Minerals Local Plan Site Options and Draft Policy Framework Evidence Paper

Minerals Technical Evidence

June 2014

Gloucestershire COUNTY COUNCIL
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1.0 Introduction & Policy Context

1.1 This technical evidence paper forms part of the evidence base intended to support the Gloucestershire Minerals Local Plan Site Options & Draft Policy Framework consultation. It contains details of the type of minerals produced in Gloucestershire.

1.2 Section 2 relates to aggregate production, but not the sales and reserves figures which are covered annually in the Local Aggregates Assessments\(^1\). Furthermore site-specific details are dealt with under a separate evidence paper (Site Options evidence paper).

1.3 Sections 3 to 5 deal with non-aggregate minerals produced in Gloucestershire including exploration for hydrocarbons.

1.4 All other environmental and planning issues including minerals restoration are covered in the companion evidence paper on Planning and Environment Considerations.

1.5 In addition to the draft policy framework within this document and the companion papers, a series of development management policies to limit the effects of minerals development will be required to use in the determination of minerals planning applications. These are also drafted and contained within the evidence paper on Planning and Environmental Considerations.

National Policy

1.6 National policy for minerals is set out in the National Planning Policy Framework (NPPF) that was published in March 2012. National Planning Practice Guidance (NPPG, March 2014) provides additional guidance on aggregates, coal and other hydrocarbons. Paragraph 157 of the NPPF requires local plans to be drawn up over an appropriate time scale, preferably a 15 year time horizon from adoption and to take account of longer term requirements.

NPPF

1.7 The NPPF requires MPAs to plan for a steady and adequate supply of minerals including aggregates and clay. It provides the policy mechanism for safeguarding mineral resources by the designation of Mineral safeguarding Areas (MSAs) and Mineral Consultation Areas (MCAs) and by encouraging prior extraction of minerals before other development, the presence of which would effectively sterilise the mineral resource. The policy also considers the use of alternative aggregates (secondary and recycled aggregates) and requires an assessment of the contribution that these could make to the supply of materials. The County Council’s approach to safeguarding is set out in

\(^1\) Available from http://www.gloucestershire.gov.uk/extra/article/115911/Local-Aggregates-Assessment
the accompanying consultation evidence paper on Minerals Safeguarding, which includes rail heads, wharfage and bulk handling facilities and sites for value added products such as concrete batching plant, coated stone plant and concrete products works as well as storage, handling and processing facilities for recycled and secondary materials.

1.8 The NPPF notes that the purpose of the planning system is to contribute towards the achievement of sustainable development and that this has an environmental role which aims to protect and enhance the natural, historic and built environment. The principles in the NPPF require Mineral Planning Authorities (MPAs) to plan for a steady and adequate supply of aggregates and to make provision for a landbank of at least 10 years for crushed rock and at least 7 years for sand and gravel but as far as is practical to provide for the maintenance of such landbanks from outside National Parks, the Broads, Areas of Outstanding Natural Beauty and World Heritage Sites, Scheduled Ancient Monuments and Conservation Areas. In preparing plans to meet development needs the aim should be to minimise pollution and other adverse effects on the local and natural environment and plans should allocate land with the least environmental or amenity value, where consistent with the other policies in this Framework.

1.9 With regards to clay, the NPPF requires MPAs to plan for a steady and adequate supply by providing a stock of permitted reserves for brick clay to support the level of actual and proposed investment required for new or existing plant and the maintenance and improvement of existing plant and equipment and to take account of the need for provision of brick clay from a number of different sources to enable appropriate blends to be made. Additionally, paragraph 147 requires MPAs to provide for coal producers to extract separately, and if necessary, stockpile, fireclay so that it remains available for use. Prior to the NPPF there was no separate, specific guidance for clay but guidance was included in Annex 2 to MPS 1 ‘Planning for Minerals’ November 2006 and a later detailed research report by the British Geological Survey (BGS) et al commissioned by the then Department of Transport, Local Government and the Regions (DTLR) had discussed the planning issues associated with brick clay extraction and processing. The recommendations of this report and the gist of Annex 2 have since largely been incorporated in the NPPF e.g. conservation of resources, sustainable and secure supply of brick clay, variety of clay sources and land banks.]

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2 NPPF Section 13 Facilitating the sustainable use of minerals  
3 NPPF Section 11 Conserving and enhancing the natural environment  
4 Brick Clay: Issues for Planning British Geological Survey
1.10 For the exploitation of fossil fuel minerals (coal, onshore oil and natural gas (methane) and unconventional hydrocarbons such as shale gas) and, in the case of gas, its storage underground, guidance is also now contained in the NPPF. However, specific practice guidance was also published for onshore oil and gas (includes shale gas and coalbed methane) but this has now been incorporated into the NPPG. Previous relevant policy guidance in MPG3: Coal Mining and Colliery Spoil Disposal (March 1999) and guidance on spoil tips in MPG5: Stability in Surface Workings and Tips (January 2000) has been replaced by the framework.

1.11 In 2006 policy guidance was published as an annex to Minerals Planning Statement 1. Annex 4 of MPS1, On Shore oil and gas and underground storage of gas, dealt with the conventional and unconventional hydrocarbons but with no specific mention of ‘fracking’, the controversial method of recovering shale gas, in particular, by hydraulically fracturing rocks to improve their permeability. It also set out guidance and information on the requirements for and effects of the phases of the development of conventional oil and gas and unconventional gas developments.

1.12 The NPPF also notes that the purpose of the planning system is to contribute towards the achievement of sustainable development and that this has an environmental role which aims to protect and enhance the natural, historic and built environment. One of the core principles in the NPPF is to conserve heritage assets appropriate to their significance: to deliver sustainable development good design that responds to local character and history and which reflects the identity of local surroundings and materials is also advocated. The supply of locally sourced and suitable natural building and roofing stone is vitally important to achieving this and the ongoing protection of the historic built heritage.

National planning policy for the exploitation of fossil fuel minerals

1.13 Unconventional hydrocarbons, known also as alternative fossil fuels, include coal mine methane (CMM) from active and abandoned coal mines; methane from virgin coal seams, known commonly as coalbed methane (CBM); methane recovered by hydraulic fracturing (‘fracking’) of shales and mudstones previously considered to be too impermeable for economic recovery of gas from them, and the recovery of ‘syngas’ by the combustion of underground coal seams in situ, known also as underground coal gasification (UCG).

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6 Essentially accumulations of gas (and sometimes oil) in rock formations with a low or ultra low permeability that has militated against recovery of the minerals but which, with ‘stimulation’, may become a commercial source of hydrocarbons.

6 Planning practice guidance for onshore oil and gas. DCLG July 2013

7 ‘Conventional’ hydrocarbons are recovered from a trapped porous rock reservoir into which they have migrated from a source rock; ‘unconventional’ hydrocarbons are recovered from impermeable rocks in which they have formed.

1.14 The NPPF has a presumption in favour of sustainable development and acknowledges that whilst minerals are essential to support sustainable economic growth its core planning principles support the transition to a low carbon future in a changing climate. Notwithstanding the requirement in paragraph 147 of the NPPF for MPAs to indicate any areas where coal extraction and disposal of colliery spoil may be acceptable, paragraph 149 specifically states that planning permission should not be given for coal extraction unless the proposal is environmentally acceptable, or can be made so by planning conditions or obligations; or if not, it provides national, local or community benefits which clearly outweigh the likely impacts to justify the grant of planning permission.

1.15 Paragraph 147 of the NPPF requires MPAs when planning for onshore oil and gas development, including unconventional hydrocarbons, to distinguish between the three phases of development; exploration, appraisal and production, and to address constraints on production and processing within areas that are licensed for oil and gas exploration or production. It also encourages the capture and use of methane from coal mines in active and abandoned coalfields and the safe storage underground of gas and carbon and associated infrastructure if geological circumstances are favourable. Paragraph 148 requires MPAs when determining planning applications to ensure that the integrity and safety of underground storage facilities are appropriate.

*NPPG Planning for hydrocarbon extraction (March 2014)*

1.16 This guidance expands on the NPPF and provides a commentary on the way in which Mineral Planning Authorities (MPAs) should account for hydrocarbons in Minerals Local Plans (MLPs) and on the range of planning matters that are relevant to their consideration of planning applications or other proposals for the three phases of hydrocarbon extraction (exploration; appraisal and production) and the overlap with planning by other regulatory systems. In this regard, MPAs are expected to include policies for each of the three phases of development in their MLPs. The guidance focuses primarily on matters pertaining to development management, including planning conditions, but in respect of MLPs it advises that whilst existing hydrocarbon extraction sites should be identified, along with any specific location for onshore oil and gas that the industry may wish to promote, there is normally no need to create mineral safeguarding areas for hydrocarbons.

*NPPG Planning for Aggregates*

1.17 This additional guidance followed on from the NPPF in March 2014 and elaborates on the NPPF. It underpins the government’s policy approach to the supply of aggregates and addresses the imbalances in supply and demand aggregates. Government expects resource poor areas to make some contribution to meeting local and national needs where that can be done sustainably.
1.18 The Managed Aggregate Supply System (MASS) guidance requires MPAs to make a forecast of demand for aggregates based on the average of 10 years sales data and other relevant local information. This Local Aggregates Assessment (LAA) is then used to assess if permitted reserves will be sufficient for future production and if a shortage is identified how this will be addressed. Using this data an assessment can be made of the size of any landbank and its compatibility with the governments expected landbanks. The NPPF requires MPAs to plan for a steady and adequate supply of aggregates by making provision for land won aggregates and other elements of their LAA in their mineral plan and that such provision should take the form of specific sites, preferred areas and/or areas of search and locational criteria as appropriate\(^9\). The first LAA for Gloucestershire was published in December 2013 and is supported by a detailed baseline report. This LAA covers the sales figures run from 2002 – 2011. The second LAA for Gloucestershire is also produced as part of the evidence base to this plan and includes the sales figures from 2003 – 2012. It also incorporates any updates to relevant parts of the baseline report information. This paper is developed from the information, data and assessment made in the first and the second LAA and the original baseline information incorporating data up to 2012.

