature conservation and recreational facilities including a 1,000m rowing lake and marina facility. The restoration would be completed using imported backfill inert materials and the development would have an operational life of 25 years.

**1.6** The final proposals have been shaped by an iterative process and reflect the specialist technical assessments of the EIA work, changes in the locality such as the designation of a Scheduled Monument and on-going consultation with the local community and stakeholders. The iterative approach in bringing forward the development proposals has not only changed the area to be worked, but also informed the nature of the proposed operations and restoration. The proposal is significantly different with a reduced area of 104 hectares containing reserves of 2.5 million tonnes of sand and gravel. The restoration proposals are for agriculture, nature conservation and limited low key recreational use (omitting the rowing facility and marina). The proposal no longer includes the importation of inert materials and has an operational life of 10 years bringing forward the completed final restoration landscape date.

## 2. The Site and Development Proposals

### Site and Surroundings

**2.1** The site is in South Oxfordshire approximately 3 kilometres south east of Abingdon. It lies between the A415 and the River Thames just south of the Culham Science Park and west of the village of Clifton Hampden. It comprises mainly agricultural land and the surrounding land uses include agriculture, industrial development and scattered villages, see figure 1 below.



Figure 1: Location of Site

**2.2** No nature conservation designations affect the site or are in the immediate vicinity. A Scheduled Monument known as Fullamoor Plantation, a round barrow cemetery, lies to the west of the site just clipping the western side of the application site. The Thames Path lies to the south of the site and part of the site lies in the flood plain of the River Thames.

## Development Proposal

### 2.3 The proposal is for:

*The extraction of sand, gravel and clay from land at Fullamoor including the provision of a new access, processing plant, offices with welfare accommodation, weighbridge, concrete plant and silt water lagoon system followed by restoration to agriculture and nature conservation including lakes with recreational afteruses and the permanent diversion of footpath 171/15 and creation of new footpaths.*

**2.4** The site covers just over 104 hectares with proposed mineral extraction over 76 hectares. The site contains sand and gravel reserves of approximately 2.5 million tonnes and will have an operational life of 10 years working at a rate of 250,000 tonnes per annum, of which approximately 30,000 tonnes will be used in the site's concrete plant. The development will generate traffic of 570 heavy goods vehicle (HGV) movements per week, a 'movement' being a HGV travelling either into or out of the site.

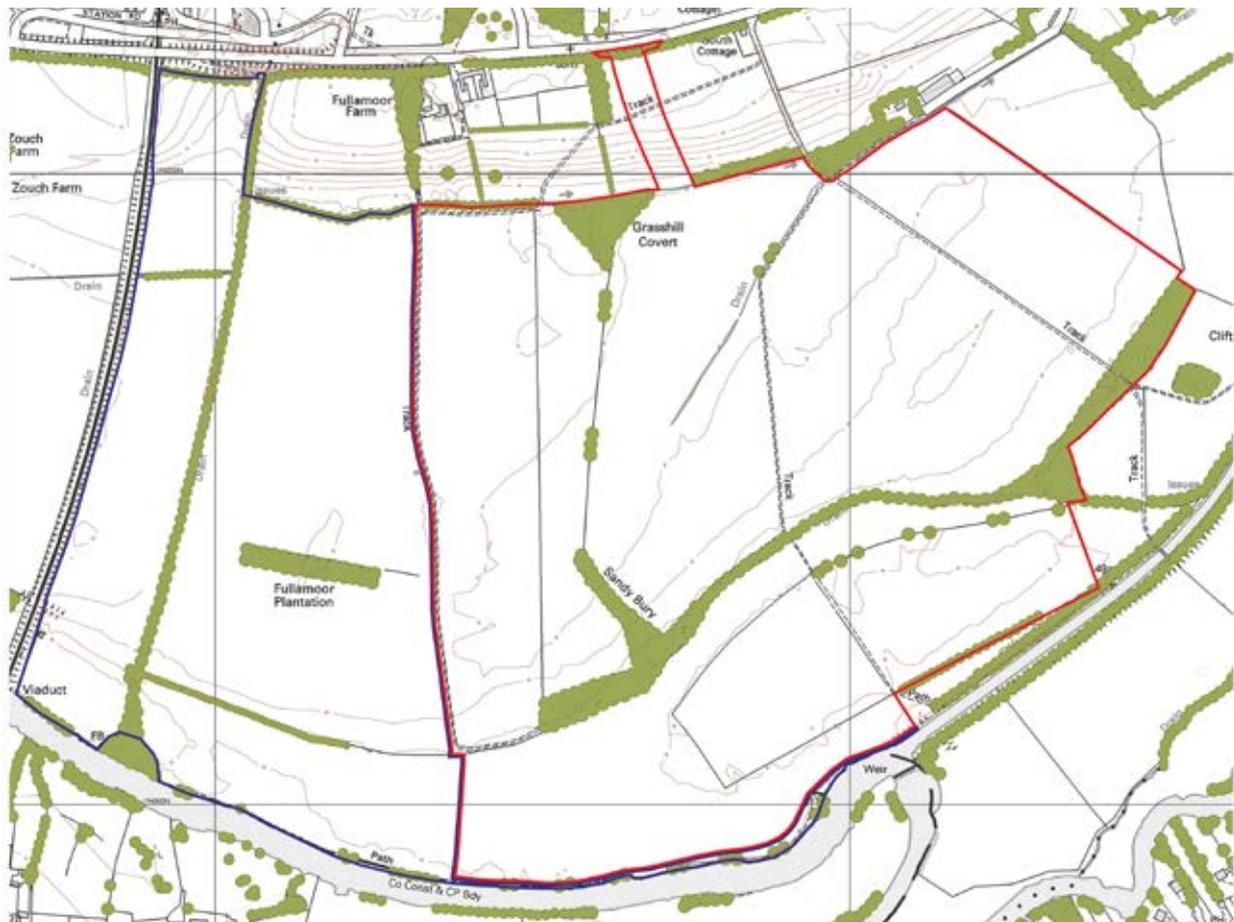


Figure 2: The Application Area

#### LEGEND

-  Existing woodland, hedge and tree
-  Planning Application area
-  Other land under control of the Applicant

**2.5** The working scheme has ten phases with the final, tenth phase working the sand and gravel under the plant site after it has been dismantled. Working will commence in the top northwest corner and work in a generally anticlockwise direction, see figure 3.

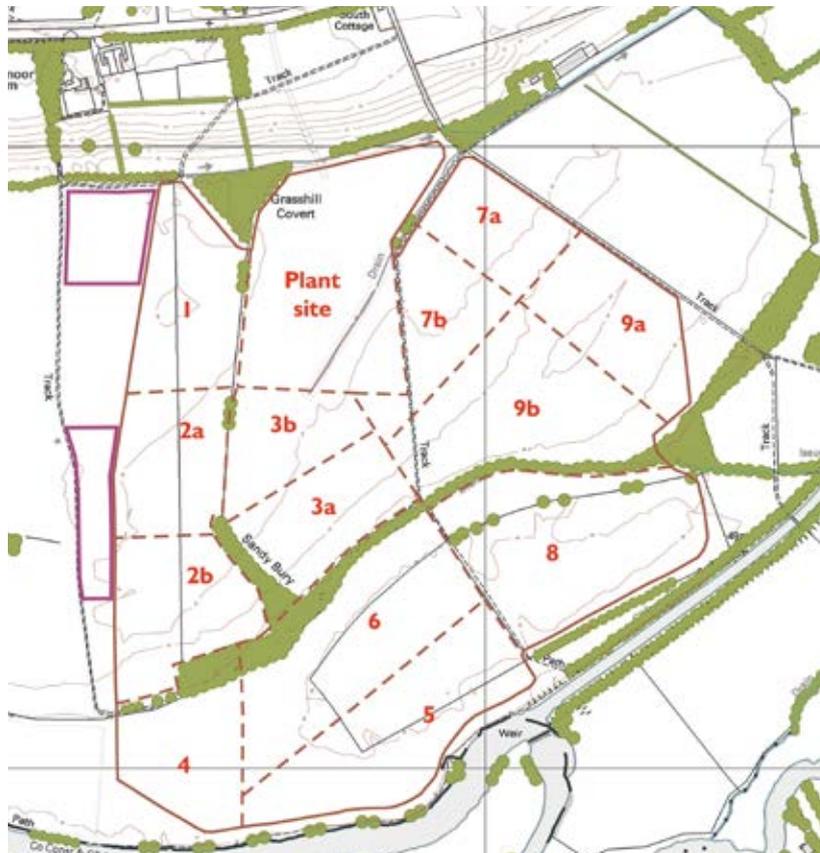


Figure 3: Working Scheme

**LEGEND**

-  Existing woodland, hedge and tree
-  Extraction boundary

-  Working phase boundary
-  Main topsoil and overburden storage area
-  Working phase

**2.6** The sand and gravel will be extracted using a wheeled loading shovel and transported by a field conveyor system to the plant site for washing and processing. Before sand and gravel extraction can commence the topsoil, subsoil and overburden will be stripped from the excavation and operational areas. These materials will either be:

- used in amenity bunding round the plant site and phase 7;
- stored on the western side of the site just outside the excavation area; or,
- used in the progressive restoration of worked out areas.

**2.7** As there is a high water table across the site, to allow the sand and gravel to be worked 'dry', ground water will be pumped out to a central lagoon area where any sediment will settle into the bottom of the lagoon leaving clean water to be discharged back to a surface water ditch taking the water away from the site.

**2.8** Some of the clay below the sand and gravel will also be removed, not for sale or to be taken off-site but to provide material:

- to seal the western and southern excavation faces to assist with groundwater management during working and restoration; and,
- to be used in restoration works.

**2.9** A network of groundwater monitoring points will be installed and operate throughout the site's working life.

**2.10** A new site access will be constructed onto the A415 to the north. No highway improvements are required by the development but the Applicant proposes to contribute funds for highway verge improvements at Clifton Hampden. The Applicant also proposes a routeing agreement to keep HGVs from unsuitable local roads.

**2.11** The proposed plant site is located at the development's northern end close to the new site access. The plant site will have a sand and gravel washing plant and concrete plant, a clean water lagoon, weighbridge, stock piling and product handling areas and an office and welfare building. Amenity bunding will surround the plant site on its west, north and east sides to provide visual and acoustic attenuation. Water settlement lagoons will be provided to the west and east of the plant site, see figure 4.