1.19 The Introduction to the MASS guidance notes that “the underpinning concept behind the Managed Aggregates Supply System is that Mineral Planning Authorities which have adequate resources of aggregates make an appropriate contribution to national as well as local supply, while making due allowance for the need to reduce environmental damage to an acceptable level”. This is reiterated in Local Aggregates Assessment guidance where it is stated that “the Government is clear that every MPA with mineral resources has a role to play in meeting national and local demand. However, it is recognised that in some areas the availability of the resource is affected by environmental constraints.”

1.20 Urban MPA areas may be resource poor with respect to primary aggregates but may be able to make an important contribution to the supply of recycled aggregates in particular because these are derived from construction and demolition activities which tend to be associated with those areas.

1.21 In March 2014 the Government launched the new web-based National Planning Practice Guidance\(^{10}\) which replaced a raft of existing minerals policy guidance (including MPS1).

\(^9\) NPPF paragraph 145
\(^{10}\) http://planningguidance.planningportal.gov.uk/
**Other national guidance**

1.22 The overlap between the supply of recycled aggregates and sustainable waste management is of particular relevance and guidance on the latter is included in Planning Policy Statement (PPS10) ‘Planning for Sustainable Waste Management’ (Updated 2011) which in 2012 the External Review of Government’s Planning Practice Guidance (the Taylor Review) recommended should be retained but updated. ‘Updated national waste planning policy: Planning for sustainable waste management’ was subsequently published for consultation in July 2013. The government’s intention is that when finalised, the revised guidance will replace PPS10 and sit alongside the proposed new Waste Management Plan for England which was published for consultation in July 2013 and that waste policy and its supporting guidance should be streamlined.

1.23 The consultation drafts continue to emphasise the government’s view that waste should move up the waste management hierarchy. Recycling waste, e.g. to produce aggregates, sits in the middle of the hierarchy with prevention at the top and the least favoured option of landfill at the bottom.

1.24 The draft Waste Management Plan for England indicated that the construction, demolition and excavation sector is the largest contributing sector to total waste generation, c. 77mt of this waste having been generated in 2010. Although this was lower than 2008 government remains committed to meeting its target under the EU Waste Framework Directive of recovering at least 70% by weight of non-hazardous construction and demolition waste excluding naturally occurring material defined as ‘soils and stones’; latest calculations suggest that the recovery rate of construction and demolition waste to landfill is already 90%.

*National Aggregate Guidelines 2005-2020*

1.25 From time to time central government, through what is now the Department for Communities and Local Government, has published a set of national and regional guidelines for the provision of aggregates (now called national and sub-national guidelines). These have been based on econometric forecasts and assumptions on the likely contribution of demand for alternative aggregates (recycled and secondary aggregates), imports and marine dredged sand and gravel. The guidelines have then been apportioned to individual MPAs or groups of MPAs, by the former Regional Assemblies for the MPAs to test through the preparation of minerals plans but with the abolition of the assemblies this process in the south west was carried out by the South West Aggregates Working Party (SWAWP); the current guidelines cover the period 2005-2020. Although this assessment of future requirements for aggregates has now been

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11 The waste hierarchy is a framework derived from European Policy for securing a sustainable approach to waste management.
replaced by the Local Aggregates Assessment process, the MASS guidance advises that national and sub-national guidelines will continue to be published.

1.26 These guidelines will serve two key roles:
- They will seek to provide an indication of the total amount of aggregate provision that Mineral Planning Authorities, collectively within each Aggregate Working Party (AWP), should aim to provide and:
- They will provide individual MPAs, where they are having difficulty in obtaining data, with some understanding of the overall demand and possible sources that might be available in their Working Party area.

1.27 With respect to (a), the NPPF further advises that there is no expectation that each AWP must meet the total set out in the sub-national guidelines, especially if the environmental cost of doing so is unacceptable, nor is it expected or desirable that MPAs will simply take the figure for each sub-national level and apportion it amongst constituent authorities. Guidelines are to be seen as a means of providing an indicative amount that can be used as cross reference or another source of evidence when determining plans and MPAs may collectively decide to plan for more than is set out in the guidelines or, where based on robust evidence, plan for less.

1.28 However, as part of its localism agenda, government now requires all MPAs to produce an annual assessment of the demand for and supply of aggregates in their area (Local Aggregates Assessment), even if no mineral extraction takes place there. This assessment is to be based on supply options that include consideration of recycled aggregates and secondary aggregates.

1.29 The Guidelines, the most recent of which apply only to England, are for include assumptions about the likely contributions to meeting demand for alternative materials (secondary and recycled aggregates), imports and marine dredged aggregates but because of the requirement for a LAA these are now to be used only as indicative amounts. However they reflect the government’s aspirations for greater production of recycled materials and a concomitant reduction in the amount of primary aggregate extraction.

Regional Policy

1.30 By an Order made on the 19th April 2013 the Secretary of State confirmed the abolition of the Regional Spatial Strategy (RPG10) for the South West. The draft RSS that was being prepared for the period 2006-

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12 NPPG guidance on LAAs March 2014.
2026 to replace RPG10 was never adopted. The combination of these factors means that strategic policy is provided by the NPPF.

Local Policy

1.31 As well as the revocation of the Regional Spatial Strategy (see above) the minerals policies found previously in the Structure Plan 2nd Review (1999) were also revoked by the same Order. Local level policies for minerals in Gloucestershire are currently found in the Minerals Local Plan (1997-2006) which was adopted 2003. These are discussed in more detail within the relevant sections of this report.

1.32 The district local plans prepared in Gloucestershire include land-use policies for the protection of the historic environment and the promotion of local distinctiveness in new development. However, the County Council shares in this process as part of its own “spatial planning” responsibilities for the supply of minerals.

1.33 Consequently, the MLP must give careful consideration to the potential implications of those local policies, which support the protection and enhancement of the built environment. These may result in a clear need for safeguarding of important natural building stone resources and / or provision to meet specific building stone demands.

1.34 To help deliver these local plan policies, some districts have also produced a number of detailed supplementary planning guides, development briefs and character statements for conservation areas. Whilst these additional documents do not form part of the development plan, they act as important material considerations, which can influence development control decisions. Consequently, the MLP will need to carefully review each relevant local plan policy and associated supplementary planning documents, to determine their influence on the future strategy for natural building and roofing stone.

1.35 Similarly, district level planning across the county which embraces a wide range of policy areas, including housing, employment and industry, should also take account of the county’s strategies and proposals for minerals. The collaborative approach to planning and the Duty to Co-operate requirements¹⁴ should enable more effective stewardship of the county’s built heritage and environment, which appreciates the availability of appropriate and environmentally acceptable supplies of natural stone.

Other policy considerations

AONB Management Plans

1.36 Management Plans must be prepared for all designated Areas of Outstanding Natural Beauty (AONBs). The purpose of these plans is to

¹⁴ NPPF paragraph 157
highlight the special qualities and importance of each designation and present an integrated vision for their future. The plans must also set out specific objectives and policies to help secure the vision and identify their delivery mechanism.

1.37 AONB Management Plans play a significant role in spatial planning in Gloucestershire as just over 50% of the entire county area is designated as an AONB. There are three designations in Gloucestershire; Cotswolds, Wye Valley and Malvern Hills. All of these AONBs have adopted Management Plans.\textsuperscript{15}

1.38 There is an extremely close relationship between the county’s AONB designations and deposits (resources and reserves)\textsuperscript{16} of natural building and roofing stone. Most of Gloucestershire’s remaining reserves lie within, or adjacent to an AONB designation.\textsuperscript{17} Furthermore, it is the use of natural stone within elements of the local built environment that has helped define the special qualities of each designation. This is no more evident than in the Cotswold AONB, wherein; “The importance played by the built environment in defining the character of the Cotswolds AONB cannot be stressed too highly. There is perhaps no other part of rural England where social and cultural factors - as manifest in built and constructed elements - are so central to the notion of local distinctiveness.”\textsuperscript{18}

1.39 Within the Cotswold Hills AONB there is policy support for quarrying at an appropriate scale to provide continued supplies of local stone for local building materials throughout the AONB so long as impacts are acceptable and restoration schemes safeguard landscape, geodiversity and biodiversity.\textsuperscript{19} In the management Plan 2013-2018 it is considered that aggregate production in the AONB should be a by product and not the primary purpose of quarries in the area.

1.40 In the Wye Valley AONB Management Plan, quarries are encouraged to be operated and restored to a standard that is appropriate to the landscape character, geodiversity and biodiversity of the AONB and there is support for the working of building stone where there is a clear need for local conservation and heritage purposes where the scale and nature of mineral extraction is not seriously damaging to the special qualities, landscape character or natural beauty of the AONB.

1.41 The MLP will need to take into account the plans and proposed actions set out within each AONB Management Plan. This should help in establishing the future demand for local stone in the county and

\textsuperscript{16} See glossary for definition
\textsuperscript{17} As of 31/12/2005 81% of predicted permitted reserves of natural building and roofing stone were located within or adjacent to designated Areas of Outstanding Natural Beauty (AONBs).
\textsuperscript{18} Local Distinctiveness and Landscape Change Report for the Cotswold AONB – 2003
\textsuperscript{19} Cotswold Conservation Board Position Statement on Minerals and Waste 2003
assessing the capacity for new working opportunities, where they are deemed necessary. Landscapes and AONBs more generally are discussed in the *Planning and Environmental Considerations Evidence Paper* along with the draft proposed policy for landscape/AONB.

*English Heritage – Policy Statement on Minerals*

1.42 English Heritage is the Government’s advisor on the historic environment and it has published a policy document ‘*Mineral Extraction and the Historic Environment*’ which considers natural building stones. The statement sets out the basis for responses and views put forward by English Heritage on any matter relating to the winning and working and safeguarding of minerals. The statement sets out the background to the policy in three sections with the last of these being of particular relevance to this chapter of the MLP. The sections are:-

- the economic context and historic significance of mining and quarrying sites and landscapes;
- the Impacts on the historic environment that can be caused by mineral extraction, together with advice on appropriate mitigation measures and on realising the benefits to the understanding of the historic environment that may be gained through mineral working; and
- the need for and the supply of natural stone and other materials required to conserve the historic environment and maintain local distinctiveness.