**2.12** The development will provide direct employment for 5 site operatives and 10 HGV drivers. The sand and gravel will supply local markets and the rationale for the development is to supply construction materials needed for the major economic growth planned for the area including the expansion of Culham Science Park, major housing proposals, particularly in Didcot, and infrastructure projects including new relief roads. These projects will be more sustainably constructed using local materials rather than relying upon sea-dredged aggregate being transported from Southampton, or gravels from Buckinghamshire or the Cotswold Water Park in Gloucestershire and Wiltshire, or crushed limestone from the Mendip Hills which are currently the sources of raw construction materials used in the south of Oxfordshire.

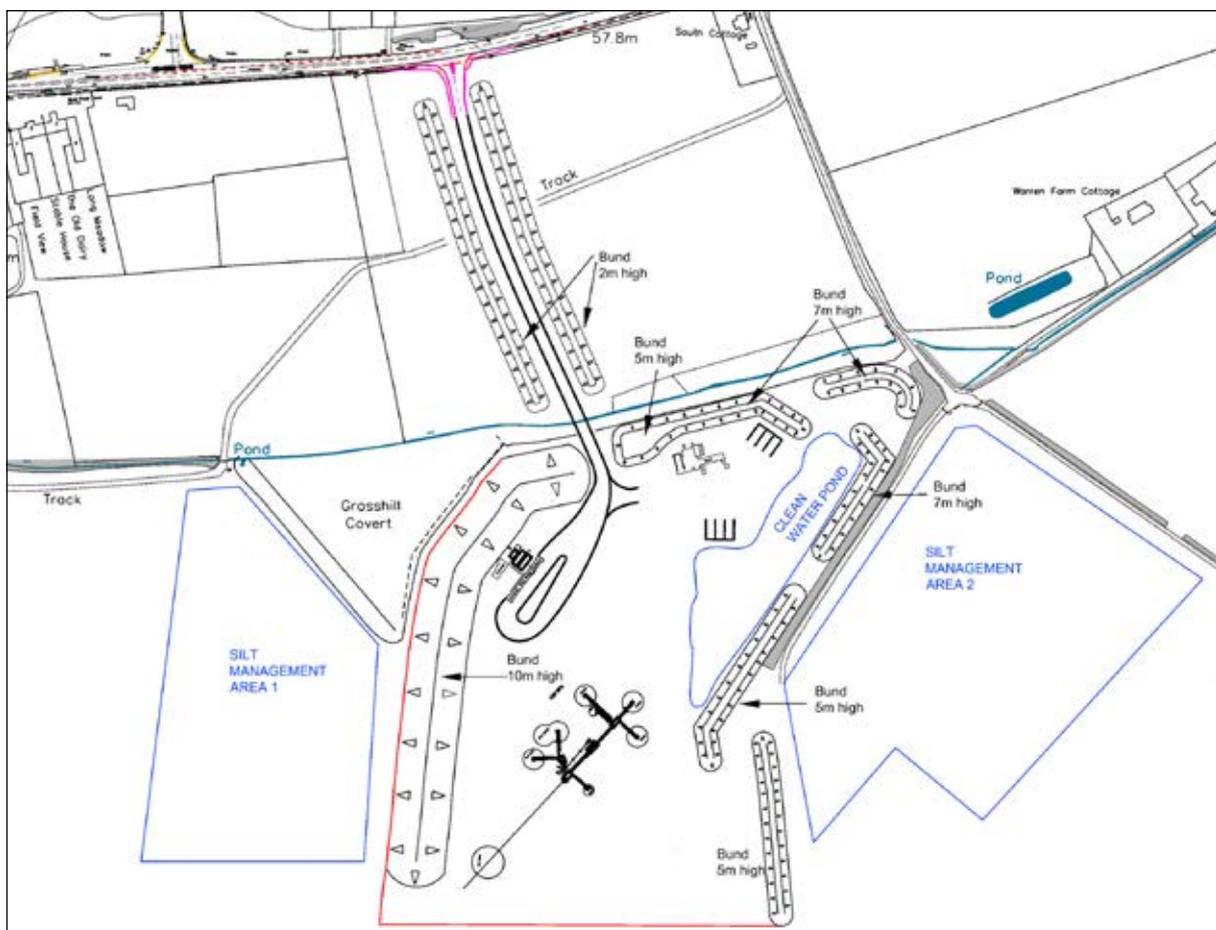


Figure 4: Plant Site Layout

**2.13** The site will be progressively restored to minimise the area of open quarry at any one time. Restoration will only use on-site materials (in other words, no other additional materials will be brought onto the site). The site will be restored to a combination of agricultural land and new flora and fauna habitat areas comprising:

- 41.8 hectares of agricultural land;
- 9.9 hectares of deciduous woodland;
- 14.8 hectares of lowland meadow;
- 6.6 hectares of reed-marsh progressing to wet woodland;
- 6.7 hectares of reed-marsh lake margins; and,
- 24.5 hectares of open water.

**2.14** The proposals provide for a low key restoration use of the southern lake (such as sailing or fishing). The new site access onto the A415 will be retained to provide future safe public access and a track will lead from this access to a small car park at the edge of the lake.

**2.15** The Applicant proposes to make provision via a legal agreement to secure, upon restoration, the:

- creation of new additional footpaths (circa an additional 2.8km);
- extended 20 years aftercare management for new habitat areas; and,
- bird management to reduce bird strike hazard for aircraft.

**2.16** A photomontage of the restored landscape is provided below.



## 3. Main Environmental Statement Findings

### Traffic

**3.1** The EIA work has included consideration of a Transport Assessment with details on traffic count information, accident records, traffic data analysis including applying growth factors to predict future traffic levels and the development likely to happen in the area during the site's life.

**3.2** The site is accessed via the A415, a HGV route designated by Oxfordshire County Council. The A415 connects to the A34 to the west, travelling through the centre of Abingdon. Travelling east on the A415 the road goes through Clifton Hampden and Burcot to join the A4074 which leads to Oxford. Just to the west of the site is the entrance for Culham Science Park, a major employer and traffic generator. There are regular bus services along the A415 and Culham railway station lies 800m from the site.

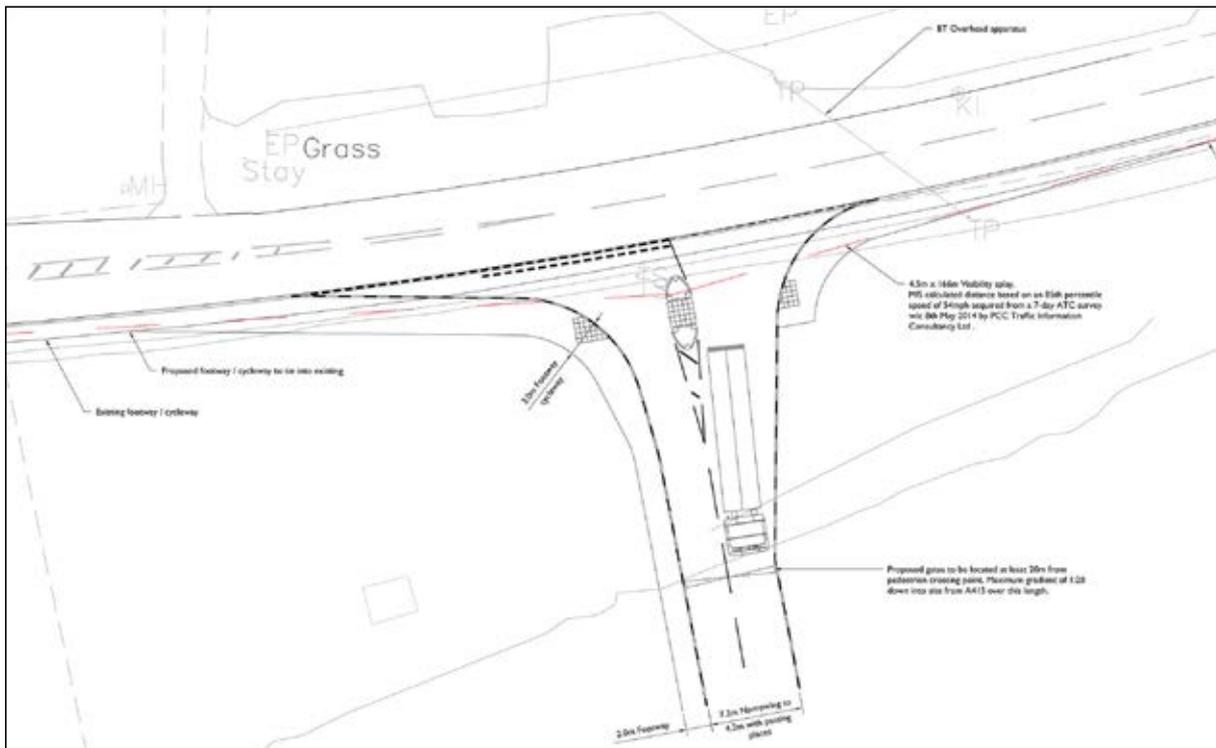


Figure 5: Site Access

**3.3** The new, purpose designed entrance onto the the A415 has been subject to an independent road safety audit. During its ten year working life the site will generate 570 HGV movements (counting both in and out separately) per five and a half day working week, rounded up to an average of 10 HGV movements per hour. This equates to 1 lorry leaving and 1 lorry returning to the site every twelve minutes. In practice it is expected that lorries will avoid using the roads at peak "rush-hour" times. The traffic generation of the development has been assessed against the existing traffic flows and carrying capacity of the road and it has been determined that the additional traffic will not have any discernible impact on environmental parameters in terms of vibration; severance and pedestrian delay; driver stress; pedestrian amenity; fear and intimidation; road surface wear and tear and, accidents and safety.

**3.4** The Applicant proposes a routing agreement to reduce vehicle impacts on the wider road network and to prevent its vehicles travelling on unsuitable local roads. Although negligible impacts have been assessed the Applicant is also proposing a financial contribution to highway improvement works at Clifton Hampden in response to public consultation comments.