1.43 In terms of maintaining the historic fabric and local distinctiveness of an area, EH sets out four key policies. The first of these “supports the continued working of certain minerals to maintain and repair significant aspects of the built heritage and to provide materials for new development that are in keeping with local character in order to conserve and enhance local distinctiveness”. The possible need to reopen historic quarries to achieve this aim is then recognised.

1.44 The second policy recognises the “need to identify Mineral Safeguarding Areas (MSAs) and to protect and facilitate supplies of historically and technically appropriate materials for a wide variety of landscape and townscape features such as walling and street furniture as well as for buildings”. This particular aspect is considered by the Council in the Safeguarding evidence paper. The next policy provides a commitment to the conservation, maintenance and enhancement of EH’s own historic estate by using mineral products that comply with EH’s policy, and the final policy highlights the role of historic advisors in reconciling the need for mineral supplies against the potential adverse impacts of quarrying on the historic environment.

1.45 There are other policies which are more generally relevant to the MLP, but these are considered within the companion evidence paper on *Planning and Environmental Considerations*. These include policies for
highways, landscape, biodiversity, archaeology, flooding and development management.
2.0 Aggregate Minerals in Gloucestershire

2.1 Introduction and Policy Context

2.1.1 Aggregates are essential for new construction and for maintaining the existing built infrastructure and they underpin the national economy. Natural (primary) aggregates i.e. natural rock that is crushed and screened to size and unconsolidated sand and gravel, which is normally just screened, provide the bulk of the country’s aggregate requirements and are widely distributed across the country but important, strategically placed deposits of both minerals are present in Gloucestershire.

2.1.2 The geology of Britain is such that to the southeast of a notional line drawn from the Tees in the northeast of England to the Exe in the southwest of the country. Rocks that are suitable for use as a crushed rock aggregate are generally not exposed at the surface, and hence not quarried, but large resources of unconsolidated sands and gravels are present in existing and former river valleys.

Figure 1: Crushed Rock Resources in Gloucestershire and Surrounding Areas

2.1.3 Gloucestershire, sitting astride this boundary, has resources of both minerals but its principal crushed rock industry is located in the Forest of
However, an important contribution to crushed rock supplies is made by some quarries that work softer rocks in the Cotswolds. Together the quarries from both subareas supply a wide range of clean and processed stone to the construction industry in the county and also to markets further afield. The resources are shown in Figure 1.

2.1.4 The main sand and gravel industry in the county (shown in Figure 2), which extracts unconsolidated deposits, is located in the Upper Thames Valley (UTV), extending from Somerford Keynes in the west through Down Ampney to Lechlade in the east. Unconsolidated sands and gravels, only worked historically in small quantities, are also to be found in the central Severn Vale of the county extending from the border of the county with South Gloucestershire and running northwards through Gloucester to Tewkesbury and beyond. In the extreme north of the county near Bromsberrow, a small sand and gravel quarry extracts solid sandstones to produce a fine sand. The UTV sands and gravels supply a wide range of aggregates to the construction industry in the county and also to markets further afield.

Figure 2: Sand & Gravel Resources in Gloucestershire and Surrounding Areas

2.1.5 The essential role played by the aggregates industry has long been recognised by central government and specific guidance aimed at ensuring an adequate and steady supply of aggregates to include

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20 Gloucestershire’s mineral resources are discussed in more detail in the evidence paper on Mineral Safeguarding.
recognition of inter regional relationships between production and
demand centres has featured in planning for aggregates for many years.
Although replaced recently by a new approach to planning for
aggregates, by the development of Local Aggregates Assessments,
strong policy drivers are evident in national guidance.

2.1.6 The level of demand for aggregates has, however, slowed in recent
years. Nationally this is because of the downturn in the economy, which
has resulted in some quarries being mothballed by industry, and because
of a greater intensity of use of aggregates in construction work; but sales
of primary aggregates have also reduced because in the last decade
there has been a rise in the contribution made to construction by
secondary and recycled aggregates i.e. aggregates that are produced as
a by-product of another minerals operation or are recycled from
construction demolition and excavation wastes. The substitution of
crushed rock for sand and gravel in some enduses may also have
contributed to the decline of sand and gravel sales.

2.1.7 Sales of primary aggregates will have been influenced by a combination
of these factors but overall, higher national production rates for most
types of aggregates can be envisaged at some point in the future as the
economy recovers and construction is revitalised. The effect of this is
unlikely to be evenly spread across the country with some areas
benefiting from higher construction rates more than others. Moreover,
those areas that have an historic role in supplying aggregates to markets
outside their boundaries, such as Gloucestershire, even if the level of
local construction is not particularly high, will undoubtedly also be called
upon to supply aggregates to areas of higher construction activity or
where local aggregate resources are in short supply.

2.1.8 Regional and local variations in the demand for and supply of aggregates
are a feature of the aggregates industry and are likely to continue to be
evident for both the crushed rock and sand and gravel industries. For
example, past production of sand and gravel in the county has offset
reduced sales of indigenous sands and gravels in the county’s export
markets, e.g. Wiltshire and Oxfordshire, such that sales from
Gloucestershire’s pits have consistently been about 0.8mtpa for more
than 10 years, dropping to 0.66mt only in 2008. If adequate supplies are
not forthcoming from Oxfordshire and/or Wiltshire in the future this may
continue to impact on sales from Gloucestershire. Similar supply
considerations will also apply to the county’s crushed rock industry.

2.1.9 Sand and gravel tends to have a fairly local market but because the UTV
resource borders the south east England market this may influence the
level of sales from the county. The county’s crushed rock industry,
however, is located in the Forest of Dean and in the Cotswolds.
Because of transport distances and the greater availability of crushed
rock aggregates in adjacent resource areas towards the west side of the
county, exports from the former area are more likely to be influenced by the West Midlands and Welsh construction markets more than the South East. In the Cotswolds the reverse is likely to apply if at all but the type of crushed rock aggregates produced here have a limited use and a more local market tends to be supplied as a result.21

2.1.10 Crushed rock quarrying can be an intrusive operation with blasting, dust emissions noise and the movement of HGVs often giving rise to local concern but as quarries ‘mature’ some of these problems can be reduced or even eliminated. The potential effect on areas of the county that are much valued for their landscape quality e.g. Areas of Outstanding Natural Beauty such as the Cotswolds and the Wye Valley is also of great concern to the County Council but these areas owe their existence to the underlying geology and the crushed rock industry within or nearby may have been established over a long timeframe.

2.1.11 The winning and working of unconsolidated sand and gravel deposits is a relatively innocuous operation in comparison to crushed rock in the sense that excavation does not require the use of explosives and normally there is no size reduction of the minerals only screening. The main issues are the generation of HGV traffic, relatively quick land take compared to hard rock quarries, due to low yields per unit area, and the method of restoration of exhausted excavations.

2.1.12 It is therefore necessary to develop a sound policy framework that will not only ensure a steady and adequate supply of primary crushed rock aggregates but which will also protect and enhance the natural environment and valuable landscapes of the county and will protect the amenities of the residents and communities on the county.

Existing Local Policy - 2003 Minerals Local Plan

2.1.13 Chapter 3 and Policies A1-A7 of the Gloucestershire Minerals Local Plan set out the approved local policy for the supply of primary aggregates in the county.

Emerging Minerals Development Plan Documents

2.1.14 The Issues and Options Report that was produced for consultation in 2006 as part of the initial work on a Minerals Core Strategy (MCS), which is now to be replaced by this Local Plan, offered stakeholders their first opportunity to consider what was then the new local apportionment for Gloucestershire for crushed rock and for sand and gravel, and to discuss a workable policy framework for the MCS. The guidelines that formed the basis of this consideration were for the period 2001-2016 but these have since been replaced with set for the period 2005-2020 which SWAWP apportioned to MPA level. The earlier guidelines underpinned

21 Further information on market supply of aggregates to and from Gloucestershire is contained within the baseline report to the LAA available from http://www.gloucestershire.gov.uk/extra/article/115811/Local-Aggregates-Assessment
the council’s baseline investigations into aggregates and from those investigations its development of Issues and Options that were subsequently consulted upon in 2006\textsuperscript{22}. In 2008 consultations were carried out on three resultant preferred options for crushed rock and five preferred options for sand and gravel.

2.1.15 The preferred options were;

**MPO3a**

Preferred option MPO3a seeks to ensure sufficient provision is made to deliver the remaining local apportionment for crushed rock in Gloucestershire (presently 2006-2016). It also supports maintaining a 10-year landbank for crushed rock at the end of the guideline period at 2016. Delivering this option would be based on a 70:30 split of the provision requirement between the Forest of Dean and Cotswold crushed rock resource areas. This approach was previously used with the adopted Minerals Local Plan.

Based on the assessment carried out in Technical Paper MCS-B, option MPO3a may result in new working areas having to be identified within the Forest of Dean resource area. These working areas may include:-

- A new lateral or deepening extension(s) to one or more of the existing crushed rock quarries; and/or
- An increase in size of one or more of the undeveloped preferred areas set out in the adopted Minerals Local Plan; and/or
- A new greenfield site.

**MPO3b**

Preferred option MPO3b looks to adopt a more strategic/sub-regional approach to meeting the county’s provision requirements. Its aim is to resolve the projected local shortfall in crushed rock provision by considering the merits of re-apportionment for Gloucestershire. This would be based on a comparative assessment between remaining crushed rock resources in the county and those within less constrained resource areas found within South Gloucestershire, North Somerset and/or Somerset.

In delivering option MPO3b, environmental constraints, technical acceptability and economic viability issues within each sub-regional resource area, will need to be fully and comparatively assessed. A full sub-regional level Sustainability Appraisal and Appropriate Assessment of each resource area will also be required. Furthermore, due to the strategic nature of this option, the South West Regional Assembly (SWRA) as the RPB will need to take a leading role in undertaking the comparative assessment alongside the full co-operation of the respective minerals planning authorities.

**MPO3c**

\textsuperscript{22} In addition, in July 2006, GCC undertook two public minerals forums to introduce headline issues and options for the emerging MCS. Information on the forum outcomes can be viewed on the GCC website via - http://www.gloucestershire.gov.uk/index.cfm?articleid=13348
Preferred option MPO3c proposes a local reassessment within the county resources of delivering Gloucestershire’s local apportionment. This option would mean a more flexible approach to making provision by utilising all of the county’s permitted reserves and potential reserves within undeveloped preferred areas. This is in preference to focussing upon the limitations of specific resource areas, as identified within the adopted Minerals Local Plan.

A potential result of this option would be a revised split of local provision requirements between the Forest of Dean and Cotswold resource areas. A realistic assessment of deliverability would need to be made regarding this option. However, it may also highlight a more fundamental review of the local apportionment, such as a reapportionment for Gloucestershire as considered under option MPO3b.

MPO4a
Preferred option MPO4a seeks to ensure sufficient provision is made to meet the remaining local apportionment of sand and gravel for Gloucestershire (presently 2006-2016). It also supports maintaining a 7-year landbank for sand and gravel at the end of the guideline period at 2016. Based on the assessment carried out in the Technical Paper MCS-A, option MPO4a may result in additional areas for future mineral working having to be identified.

MPO4b
Preferred option MPO4b looks to adopt a similar methodology to that of option MPO4a, by seeking to ensure sufficient provision is made to meet the local apportionment for Gloucestershire. However, it supports a longer landbank provision through to 2026, which is 10 years beyond the end of the guideline period. The aim of option MPO4b is to synchronise the local policy for sand and gravel provision with that of the spatial vision of the MCS and the emerging RSS.

MPO4c
Preferred option MPO4c proposes a more strategic/ sub-regional approach to sand and gravel provision. It offers more proactive support for resolving the projected shortfall in sand and gravel provision across the region.

Beyond the local requirements observed in options MPO4a and MPO4b, this option proposes a potential additional commitment for Gloucestershire. It is based upon maintaining appropriate, steady and consistent supplies of sand and gravel right across the strategic resource area of the Upper Thames valley. This may result in Gloucestershire subsuming some of the local provision requirements for the neighbouring areas of Wiltshire and Swindon. The aim of option MPO4c is to expand existing joined-up working for minerals in the Upper Thames Valley. Through close co-ordination this may also support opportunities to develop a holistic spatial strategy for the area that goes beyond mineral developments.

Delivering option MPO4c will require changes to the local apportionment for
Gloucestershire. It may also require fundamental changes to working arrangements in the Upper Thames valley including a formal joint working policy and/or a change in how decisions are taken in the area.

**MPO5a**
Preferred option MPO5a proposes a more dispersed strategy for future sand and gravel working. Whilst recognising the strategic significance of the Upper Thames Valley resource area, it seeks to acknowledge the provision potential of the Severn Vale Corridor resource area. Where the spatial strategy indicates that new site allocations should be identified, the relative merits of potential sites within each resource area will be considered.

**MPO5b**
Preferred option MPO5b proposes a preference towards future sand and gravel working within the Upper Thames Valley resource area. Where new mineral site allocations are required in the future, these will be focussed within the Gloucestershire section of this resource area.

2.1.16 The preferred options looked at ways in which the provision should be assessed and made and at options for the spatial distribution to meet the provision.

2.1.17 The council's detailed consideration of the consultation responses on these options is set out in a 2008 report. In summary, the council concluded that for crushed rock whilst there was no overall consensus on a preferred option, although options MPO3a and MPO3b received most support, the MCS should work towards a hybrid option of Option MPO3a in the short term, potentially up to 2024, while working upon longer term provision on the basis of Option MPO3b. This was in recognition that at that time the existing landbank of permitted reserves and resources in unworked preferred areas were sufficient to meet the county’s crushed rock apportionment of the 2001-2016 guidelines to about 2024 but that in the longer term provision would be sought by a sub-regional assessment of resource availability in both Gloucestershire and the surrounding adjacent administrative areas, an approach then being investigated by the now defunct Regional Assembly.

2.1.18 The council recognised that if the hybrid option could not be achieved then provision would have to be made on the basis of a combination of lateral extensions or deepening or extensions of quarries/MLP preferred areas in the Forest of Dean (preferred option MPO3a).

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23 Minerals Core Strategy Preferred Options Consultation Response Report Summer 2008
2.1.19 For sand and gravel the council concluded that the emerging provision option appeared to be a combination of preferred options MPO4b and MPO4c. Based on the apportionment amount of the aggregate guidelines then in force, permitted reserves and potential yields from preferred areas were considered to be sufficient for production to 2021 but it was intended that further provision to meet an identified shortfall of 5.34mt to 2026 would be sought through a joint arrangement with Wiltshire/Swindon on working the UTV resource as a whole. To facilitate this arrangement the County Council was looking to the SWRA as the regional planning board to possibly take a lead.

2.1.20 With regard to locational options for sand and gravel working the results of the consultation exercise were considered to be inconclusive. Potentially the best approach appeared to be exploiting the recent supply pattern which was centred on the major resources of the UTV but the different mineralogy of the significant Severn Vale sand and gravel resources and their proximity to growth areas around Gloucester and Cheltenham were recognised as having a future role to play in meeting some supplies.

2.1.21 Since 2008, however, three important high level issues have arisen.
- The current national and sub-national guidelines for crushed rock cover the period 2005-2020 and are lower than for the 2001-2016 guidelines and therefore the apportionment for Gloucestershire is also lower.
- Apportionments are now only an indication of future provision and that the more pertinent figures for Gloucestershire are those contained within its Local Aggregates Assessment; these are also lower than the most recent apportionments.
- The South West Regional Assembly no longer exists. Consequently ‘pioneering’ work that was being progressed by the Assembly on the possibility of resolving an expected shortfall in crushed rock provision in the county, by taking account of resources in neighbouring MPAs (South Gloucestershire, North Somerset and /or Somerset), was abandoned when the Assembly was abolished and the Assembly will not now be able to assist in broking any sub-regional agreement between the county Council and Wiltshire/Swindon on joint arrangements for working the UTV resources. Regional policy was also revoked as part of this process. The emerging RSS policy was therefore never adopted and has no formal currency. The Regional Planning Body, as part of the Assembly, was also abolished.

2.1.22 A proxy for strategic planning is provided, however, by the statutory procedures now in place on cross boundary co operation between planning authorities. The work carried out by the County Council to meet this requirement to date (2004 Act S33A-Duty to Co-operate) is outlined in an accompanying evidence paper. Although discussions have taken
place between the councils under the Duty to Co-operate requirement both Wiltshire/Swindon have pursued and adopted a full set of minerals Development Plan documents which broadly make provisions for aggregate needs based on their own assessments. Subsequently an Aggregates Site Allocations Plan (with 5 sites in the UTV) has also been recently adopted in 2013\textsuperscript{24}. Although the MCS adopted in 2009\textsuperscript{25} has a policy for mineral framework regarding the cross border issues in the UTV no provision has since been made to provide for a formal arrangement on joint working for the UTV. Oxfordshire has also reached and advanced stage of plan preparation and have subsequently chosen to prepare a policy framework for their own area.

2.1.23 Detailed consideration of these and other aggregates issues of relevance today is covered in Section 4 on Key Issues.

2.2 Primary Aggregates in Gloucestershire

2.2.1 These sections update the information on crushed rock and sand and gravel that was included in the March 2008 Technical Papers MCS-B and MCS-A, which in turn had updated earlier 2007 Technical Papers. The sections should be read in conjunction with the Second Local Aggregates Assessment (LAA) for the county and the accompanying Baseline Report\textsuperscript{26}.

*Crushed Rock*

2.2.2 The LAA identifies a proposed local provision of 1.6mtpa of crushed rock which is the average of 10 years’ sales (2003-2012) inclusive and which shows that this average level of production has resulted from an annual sales level of about 1.85mt between 2003 and 2008 but, due to the onset of the economic recession and the mothballing of Drybrook Quarry in the Forest of Dean in 2008, a lower level of production in the order of 1.2mtpa since 2008. The amount for 2012 (1.18mt) has also remained at this low level. For the purposes of aggregates planning sales are accepted as equating to production; crushed rock sales used in the calculation of the LAA are shown in Table\textsuperscript{1}.

| Table 1. Gloucestershire Crushed Rock C/R Production 2003-2012(mt)\textsuperscript{27} |
|---------------------------------|--------|--------|--------|--------|--------|--------|--------|--------|--------|
| C/R                             | 2003   | 2004   | 2005   | 2006   | 2007   | 2008   | 2009   | 2010   | 2011   | 2012   | 10 Yr Av | 3 Yr Av |
|                                 | 1.75   | 1.91   | 1.95   | 1.81   | 2.08   | 1.61   | 1.17   | 1.2    | 1.3    | 1.18   | 1.6      | 1.23     |

2.2.3 When the average annual production is extrapolated over the period of the MLP to 2030, this cumulatively adds up to a reserve requirement of 28.8mt (1/2013-31/2030-1.6mt x 18 years). The annual provision level of

\textsuperscript{24}http://www.wiltshire.gov.uk/planninganddevelopment/planningpolicy/mineralsandwastepolicy/aggregatemineralssiteallocations.htm

\textsuperscript{25}http://www.wiltshire.gov.uk/planninganddevelopment/planningpolicy/mineralsandwastepolicy.htm#minerals_core_strategy

\textsuperscript{26}Local Aggregates Assessment 2013

\textsuperscript{27}SWAWP Annual Reports
1.6mt is lower than the annualised crushed rock apportionment that was derived by SWAWP from the 2005-2020 National and Sub National Guidelines for the Provision of Aggregates in England (2.25mtpa) and much lower again than the annualised apportionment of the 2001-2016 guidelines (2.44mtpa) as reported in the 2008 Technical Paper. A comparison of the most relevant provision amounts which has been adjusted to a start date of 1/2013 is shown in Table 2.

Table 2. Comparison of the crushed rock provisions calculated by using the annualised amounts derived from the 2005-2020 guidelines and from the second LAA.