## Ground and Surface Water (Hydrogeology)

**3.5** The site is set in a river valley and the proposal involves pumping water (dewatering) out of the working areas to aid efficient recovery of the sand and gravel and to undertake reinstatement works. To assess the impact of the proposal on ground and surface waters, at both the working and restoration stages, the EIA has assessed the baseline water environment conditions including reviewing geological information, weather (rainfall) records, monitoring surface and groundwater levels, analysing water quality, establishing rates of groundwater movement, discussions with the Environment Agency (EA) and hydraulic modelling.

**3.6** The River Thames is the main surface water feature to the south of the site and several surface water ditches run across the site in a general west to east direction into the River Thames. Two aquifers lie beneath the site although there is poor continuity between them. Groundwater lies between 1m and 3m below ground levels and flows across the site, north to south, towards the River Thames. There are a number of licensed water abstraction points, for agricultural or energy purposes, and also private water wells in the locality.

**3.7** To mitigate changes to ground and surface waters certain measures are proposed which include:

- discharging pumped water to surface watercourses to maintain their flows;
- operating in line with pollution prevention guidance;
- settlement of site waters to maintain quality prior to discharge;
- use of clay sealing and “weepers” (natural, controlled outfall systems) on western and southern excavation faces;
- provision of land drains to restored agricultural land;
- management of lake water levels upon restoration; and,
- returning restored ground to levels no higher than original levels and maintaining a ridge feature across the site, west to east for future natural drainage.

**3.8** Water monitoring will take place for the duration of the development to ensure the effectiveness of the mitigation measures.

Photo: Water monitoring



**3.9** The development, during its working life, will have a low or negligible impact on any private water supply or abstraction points given the limits of the draw-down caused by the site's water pumping and the distance between the abstraction points. No significant impact was identified on the River Thames or the ditches crossing the site. The impact on the ground water resource in the aquifer which flows into the River Thames was assessed as not significant because of the transfer of the discharge waters to surface water features. However the technical work did recommend clay sealing the southern working face beside the River Thames to limit the amount of water flowing into the workings and so reduce the amount of water to be 'managed' ie, to be pumped out. The possible impacts of dewatering leading to subsidence on the nearby railway embankment have been investigated but identified as negligible although the research suggests the use of clay seals on the western working faces as a precautionary measure. No water quality issues were identified because the development includes mitigation with the provision of settlement lagoon systems and pollution prevention measures to maintain water quality.

**3.10** The research confirmed that the backfilling of parts of the site with the indigenous soil and overburden could increase groundwater levels and recommended that, upon restoration, the clay seal on the western boundary should have gravel weepers (in situ blocks of sand and gravel left unworked) to allow the free flow of groundwater and limit any unnatural rise in groundwater to the west of the site. Land drains are also recommended on the areas returned to agriculture to address potential waterlogging. With these mitigation measures no significant impact is anticipated. The restored site will have lakes that will have controlled outlets to maintain appropriate lake levels.

**3.11** The technical work concluded that the development would not compromise the European Union Water Framework Directive which seeks to preserve, restore and improve the water environment. No cumulative impacts were identified, with the River Thames providing a hydraulic boundary to quarry areas to the south of the river.

## Flooding

**3.12** The site lies partly in the floodplain of the River Thames with a secondary floodplain covering an area of the site to the north. The site was affected by the 2014 floods and the southern part of the site can be prone to flooding during the winter months.

**3.13** A Flood Risk Assessment (FRA) was undertaken as part of the EIA work and to accompany the planning application submission. The FRA is an objective assessment of the development's impacts on flooding during the working and restoration stages, both on and in the locality of the site. The FRA undertook a computer modelling exercise of flood flows which included an allowance for increased flood levels to take account of climate change. The parameters of the modelling were first agreed with the Environment Agency. Different types of flooding were considered including river, groundwater, surface and drainage flooding.

**3.14** The flood mitigation measures to be operated during the site's working life include: keeping storage of soils out of the floodplain as best as possible; designing amenity bunding to allow passage of flood flows; maintenance of a ridge of higher ground to prevent the two floodplains merging and creating scalloped areas to the east of the plant site for flood storage purposes. Once restored the site's mitigation measures will include: management of lake water levels to aid flood water storage; natural or artificial drainage of the agricultural land; gravel weepers around the finished excavation edges to prevent groundwater build-up; restoring the higher ridge of ground and, designing the restored ground levels to be no higher than the original ground levels.

**3.15** The properties around the site will not, with the operation of the mitigation measures, be affected by increased water levels as a result of the development and indeed will see a small betterment with a very slight reduction in flood flows, typically a change of -0.01m, during the working stage. A small, potential increase in flooding to agricultural land around the site was assessed to have a low impact which was not significant. There is no loss of flood water storage caused by the development and with the restored lakes there is the creation of additional flood storage.

## Cultural Heritage

**3.16** The ES has studied the historic environment of the site examining existing literature, maps and records, and reviewed the results of fieldwork investigations including a geophysical survey and archaeological trial trenching to assess the impact of the development on the cultural heritage resource.

**3.17** There are a number of nationally important Scheduled Monuments in the locality which, whilst without any above ground elements, represent part of the prehistoric landscape of the River Thames. Notably, Fullamoor Plantation Scheduled Monument, the buried remains of an Early Bronze Age Barrow cemetery, has a slight overlap with the site. Other Scheduled Monuments found in the locality include areas of prehistoric settlements or funerary activity and an Iron Age hill fort and enclosures. There are some buried archaeological remains known within the site. The known deposits mostly relate to a small area of settlement of later Iron Age and Romano-British date concentrated in the southern part of the site. Elsewhere, isolated finds of earlier prehistoric activity have been recorded. Whilst these remains are known to be present they are not considered rare enough or well-preserved enough to be of national importance and are, therefore, not protected.

**3.18** Clifton Hampden is thought to date back to Saxon times and is a conservation area along with the surrounding villages of Long Wittenham and Appleford. The majority of the listed buildings in the area are likely to originate in the Saxon period, some 1,500 years ago.

Photo: Archaeological investigations



**3.19** The Fullamoor Plantation Scheduled Monument was designated following archaeological investigations commissioned by the Applicant as part of the initial site works. The results of the archaeological excavations provided new information about the below ground archaeology and deemed significantly important to be protected as a Scheduled Monument. As a result the Applicant revised the site boundary to exclude this area from working and there is only a small overlap of the site boundary with the Monument into crossing into an area which will only be used for storage of soils.

**3.20** The physical integrity of protected buried archaeology will not be changed by the quarry workings as there will be an exclusion zone around it. However, there will be a minor adverse change to its physical surroundings during the life of the quarry. This change will be temporary and resolve itself once the quarry and the landscape are restored with no lasting impact to the significance of the Scheduled Monument. The physical surroundings of the conservation area at Clifton Hampden and some of its listed buildings, has also been considered. However, on the basis that there are no meaningful visual links to the site, the quarry will only result in a temporary change to the wider landscape which would resolve upon the closure of the quarry and the restoration of the landscape.

**3.21** The buried archaeological remains within the site will be subject to a mitigation strategy with a programme of archaeological recording across the site proposed. The scope of this work is to be agreed in consultation with the County Archaeologist. Whilst the loss of the archaeological deposits within the site can never be completely mitigated the overall residual effect would be reduced to one of minor significance with completion of the recording and the publication of the results of the archaeological excavation. In addition, there would be opportunities for the general public to visit the excavations whilst they are in progress and learn more about the archaeological development of the landscape, including the Scheduled Monument at Fullamoor Plantation, through the provision of interpretive panels positioned at key locations within the final restored landscape.



Photo: Fossil find at a public quarry site visit

## Agriculture

**3.22** The majority of the site is currently in agricultural use and the EIA assesses how the proposal will impact agricultural operations and soils. Survey work was carried out with 73 soil profiles examined and classified into agricultural land value grades. The site was found to have 17.6 hectares of grade 2 land, 31.4 hectares of grade 3a land, 50.6 hectares of grade 3b land and 4.7 hectares of non-agricultural land. The land is farmed between two different farm holdings. The development impacts relate to firstly, soils resources and secondly, the potential impact on the viability of the farm holdings as a result of the loss of agricultural land.

**3.23** The mitigation measures include careful soils handling, storage and placement; following MAFF good practice guides, and following a 5 year management regime to ensure the restored agricultural land is cultivated appropriately, including addressing remedial actions if necessary. The correct management of the soils resources in restoration, as is usually achieved by the quarrying industry which has considerable expertise in this regard, will ensure that the agricultural land is restored to the highest possible standard with only minor residual adverse impact on the soils resource. The development will however result in the net loss of 10 hectares of the higher grades of agricultural land, but the impact on the farm holdings which benefit from extensive areas of other agricultural land elsewhere, is deemed to be low with only a minor residual adverse impact.



Photo: Example of land restored to agricultural use

## Bird Strike

**3.24** The site is located 9.5km northwest of RAF Benson and lies in the safeguarding zone of the airfield and the EIA has included an assessment of potential bird strike. The assessment considered bird survey information, the habitats around the site and the restoration proposals which have an emphasis on nature conservation.

**3.25** Examining the location of the site in relation to RAF Benson and assessing bird survey information and reviewing other waterbodies and the proximity of the River Thames, the bird strike risk is assessed as low. Mitigation is proposed to reduce the restored site's attractiveness to high risk 'strike' species (i.e. the larger species such as geese and swans) through the design of lake edges, covering water depths, bank profiles and planting, restricting access to the water for feeding and discouraging nesting. The Applicant will operate a Bird Management Plan to manage bird species with dispersal of birds, prevention of roosts and other measures to discourage these strike species. The Bird Management Plan will be maintained whilst RAF Benson remains an active air base and will be agreed with the Defence Infrastructure Organisation.

## Landscape

**3.26** The EIA has looked at the potential landscape and visual impacts of the development both during the working and restoration stages following the 'Guidelines for Landscape and Visual Impact Assessment' from the Institute of Environmental Management and Assessment and the Landscape Institute (3rd Edition). The effects relate to changes made by the development on the landscape as a resource; whereas the visual effects relate to changes to views and resulting visual amenity of residents and visitors. The assessment work included reviewing existing records, plans, site inspection and modelling.