<table>
<thead>
<tr>
<th>Annual Provision</th>
<th>A - Required cumulative amount for the period 1/2013-1/2020 (7yrs) based on annual provision</th>
<th>B - Required cumulative amount for the period 1/2020-12/2030 (11yrs) based on annual provision</th>
<th>C - 10 year landbank at end of the plan period 12/2030 based on annual provision</th>
<th>Requirement A+B+C for period 1/2013-12/2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>2.25mt from apportionment of the 2005-2020 guidelines</td>
<td>15.75mt</td>
<td>24.75mt</td>
<td>22.50mt</td>
<td>63mt</td>
</tr>
<tr>
<td>1.6mt from the LAA</td>
<td>11.2mt</td>
<td>17.6mt</td>
<td>16mt</td>
<td>44.8mt</td>
</tr>
</tbody>
</table>

2.2.4 The County Council proposes to use the second LAA amount of 1.6mtpa as the basis for calculating future aggregate requirements and with it the level of reserves needed to meet them. The MASS guidance indicates that LAAs are to be completed annually as this will monitor trends and will indicate whether the level of permitted reserves and any resources that might be allocated in the plan are sufficient. Notwithstanding the practice of regular reviews of plans, inadequate provision of reserves and resources alone could warrant a timely review of the MLP.

2.2.5 The crushed rock resources of Gloucestershire are located in the Forest of Dean in the west, where Carboniferous limestones are worked, and in the east of the county in the Cotswolds where softer Jurassic limestones are quarried for lower specification aggregate end uses. The proportional contribution to supplies made by each area has consistently been in the order of 70% and 30% respectively. This split has been established by a combination of factors, such as the location of the resources with respect to areas of construction, the level of demand for construction products within those market areas, the suitability of the resources for various end uses, the level of penetration in to those market areas by quarries located outside the county, company control over the Gloucestershire quarries and the operational strategies of the individual companies. Accordingly the proportional contributions made by the two areas to supplies may change because of these commercial factors.
2.2.6 Changes to operational control may also come into play to change this situation. For instance, the recent acquisition of Clearwell Quarry by Midlands based Breedon Aggregates, the company’s first acquisition in the county and indeed the southwest of England, has introduced a new player into the local market whose operational strategy may possibly change the historical supply pattern. However, until the effects of this development become clear and any change in the supply trend becomes evident from monitoring sales the County Council considers that the 70:30 split can still be used in the MLP in determining future production requirements for the two resource areas.

2.2.7 Although during the Issues and Options consultation stakeholders supported the subdivision of the county’s crushed rock resources between the two areas there was no overwhelming agreement to continue the 70:30 split as adopted in the 2003 MLP. Recent surveys at the time suggested that the split was still relevant in terms of supply trends and surveys since then have confirmed that this view remains appropriate. The Baseline Report of the first LAA\textsuperscript{28} highlights in paragraphs 5.10 and 5.11 and in Fig 5.1 that the 70:30 split has been evident over the last 10 years or so. The annual requirements from the two resource areas that can therefore be derived from the second LAA requirement in Table 2 by using these proportional contributions to supplies are shown in Table 3.

Table 3. Localised crushed rock provision requirements for the Forest of Dean and Cotswolds resource areas using the second LAA amount to December 2040.

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Localised Annual Provision Rate of 1.68mt</th>
<th>A - Required cumulative amount for the period 1/2013-1/2020 (7yrs) based on annual provision</th>
<th>B - Required cumulative amount for the period 1/2020-12/2030 (11yrs) based on annual provision</th>
<th>C - 10 year landbank at end of the plan period 12/2030 based on annual provision</th>
<th>Requirement A+B+C for period 1/2013-12/2040</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest of Dean</td>
<td>1.12mt (70% of 1.6mt)</td>
<td>7.84mt</td>
<td>12.32mt</td>
<td>11.2mt</td>
<td>31.36mt</td>
</tr>
<tr>
<td>Cotswolds</td>
<td>0.48mt (30% of 1.6mt)</td>
<td>3.36mt</td>
<td>5.28mt</td>
<td>4.8mt</td>
<td>13.44mt</td>
</tr>
<tr>
<td>County Total</td>
<td></td>
<td>11.2mt</td>
<td>17.6mt</td>
<td>16.0mt</td>
<td>44.8mt</td>
</tr>
</tbody>
</table>

2.2.8 For comparison the provision requirements for a MLP period ending 12/2030 but excluding a 10 year landbank thereafter are shown in Table 4.

\textsuperscript{28} LAA Baseline Report 2013
Table 4. Localised crushed rock provision requirements for the Forest of Dean and Cotswolds resource areas using the second LAA amount to December 2030.

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>Localised Annual Provision Rate of 1.6mt</th>
<th>A - Required cumulative amount for the period 1/2013-1/2020 (7yrs) based on annual provision</th>
<th>B - Required cumulative amount for the period 1/2020-12/2030 (11yrs) based on annual provision</th>
<th>Requirement A+B for period 1/2013-12/2030</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest of Dean</td>
<td>1.12mt (70% of 1.6mt)</td>
<td>7.84mt</td>
<td>12.32mt</td>
<td>20.16mt</td>
</tr>
<tr>
<td>Cotswolds</td>
<td>0.48mt (30% of 1.6mt)</td>
<td>3.36mt</td>
<td>5.28mt</td>
<td>8.64mt</td>
</tr>
<tr>
<td>County Total</td>
<td></td>
<td>11.2mt</td>
<td>17.6mt</td>
<td>28.8mt</td>
</tr>
</tbody>
</table>

**Crushed Rock Permitted Reserves and Landbanks**

2.2.9 The 2012 annual survey of crushed rock quarries in the county shows that as at 31 December 2012 permitted reserves amounted to c.29.73mt, of which 18.10mt are associated with the Forest of Dean quarries and 11.63mt with quarries in the Cotswolds. Applying the second LAA’s countywide requirement of 44.8mt to 2040 (as calculated from Table 3 shows that overall an additional 15.07mt of permitted reserves would be needed for this period but if the lower amount of 28.8mt to 2030 is required, as shown in Table 4, then permitted reserves are just sufficient.

2.2.10 If the same calculation is used for the two resource areas by using their individual permitted reserves and the figures in Table 5, a shortfall of just over 2mt is evident for the FoD but a surplus of 3mt is calculated for the Cotswolds. However, shortfalls in both areas are evident if provision for a 10 year landbank post 2030 (Table 3 figures) is included in the calculations (13.26mt in the FoD and 1.81mt in the Cotswolds).

2.2.11 These calculations are summarised in Table 5.

Table 5. Summary of County and Resource Area Crushed Rock requirements

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>A Permitted Reserves as at 1/2013</th>
<th>B Requirement for period 1/2013-12/2030</th>
<th>B-A Shortfall (surplus)</th>
<th>C Requirement for period 1/2013-12/2040</th>
<th>C-A Shortfall (surplus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Forest of Dean</td>
<td>18.10mt</td>
<td>20.16mt</td>
<td>2.06mt</td>
<td>31.36mt</td>
<td>13.26mt</td>
</tr>
<tr>
<td>Cotswolds</td>
<td>11.63mt</td>
<td>8.64mt</td>
<td>(2.99mt)</td>
<td>13.44mt</td>
<td>1.81mt</td>
</tr>
<tr>
<td>County</td>
<td>29.73mt</td>
<td>28.8mt</td>
<td>(0.93mt)</td>
<td>44.8mt</td>
<td>15.07mt</td>
</tr>
</tbody>
</table>

**Crushed Rock Preferred Areas/Site Options**

2.2.12 The adopted MLP 2003, which similarly calculated a potential shortfall in crushed rock supplies, albeit using the then current guidelines and
reserve assessments, identified preferred areas for further extraction in order to overcome the identified shortfall. Three preferred areas were identified as extensions to three quarries in the FoD and two were identified as extensions to two quarries in the Cotswolds. Since then, however, planning permissions have been approved at some of these sites and their permitted reserves are now included in the latest calculation of permitted reserves with the result that the remaining, unworked, resources within the preferred areas have reduced accordingly. As at 2013 the unworked preferred areas in the FoD have estimated resources of 4.5mt whereas in the Cotswolds these may be up to 20.3mt.

2.2.13 These preferred areas were carried forward under transitional arrangements pending the adoption of a new MLP and as areas in which the principle of quarrying has already been established through the process of adopting the existing (2003) MLP they are a material consideration in the assessment of what additional amounts of rock (if any) may need to be provided through the new plan. If the remaining preferred area resources are permitted for extraction, following the approval of a necessary planning permission, they have the potential to increase the stock of permitted reserves by the amounts referred to above.

2.2.14 Although the general environmental and commercial suitability of the preferred areas in the adopted MLP was considered in great depth and tested at the time, it will be necessary for the remaining preferred areas to be re-considered in the preparation of the new MLP as their potential may have changed with the passage of time. This assessment, along with that for other sites that have been submitted for consideration as potential working areas as a result of the Council’s ‘Call for Sites’, is included in the Consultation Documents and detailed evidence papers.

2.2.15 The assessment identifies the environmental and land use interests that might be affected by working these areas and also includes an assessment of the potential yield of each area. At this stage all these sites, including the remnants of the 2003 MLP Preferred Areas form part of the Site Options consultation. No decisions have been reached as yet as to which sites will be taken forward as site allocations in the formal stages of the new MLP. This will be subject to the consultation process in 2014 and the preparation of the formal stages of the MLP in 2015.

Sand and Gravel

2.2.16 The LAA identifies a proposed local provision of 0.83mtpa of sand and gravel which is the average of 10 years’ sales (2003-2012) inclusive and which shows that this average level of production has resulted from a fairly consistent annual sales level of just under 1mt between since 2003. However, the amount for 2012 fell slightly from the previous three years to 0.78mt.
2.2.17 For the purposes of aggregates planning sales are accepted as equating to production; sand and gravel sales used in the calculation of the second LAA are shown in Table 6.

### Table 6: Gloucestershire Sand & Gravel (S/G) Production 2003-2012(mt)

<table>
<thead>
<tr>
<th></th>
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<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>S/G</td>
<td>0.7</td>
<td>0.84</td>
<td>1.03</td>
<td>0.72</td>
<td>0.9</td>
<td>0.66</td>
<td>0.93</td>
<td>0.9</td>
<td>0.85</td>
<td>0.78</td>
</tr>
</tbody>
</table>

2.2.18 Since c. 2003 as annual sales have fallen or risen in Gloucestershire the opposite swing in production has been evident in Wiltshire/Swindon; this is believed to reflect the very close operational relationship that exists between the MPAs; amount of control that individual companies have over production sites, the location of the sites, the granting of planning permissions and the exhaustion of reserves at some sites.

2.2.19 When the average annual production is extrapolated over the period of the MLP to 2030, this cumulatively adds up to a reserve requirement of 14.94mt (1/2013-31/2030). The annual provision level of 0.83mt is only slightly lower than the annualised sand and gravel apportionment that was derived by SWAWP from the 2005-2020 National and Sub National Guidelines for the Provision of Aggregates in England (1.0mtpa) and much lower again than the annualised apportionment of the 2001-2016 guidelines (1.14mtpa) as reported in the 2008 Technical Paper. A comparison of the most relevant provision amounts which has been adjusted to a start date of 1/2013 is shown in Table 7.

### Table 7: Comparison of the sand and gravel provisions calculated by using the annualised amounts derived from the 2005-2020 guidelines and from the second LAA.

<table>
<thead>
<tr>
<th>Annual Provision</th>
<th>A - Required cumulative amount for the period 1/2013-1/2020 (7yrs) based on annual provision</th>
<th>B - Required cumulative amount for the period 1/2020-12/2030 (11yrs) based on annual provision</th>
<th>C - 7 year landbank at end of the plan period 12/2030 based on annual provision</th>
<th>Requirement A+B+C for period 1/2013-12/2037</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.0mt from apportionment of the 2005-2020 guidelines</td>
<td>7mt</td>
<td>11mt</td>
<td>7mt</td>
<td>25mt</td>
</tr>
<tr>
<td>0.83mt from the LAA</td>
<td>5.81mt</td>
<td>9.13mt</td>
<td>5.81mt</td>
<td>20.75mt</td>
</tr>
</tbody>
</table>

29 SWAWP Annual Reports
2.2.20 The County Council proposes to use the second LAA amount of 0.83mtpa as the basis for calculating future aggregate requirements and with it the level of reserves needed to meet them. The MASS guidance indicates that LAAs are to be completed annually as this will monitor trends and will indicate whether the level of permitted reserves and any resources that might be allocated in the plan are sufficient. Notwithstanding the practice of regular reviews of plans, inadequate provision of reserves and resources alone could warrant a timely review of the MLP.

2.2.21 With the exception of a small amount of sales that arise from extraction at the quarry near Bromsberrow and from working sand and gravel at a couple of sites in the Severn Vale, all sand and gravel sales come from the UTV and traditionally the UTV has been the dominant source of these aggregates for many years. Deposits there have proved to be more commercially attractive than the Severn Vale and easy to work and although resources have diminished considerably, substantial, relatively unconstrained tonnages can still be found. Elsewhere in the UTV in Wiltshire/Swindon the MPAs have identified five locations considered suitable for future mineral working.

2.2.22 Because of commercial confidentiality it is not possible to apportion the amounts in Table 7 between the UTV and Severn Vale resource areas based upon their proportional contributions to supplies. The same reason also applies to the bedrock sandstone deposit at Bromsberrow but as this unique deposit is worked on a very small scale for uses such as pipe bedding and not the full range of aggregate commodities of the types that may be produced from the superficial sands and gravels in the other resource areas this approach to estimating demand is not particularly relevant.

2.2.23 The siliceous mineralogy of the Severn Vale deposits is different from that of the deposits in the UTV and as a result although both resources can be worked to provide a comprehensive range of aggregate commodities those in the Severn Vale are more suitable for use in chemically resistant concrete. Their colour is also different from the limestone based UTV resources which determines their popularity in some applications. As mentioned above, the Severn Vale is also local to potential growth centres in Gloucester and Cheltenham but it is not as strategically placed to supply to the areas served by the UTV.

2.2.24 When it was possible to identify the proportions of production from the two resource areas without breaching confidentiality it was found that the UTV provided about 95% of sales with the remaining 5% coming from the Severn Vale. However, over the last 5 years this has been more in the range of 98% and 2%; the more recent contribution to sales from the Severn Vale is therefore ≤2%. These historic contributions to supplies are probably still valid today as the industry has continued to concentrate
production on the UTV and only two small sites are currently operating in the Severn Vale. If this split were to be used to determine the future provision from each area it would deny the potential opportunity for the Severn Vale to increase its share of production, where deemed environmentally suitable, as reserves decline in the intensively worked UTV where constraints to working there are likely to become increasingly greater in the longer term.

2.2.25 However, substantial unworked resources are present in the UTV and planning applications to work these are currently awaiting determination or are being prepared by industry. It is also the case that the industry in general currently favours production from the UTV where mineral and land owners are also quite amenable to granting rights to quarry and where the industry supports a number of value added product operations in the area.

2.2.26 The UTV has a long history of restoring exhausted pits to water based conservation and recreation uses which has culminated in the creation of the Cotswold Water Park and successful restoration elsewhere in the UTV. However, much remains to be completed and there are tensions in some parts, particularly with regard to the type of restoration near Fairford Airfield. Contributions from alternative resources such as those in the Severn Vale may therefore have a role to play in meeting future provision of sand and gravel given their close proximity to the Gloucester and Cheltenham construction markets.

2.2.27 However, increased working in the Severn Vale also has a number of environmental factors to consider, not least of which is the supporting infrastructure for the distribution of the mineral. Additionally, industry has shown interest in developing only a few locations at a relatively low scale such as at Frampton on Severn and in locations near the county boundary with Worcestershire.

**Sand and Gravel Permitted Reserves and Landbanks**

2.2.28 The 2012 annual survey of sand and gravel pits in the county shows that as at 31 December 2012 permitted reserves amounted to c. 6.02mt. Applying the LAA’s countywide requirement of 20.75mt to 2037 (as calculated from Table 7) shows that overall an additional 14.73mt of permitted reserves would be needed for this period but if the lower requirements of 14.94mt to 2030 are required, as shown in Table 8, then additional permitted reserves of only 8.92mt would be required.

<table>
<thead>
<tr>
<th>Resource Area</th>
<th>A - Permitted Reserves as at 1/2013</th>
<th>B - Requirement for period 1/2013-12/2030</th>
<th>B-A Shortfall (surplus)</th>
<th>C - Requirement for period 1/2013-12/2040</th>
<th>C-A Shortfall (surplus)</th>
</tr>
</thead>
<tbody>
<tr>
<td>County</td>
<td>6.02mt</td>
<td>14.94mt</td>
<td>8.92mt</td>
<td>20.75mt</td>
<td>14.73mt</td>
</tr>
</tbody>
</table>
Sand and Gravel Preferred Areas/Site Options

2.2.29 The adopted MLP 2003, which similarly calculated a potential shortfall in sand and gravel supplies, albeit using the then current guidelines and reserve assessments, identified preferred areas for further extraction in order to overcome the identified shortfall. These were identified as possible extensions to four quarries. Since then, however, planning permissions have been approved at some of these sites and their permitted reserves are now included (unless already worked out) in the latest calculation of permitted reserves with the result that the remaining, unworked, resources within the preferred areas have reduced accordingly. Also geological assessments of the unworked preferred areas have resulted in a recalculation of potential yield by industry. As at 2013 the unworked preferred areas have estimated resources of c.8.6mt.

2.2.30 These preferred areas were carried forward under transitional arrangements pending the adoption of a new MLP and as areas in which the principle of quarrying has already been established through the process of adopting the existing (2003) MLP they are a material consideration in the assessment of what additional amounts of sand and gravel may need to be provided through the new plan.

2.2.31 If these remaining preferred area resources are permitted for extraction, following the approval of a necessary planning permission, they have the potential to increase the stock of permitted reserves by the amount referred to above.

2.2.32 The general environmental and commercial suitability of the preferred areas in the adopted MLP was considered in great depth and tested at the time but, as for crushed rock, it will be necessary for the remaining preferred areas to be re-considered because their potential may have changed since. This assessment, along with that for other sites that have been submitted for consideration as potential working areas as a result of the Council’s ‘Call for Sites’, is contained within the Consultation Document and detailed Evidence Paper on Sites.

2.2.33 The assessment identifies the environmental and land use interests that might be affected by working these areas and also includes an assessment of the potential yield of each area. At this stage all these sites including the remnants of the 2003 MLP Preferred Areas form part of the Site Options consultation. No decisions have been reached as yet as to which sites will be taken forward as site allocations in the formal stages of the new MLP. This will be subject to the consultation process in 2014 and the preparation of the formal stages of the MLP in 2015.
2.3 Key Issues facing Gloucestershire

2.3.1 The Council’s report on the MCS Preferred Options consultation in 2008 for crushed rock indicated its intention to pursue a hybrid of options MPO3a and MPO3b based on the consideration of:

- delivering the then remaining local apportionment of crushed rock for Gloucestershire as calculated from the apportionment of the national aggregates guidelines for the period 2001-2016;
- continuation of the 70:30 contribution to supplies made by the county’s two crushed rock resource areas;
- maintaining a 10 year landbank at the end of the guideline period (2016) and;
- in the longer term resolving the then projected shortfall by considering the potential for supplies from South Gloucestershire.

2.3.2 For sand and gravel, the consultation indicated that the then emerging provision option for sand and gravel was a combination of options MPO4b and MPO4c. This would deliver the remaining apportionment of the national aggregates guidelines for the period 2001-2016 and for 10 years beyond to 2026. This end date would be coincident with that of the emerging RSS for the south west that was being prepared by the SWRA. Consideration of MPO4c would facilitate a wider sub-regional contribution to supplies that would recognise the role of the UTV across the border with Wiltshire/Swindon which might then necessitate a reapportionment of future requirements between the MPAs.