**3.27** The landscape is not subject to any formal landscape designations and is comprised of a number of different landscape types. Assessing the overall value of these, the area by the River Thames, the River Meadowlands Lower River Thames, is considered to have the highest 'medium to high' value whereas to the north, the Vale Farmland where Culham Science Park is located, is considered to have a 'low' value. The unmitigated impact of the working stage on these landscapes ranges from 'major adverse', to 'negligible'. However, the proposed mitigation measures will reduce the working stage impacts to 'moderate adverse'. The assessment acknowledges that this impact is temporary and changes to 'minor beneficial' for the River Thames upon maturing of the restored site.

**3.28** There are a number of designated landscapes in the locality, including the North Wessex Downs AONB and Nuneham Park and Gardens. However, as they are not clearly inter-visible with the site nor interact with it in any significant way the effects on designated landscapes are judged to be negligible.

**3.29** The mitigation measures being proposed include: location of the plant site beside the woodland of Grasshill Covert where the land begins to rise to take advantage of both topography and the woodland screening potential; use of amenity bunding around the site and the plant site; reinforcement and maintenance of boundary vegetation; planning of the working phases to retain on site vegetation for as long as possible; and, progressive tree planting and restoration works. The mitigation measures upon restoration are designed to enhance and compliment the riverside environment of the River Thames, introducing new water bodies with extensive new planting which, overall, will increase the amount of trees, hedgerows and shrubs across the site, new footpaths and long term management of the landscape.

Photo: Low level concrete plant



**3.30** The visual assessment concluded that the site has a small zone of visual influence being well contained in the landscape. Visual receptors, i.e. viewpoints where the site can potentially be seen from, were identified with the key receptors being the footpath between Clifton Hampden and the site, the Thames Path and the properties to the north of the site, south of the A415. The unmitigated effect of the workings, i.e. the worst case scenario, on the properties to the north ranged from 'moderate adverse' at Fullamoor House and Fullamoor Barns, to 'minor adverse' at South Cottage. The mitigation measures reduce the working impact at Fullamoor House and Barns to 'minor adverse', which will only be for a temporary period during working, with a 'negligible' impact upon maturing of the restoration.

**3.31** Short lengths of footpaths, including the Thames Path, are adjacent to the workings, for these the mitigated impact during working on the footpath users are assessed as potentially 'major adverse' and 'medium adverse' changing to 'minor beneficial' or 'negligible' upon maturing of the restoration.

## Noise

**3.32** Background noise levels were measured at a number of locations around the site and the results used to assess the increase in noise levels that would be generated by the development. The noise monitoring identified background levels typically higher to the north of the site, along the A415, and quieter around the River Thames.

**3.33** The background levels were assessed against government guidelines for setting noise levels at mineral sites to present appropriate noise limits. The noise limits were compared to the predicted noise levels from the site's operations and for all but one, Warren Farm Cottage, were within these limits. To mitigate the noise levels at Warren Farm Cottage amenity bunding round the plant site is proposed.

**3.34** The noise assessment also examined the impact of traffic noise including possible cumulative impacts with other developments which, with the volume of existing traffic and proposed traffic levels, was classed as negligible.



Photo: Measuring noise levels

## Biodiversity

**3.35** An Ecological Impact Assessment (EclA) was undertaken as part of the EIA work to assess the impacts on flora and fauna affected by the development and address them with appropriate mitigation measures and identify enhancements for biodiversity. An extensive range of surveys were undertaken and information from the Thames Valley Environmental Records Centre and other sources reviewed.

**3.36** There are no international or national designated conservation areas within 2km of the site. A number of non-statutory, locally designated, wildlife areas are found around the site with Hayward's Eyot, Clifton Hampden Meadows, Clifton Hampden Wood and Furze Brake, between 300m and 1,300m from the site. The majority of the site, comprising managed agricultural land, was assessed to be of low ecological value. The main notable features were species rich hedgerows; small woodland plantations and the bank of the River Thames and these are all BAP<sup>1</sup> priority habitats. The wildlife habitat was also noted as limited, typically restricted to hedgerows, water habitat and woodland areas. BAP priority species with the potential to be affected by the development were identified as including bats, hedgehogs, hare and birds, and also badgers (not a BAP species but nationally protected).

**3.37** Potential negative impact, i.e. the impact without any mitigation, was assessed for the loss of features such as the hedgerows, Sandy Bury plantation and a small ditch/stream crossing the site, with a neutral impact on the River Thames and the Local Wildlife Sites. The only potential negative impact for species was on badgers with risks from reduction in foraging areas.

**3.38** The mitigation and enhancement measures include: ecological surveys to guide clearance works; timing of certain site works e.g. any removal of trees or hedgerows outside the bird breeding season; buffer to the River Thames; providing bat and owl boxes; best practice in terms of pollution control management at the site; control of lighting; use of appropriate native species in planting works; habitat management with an extended period of management of restored habitats and, an adaptive strategy of monitoring and management of the restored land. With these measures in place the residual ecological effect was considered to be positive during working with predicted ecological benefits potentially becoming significant with the new and restored habitats.

**3.39** All in all the site is considered to be ecologically poor following years of intensive farming and agricultural improvement. It is anticipated that any adverse impacts on bio-diversity can be mitigated and reduced and, overall, the expected enhancements will lead to a residual positive impact.