2.3.3 Issues that now need to be addressed in the MLP are:

- For both aggregates; the sub-regional apportionment amounts for Gloucestershire are lower than were previously identified and in any case are now only indicative amounts for the period 2005-2020 and future provision is to be based on the LAA for Gloucestershire and the identified annual amounts are lower again than the indicative apportionments.
- the share of supplies expected from the resource areas
- the appropriate period for the provision of aggregates given that plans should run for a 15 year period from adoption but noting that the NPPF requires MPAs to maintain a rolling landbank of 10 years for crushed rock and 7 years for sand and gravel
- the deliverability of the required amounts of crushed rock and sand and gravel
- for crushed rock the degree of conflict with AONB designations
- following the abolition of the South West Regional Assembly, the possibility of a sub-regional review of provision for aggregates now falling to the County Council and adjacent MPAs to investigate.
2.3.4 The following commentary provides a discussion on the scope for taking forward different approaches stemming from these issues and taking account of the latest evidence and the current statutory context.

**Apportionment, the Gloucestershire Local Aggregates Assessment and the provision required in the MLP**

2.3.5 As indicated above, since the early work on the MCS, new national guidelines for the provision of aggregates in England have been published by DCLG for the period 2005-2020. Although these have 7 years remaining, guidelines are periodically reviewed by DCLG; for the time being the County Council therefore has to work with the current guidelines.

2.3.6 The sub-national apportionment of the crushed rock amount for the south west in the current guidelines has resulted in an annualised provision of 2.25mt; this amount is lower by c.0.2mt than that which was apportioned from the 2001-2016 guidelines and which was being planned for in the MCS. For sand and gravel the current annualised sub-national apportionment of 1.0mt is similarly lower than that which was apportioned from the 2001-2016 guidelines and which was being planned for in the MCS. Accordingly for both aggregates the cumulative amounts that would be required to meet the sub-regional apportionments are commensurately lower.

2.3.7 However, the operative amounts for forward planning in the MLP are now the lower amounts that are identified in the second LAA for the county (1.6mtpa for crushed rock and 0.83mtpa for sand and gravel). These amounts again lower the total amounts to be planned for.

2.3.8 The second LAA amount is the average of 10 years’ production (2003 – 2012). However, LAAs are to be prepared annually by MPAs and the MASS guidance also requires MPAs to give consideration to the average of the last three years’ production in order to identify any short term trend that would warrant the use of a different amount for planning purposes. For crushed rock the three year average is currently 1.23mt; this is consistent with production over the last 4 years since 2008 and therefore includes the effect of the economic recession and the mothballing of Drybrook Quarry. Taking account of both averages therefore, it would seem appropriate and robust currently to plan on the basis of 1.6mtpa for crushed rock bearing in mind that production (average 1.85mt) between 2003 and 2008 exceeded this level.

2.3.9 For sand and gravel the three year average for the period 2010-2012 was marginally higher than the 10 year average at 0.84mt but it is considered that this small increase is not yet enough to require reconsideration of the use of the 10 year average amount.
2.3.10 This view is supported by 10 year average (2002-2011) confirmed in the first LAA which was 0.85mt. Therefore both the 10 year averages to 2011 and 2012 in the LAA and the most recent three year average trend shows a fairly consistent sales pattern to now. On this basis the 0.83mtpa is considered currently to represent a reasonable amount on which to base future provision.

2.3.11 Sales will continue to be monitored to see if there are any signs of an increase in demand that would warrant a review of the amounts being planned for in the MLP.

The future share of provision between resource areas in Gloucestershire
Crushed Rock

2.3.12 The proportional split between the two crushed rock resource areas of the Forest of Dean and the Cotswolds has been approximately 70:30 for many years; these were the proportions being used in the preparation of the MCS. The current evidence for the % share of sales still shows an approximate 70:30 split between the two resource areas. In 2011 and 2012 the percentage share of sales in the FoD was still over 70%.

2.3.13 These proportional contributions are therefore still considered to be a valid and appropriate consideration in planning for future crushed rock supplies in Gloucestershire. The situation will continue to be monitored but a mechanism will be identified in the MLP to determine when a future review of the plan will be required.

2.3.14 Table 5 shows the future requirements to 2030 and to 2040 for the two resource areas when based on a 70:30 split in proportional contribution to need. It is evident that overall the county has just enough stone within permitted areas to maintain a level of production of 1.6mtpa until 2030 but additional resources would need to be found to maintain a steady and adequate supply of aggregates to 2040.

2.3.15 In each resource area, however, the situation is different with shortfalls of 2.06mt being calculated for the Forest of Dean for the period to 2030 and 15.07mt overall for the county for the longer term to 2040. What this demonstrates is that the county’s reserves are unevenly distributed with regard to supply patterns; at 2012 the Forest of Dean had 61% of the reserves and 39% were in the Cotswolds. When combined with the uneven distribution of reserves between individual quarries within the resource areas this further complicates the assessment of when supply patterns might fall into difficulty. This is discussed in detail in the LAA Baseline Report (November 2013).
Sand and Gravel Resource Areas

2.3.16 Regarding the locational strategy for the supply of sand and gravel, Preferred Option (MPO5b) proposed a preference towards future working in the UTV. This received qualified support during the 2008 consultation exercise into the preferred options and subsequently the County Council indicated its intention to consider this further. But, and notwithstanding the constraints and infrastructure limitations of the area, the potential value of some limited working in the Severn Vale was also recognised. However, no proportional split between the two resource areas was proposed and no preferred areas for working were identified, the county indicating that a criteria based approach would be used for these reserves in the MCS.

2.3.17 Since 2008 and in response to the County Council’s ‘Call for Sites’ potential working areas for sand and gravel have been put forward for inclusion in the MLP. In addition planning applications have been made for further working in both resource areas, but again the UTV is the focus of industry’s attention. In recognition of the views expressed in the consultation exercise and the County Council’s acknowledgement that subject to environmental acceptability some small scale operations might be beneficial in the Severn Vale, to help ensure local supply, it is now considered prudent to provide for a limited contribution to supplies from this area. For indicative purposes if a 2% contribution to supplies was to be formally made outside the UTV this would represent a requirement for only 0.3mt of reserves to 2030 or around 20000tpa.

2.3.18 The current policy approach in the MLP is that the main focus for provision should still be the UTV while acknowledging that some local supply may still come from and be required from elsewhere, mainly from the Severn Vale. With a low landbank for sand and gravel the future pattern of supply will require careful monitoring by the County Council. Currently the sand and gravel landbank of reserves in Gloucestershire is only just over 6mt. It is therefore imperative that new provision is made to ensure a steady and adequate supply of these aggregates. The MLP needs to find at least an additional 8.92mt of reserves to 2030 and a further 5.81mt to maintain a 7 year landbank beyond the end of the plan period i.e. in the period 2030-2037.

2.3.19 In conclusion, however, it is considered that as yet there is insufficient evidence to warrant a formal subdivision of provision for sand and gravel in the county but the discussion above provides the likely scale of provision that could be made from alternative areas to the UTV.

The appropriate period for the provision of crushed rock

2.3.20 This particular issue was discussed in the March 2008 MCSA and MCS-B Technical Papers but at that time it was considered in relation to potentially extending the period for provision beyond the end date for the...
MCS which was then 2026. The end date of the MLP is now 2030, which is 15 years from its anticipated adoption date, thus the consideration is whether provision should extend beyond this date.

2.3.21 The guidance in the NPPF requires planning authorities to draw up local plans for an appropriate time scale, preferably a 15 year horizon, and to take account of longer term requirements. In addition the NPPF also requires MPAs to plan for a steady and adequate supply of aggregates and to make provision for the maintenance of a crushed rock landbank of at least 10 years for crushed rock and 7 years for sand and gravel. The County Council's interpretation of these requirements is that planning to 2040 would therefore achieve the desired long term planning objective and a steady and adequate supply of crushed rock.

2.3.22 Notwithstanding that the required future provision will be monitored and assessed through the LAA process, the MLP review does need to identify now how provision can be made in the future. Clearly the requirements for the plan period up to 2030 need to be identified and provision and proposals made as to how the required resources might come forward. Bearing in mind the uneven distribution of reserves between sites and resource areas and the productive capacity issues that could arise from this it would not be appropriate just to plan for the gross requirement to 2030; the section below on deliverability therefore covers these issues.

2.3.23 With regard to maintaining a rolling landbank of 10 years for crushed rock, this is slightly more complicated. Currently the overall landbank is 18.58 years (29.73mt ÷ 1.6mtpa) or 16.2 years for the FoD (18.1mt ÷ 1.12mtpa) and 24.23 years (11.63mt ÷ 0.48mtpa) for the Cotswolds. Notwithstanding deliverability issues Table 9 demonstrates that there is a potential countywide shortfall in 8.5 years time by c. 2021 but that a shortfall could emerge in only 6.2 years in the FoD and after 14.23 years in the Cotswolds.

<table>
<thead>
<tr>
<th>Resource Zone</th>
<th>A - Reserves as at end 2012 (mt)</th>
<th>B - LAA sales rate (mtpa)</th>
<th>C - Amount for a 10 year landbank B x 10 (mt)</th>
<th>D - Remaining reserves A-C (mt)</th>
<th>E - Time from end 2012 until a 10 year landbank is not evident (years) D ÷ B</th>
</tr>
</thead>
<tbody>
<tr>
<td>FoD</td>
<td>18.10</td>
<td>1.12</td>
<td>11.2</td>
<td>6.9</td>
<td>6.2</td>
</tr>
<tr>
<td>Cotswolds</td>
<td>11.63</td>
<td>0.48</td>
<td>4.8</td>
<td>6.83</td>
<td>14.23</td>
</tr>
<tr>
<td>County</td>
<td>29.73</td>
<td>1.6</td>
<td>16</td>
<td>13.73</td>
<td>8.5</td>
</tr>
</tbody>
</table>

2.3.24 Given that the MLP might potentially be adopted in 2016 it can be demonstrated now by reference to Table 9 that a review of the plan.

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30 NPPF Paragraph 157
31 NPPF Paragraph 145
requirements for crushed rock would be required almost immediately. Given the amount of time and effort in terms of resources and process that a plan has to go through it would seem appropriate, at the very least, to indicate broadly what provision is required now in order to maintain the 10 year landbank for crushed rock in the period post 2030. The plan therefore indicates the provision for crushed rock in the period post 2030 as the landbank shortfall will fall within the plan period and is likely to occur before any review of the plan can be completed as far as possible.