<sup>1</sup> BAP refers to Biodiversity Action Plan, which identifies habitats and species under threat and requiring conservation action.

## Geology

**3.40** A number of geological investigations of the reserves at Fullamoor have taken place to establish the nature and extent of the mineral deposit with exploratory drilling in 1990, 2004 and 2008 and trial pitting in 2014. The sand and gravel is a river terrace deposit known as the Northmoor sands and gravels. The site has a workable reserve of approximately 2.5 million tonnes with the sand and gravel deposit up to 4m deep. The sand and gravel has been tested and grading results confirm it as suitable for a range of aggregate products including its suitability for a concreting use.

## Air Quality (including dust)

**3.41** Mineral operations can generate dust from the extraction, processing, transportation and restoration operations. The EIA assessed air quality impacts of coarse dust to fine particles and vehicle emissions. Surveys to obtain the background dust levels were undertaken at locations to the north, east and south of the site. To assess vehicle emissions, modelling of the impacts in Abingdon, the centre of Abingdon has an Air Quality Management Area (AQMA - an area of poor air quality) were undertaken.

**3.42** The recorded current background dust levels corresponded with published average levels with the exception of the monitoring location to the east at Warren Farm Cottage which were thought to be caused through agricultural activities and use of a concrete track. The monitoring of fine particulate matter (known as PM10) at Fullamoor recorded levels in line with DEFRA background values for the area and the measurements were within the daily National Air Quality Strategy Objective for PM10.

**3.43** The potential impact of dust, coarse and fine, from the operations was assessed as low and, with mitigation, was assessed as insignificant. The assessment of impact of vehicle emissions was negligible for all but one receptor, the Old Magistrates Court in Abingdon, which experienced a slight adverse impact. However, the overall impact of the quarry traffic on local air quality was considered to be not significant.

Photo: Measuring dust levels



**3.44** The proposed dust mitigation measures relate to site management and sensitive control of vehicle movements and their speed, and the surfaces upon which they operate or minimising areas of bare ground or planting grass on soil stores. The dust management measures are to be incorporated into a dust management plan which will detail the site specific management operations to control dust as well as monitoring provision to ensure its on-going effectiveness.

## Alternatives

**3.45** The EIA has looked at alternatives for the development in terms of the site, working methods and supply options. Alternative sites have been considered over the years but none have presented themselves as a feasible option available for development. The preferred working option, of dry working, presents benefits in terms of reduced amenity impacts, better recovery of the sand and gravel resource and improved design of the restoration landform. Alternative supply options, such as the use of recycled material, have issues of supply themselves and are not suitable for high end aggregate use, such as in concrete, that the sand and gravel at Fullamoor Quarry can meet.

## Climate Change

**3.46** The potential impact of climate change has been addressed in consideration of the impacts of the development. Specifically when examining flooding the modelling has added 10% to 20% to rainfall levels. The resultant assessment confirms the development will not result in adverse flood impacts to receptors even if climate change increases rainfall levels to such an extent.

**3.47** The development has been designed to reduce impacts of greenhouse gases which contribute to climate change and its adverse effects. The development will balance a local source of supply of sand and gravel well located to supply the major developments planned for the surrounding area. As a result the reduction in transportation miles to provide construction materials in this area of Oxfordshire will actually reduce greenhouse gas emissions.

**3.48** The England Biodiversity Strategy Climate Change Adaptation Principles have been followed for the biodiversity impacts of the development to ensure the long term resilience of the restored habitats and associated species.

## Socio Economic Impacts

**3.49** The development proposals do not compromise the quality of life for the local community and actually benefits the community with significant new and increased biodiversity, new green infrastructure and recreational opportunities upon restoration. The proposals will also provide a beneficial impact in terms of employment, direct and indirect, as well as contributing to, and diversifying, the local economy. The proposal will provide construction materials to support the planned economic growth of the local area and reduce the cost of transporting construction materials to local construction projects which, it is hoped, will be passed down to the consumer, i.e. the house buyer or the Council Tax payer.

## 4. Conclusion

**4.1** The EIA presented in the Environmental Statement is a comprehensive assessment produced by independent, specialist technical consultants to examine the potential impacts of the development and propose the appropriate mitigation to reduce negative impacts.

**4.2** Across the assessments the majority of impacts, with mitigation measures, are of low, slight or negligible significance. The initial impacts on landscape does see a 'moderate adverse' impact for the River Thames albeit temporary and reverting to minor beneficial as the land is restored, but the residual visual and landscape impacts are generally 'minor beneficial'. Some of the visual impacts to properties at Fullamoor were assessed as 'minor adverse' after mitigation during the working stages but again are temporary impacts which will change to 'negligible' over time. A 'major adverse' and 'moderate adverse' impact has been assessed for the visual impact on footpath users during the working life of the site. However, this impact is temporary and changes to 'minor beneficial' upon maturing of the restored site.

**4.3** In conclusion the only identified significant adverse impact in EIA process is the temporary visual impact on footpath users.



Photo: Example of restoration to lakes



**Hills Quarry Products Limited**  
Wiltshire House, County Park Business Centre  
Shrivenham Road, Swindon SN1 2NR

[www.fullamoorquarry.co.uk](http://www.fullamoorquarry.co.uk)