2.3.25 With regard to maintaining a rolling 7 year landbank for sand and gravel, the current landbank is only 7.25 years (6.02mt ÷ 0.83mtpa) which, as no new reserves have recently been permitted, indicates that very soon the county will not have the required landbank. Although in theory providing for an additional 8.92mt would be sufficient for production to 2030 at 0.83mtpa, it would secure a 7 year landbank only up to 2023. To achieve a 7 year landbank post 2030 this plan therefore currently identifies a requirement for a further 5.81mt (Table 8).

**Deliverability**

2.3.26 This embraces the consideration of the geological extent and nature of resources and reserves; the control of these by quarry companies and the existing and potential productive capacity when compared to the anticipated production requirements of the MLP.

2.3.27 From the information above it is evident that overall the county has just enough permitted reserves of crushed rock to last to 2030 at a production level of 1.6mtpa, with a small surplus being evident in the Cotswolds, but not sufficient reserves to last to 2040 in either area. For sand and gravel, however, the situation is even more serious with permitted reserves overall that are sufficient for production only to c. 2020.

2.3.28 In addition to identifying resources of aggregates that in theory will help to maintain a steady and adequate supply, it is also necessary to ensure that sufficient productive capacity is available to meet this objective for the plan period, taking account also of the need to provide the desired rolling landbanks. The countywide reserves initially indicate if this is possible when they are compared to forecast production levels but the ability of the industry to meet these requirements is also dictated by the productive capacity of individual workings balanced against the remaining reserves at each site. An indication of the productive capacity of the county’s quarries is given in the LAA Baseline Report.

*Crushed Rock*

*Forest of Dean*

2.3.29 Table 6.1 in the LAA Baseline Report (November 2013) shows that in the FoD productive capacity has effectively been reduced as a result of Drybrook Quarry being mothballed in 2008. Should this not reopen then
currently all production requirements would fall upon the remaining two quarries, one of which, Clearwell and Stowe Hill Quarry has a permitted life of only 12 years (to 2025) and a maximum permitted output of only 0.6mt. At this level of output permitted reserves are estimated to be sufficient for production for a further 3-5 years only.

2.3.30 The other active quarry, Stowfield and Rogers has permitted reserves that are sufficient for production to beyond 2030 but at a permitted level of only 0.8mtpa. The implementation of approved highway improvements will potentially enable the quarry to produce up to 1.2mtpa but currently there is no indication that these will be carried out.

2.3.31 Currently therefore the combined maximum permitted productive capacity of the two active quarries is in the order of 1.4mtpa which exceeds the 1.12mtpa that might be expected from the FoD at a 70% contribution to a forecast countywide production level of 1.6mtpa. If demand exceeds the forecast for Gloucestershire or the proportion of supplies met by FoD quarries increases due to a fall in the contribution made by Cotswold crushed rock quarries, these two quarries will be unable to meet supplies without an increase in their permitted outputs but this possibility would be offset to a degree should Drybrook Quarry be reactivated.

2.3.32 Reported production capacity for Drybrook is in the order of 200,000-350,000 tpa and as this is a level that is restricted by operational capacity and not by a planning condition, changes to plant capacity/quarry practice could increase this if the company believes that the market and permitted reserves would support it. This uncertainty may continue for some time but could be resolved in the near future because the planning permission expires in 2014. Recent discussions suggest that the company (Hanson) is considering its options as to how to seek an extension of time to work the remaining reserves at this site. Even if Drybrook Quarry does re-activate it is not clear whether sufficient reserves exist for the duration of the plan period.

2.3.33 In the event that Drybrook Quarry permanently ceases to operate, because of the absence of a valid planning permission, then crushed rock aggregates production in the FoD post 2014 is likely to continue at the two other quarries but if Clearwell and Stowe Hill Quarry does not increase its permitted reserves in the near future then Stowfield Quarry in the Wye Valley AONB will be the only production site post c.2018 and this currently has a permitted output level of only 0.8mtpa up to a maximum of 1.2mtpa subject to highway improvements being completed.

2.3.34 From all these considerations it is believed that an effective contribution to supplies and the maintenance of productive capacity in the FoD can be achieved for the plan period and beyond only by additional reserves being permitted and consultation options for this are included in the draft
Plan. An additional consideration with regard to productive capacity is that the NPPF advises MPAs to ensure that large landbanks bound up in very few sites do not stifle competition. In the FoD this is likely to be the case post c.2018 because by then permitted reserves are likely to be held by only one quarry unless additional reserves elsewhere are identified.

**Cotswolds**

2.3.35 Table 6.1 of the LAA Baseline Report (2013) shows that in the Cotswolds the two significant active crushed rock quarries (Huntsmans and Daglingworth) have planning permissions that will last well into the plan period and in the case of Daglingworth Quarry potentially until 2042. The quarries also have a joint productive capacity in the order of 0.6mtpa though this is not limited by planning condition and could therefore increase. Historically these quarries combined with a small contribution of crushed rock aggregates from predominantly building stone quarries have produced about 30% of the county’s annual crushed rock output and should this contribution not change then it would be equivalent to c.0.48mtpa (i.e. 30% of 1.6mtpa).

2.3.36 Accordingly the quarries’ joint productive capacity is likely to be able to maintain their proportional contribution to supplies of crushed rock aggregate, provided each has sufficient permitted reserves. These cannot be disclosed because of commercial confidentiality but in the case of Daglingworth they are believed to be substantial. In the case of Huntsmans Quarry, existing reserves are estimated to be sufficient for production to 2026, if production levels do not increase, which is the expiry date of the extant planning permission, thus if this proves to be the case the productive capacity of the Cotswolds resource area in the longer term would be restricted to that provided by Daglingworth Quarry.

2.3.37 If there is sufficient plant capacity at Daglingworth any shortfall in productive capacity from the exhaustion of reserves at Huntsmans Quarry could be made up from increased production at this unit but the operators have previously stated that its capacity is only c.250,000tpa thus to offset the loss of Huntsmans Quarry the plant capacity at Daglingworth would have to be doubled. This requirement might not be justified by the future market for Cotswold limestone aggregates or the permitted reserves themselves might not prove to be sufficient to warrant further investment at the quarry. This is very unlikely as the stone worked at Huntsmans is of a quality which means it can be used for slightly more enduses than the stone at Daglingworth. Also the distances between the quarries means that they serve slightly different markets across the Cotswolds.

2.3.38 From discussions with the operator it is understood that much of the reserve at Daglingworth Quarry is beneath the plant. However, it is also

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32 NPPF Paragraph 145
understood that it is the company’s long term aim to relocate the plant to access this currently unworkable rock, although it has been stated that this investment would only be viable if done in conjunction with working additional limestone resources currently in the adjoining preferred area.

2.3.39 Daglingworth and Huntsmans Quarries serve a more localised market area than the FoD quarries and currently do not face the same competition from other Carboniferous limestone supply areas as do the quarries in the FoD. In the event that Daglingworth was to become the only Jurassic aggregates quarry this would concentrate the landbank of Jurassic crushed rock reserves at only one site thus potentially stifling competition in this particular aggregates market.

2.3.40 From all these considerations it is believed that the continued operation of the two existing quarries in the Cotswolds will achieve an effective contribution to supplies of Jurassic aggregates and thus the maintenance of productive capacity in the Cotswolds in the period to 2026. In the event that one or both sites require additional reserves to continue operating beyond then these could be realised by permitting additional reserves within the preferred areas that lie adjacent to these quarries. Possible options for this are identified in the consultation on the plan.

Sand and Gravel

2.3.41 The distribution of sand and gravel resources in the county and their usefulness is dictated by geological factors. In the UTV, resources have been extensively worked for many years and they are the county’s principal source of these unconsolidated aggregates. A comprehensive range of products are made at source or are manufactured from these aggregates at associated and well established value added plants which make concrete products such as paving slabs and blocks.

2.3.42 The industry has invested heavily in this area and the County Council has planned for its development through its adopted MLP and the identification of preferred areas for further extraction. Significant highway improvements have also facilitated relatively easy access to markets in Gloucestershire and further afield. This concentration of extraction has resulted in the Cotswold Water Park (CWP) an important environmental and recreational resource that has been successfully managed by the CWP Management Committee (in the past) to integrate afteruses with mineral extraction.

2.3.43 This has not been achieved without some losses though, principally the large area of agricultural land that has been worked and the necessary adjustments to parts of the PROW network. Although the industry has demonstrated its ability to coexist with local communities and restore exhausted quarries predominantly to a wet afteruse it could be argued that the UTV has had more than its fair share of the inevitable disruption caused by mineral extraction. Importantly in this area, the restoration of
existing and potential workings in close proximity to RAF Fairford is
affected by the requirement not to increase the risk of birdstrike to
aircraft. This means that additional quarrying in some areas with a high
water table would have to be restored to a dry condition that would not
be attractive to birds.

2.3.44 There are two methods of achieving this; the first is by pumping wet
voids in perpetuity and the second is to backfill the voids with inert
wastes to restore land to a level above the water table. However,
because of the high levels of silt in the sands and gravels in some
locations the working process does actually result in significant levels of
dry restoration from silt lagoons at some quarries. These considerations
are dealt with in the section discussing restoration in the companion
evidence paper on Planning and Environmental Considerations but it is
sufficient to say here that the inevitable conflict between the trinity of
aircraft safety, restoration objectives and the need for sand and gravel
creates a potential obstacle to further extraction in some parts of the
UTV.

2.3.45 It is also the case that there are significant compositional differences
between the deposits in the UTV and Severn Vale, the latter’s more
siliceous aggregates being favoured in some applications. The deposits
in the Severn Vale were once widely quarried though at small scale level
but today only two active quarries remain operational, the industry having
become concentrated in the UTV. River terrace deposits are widespread
in both of these resource areas but they are also to be found near
Moreton-in-Marsh in the northeast of the county though the deposits
here, which tend to be thin and have a high clay content, are believed to
be of little commercial value today and there has been no working here
since the 1970s.

2.3.46 There are also extensive suballuvial gravels in both the Severn Vale and
in the UTV, some of which are worked but these are saturated and
require wet working and are of variable thickness. Much of the resource
in the Severn Vale has been built over but substantial workable deposits
are believed to still be present. Working there offers the opportunity to
reduce the intensity of further working in the UTV and to avoid potential
conflict with the operation of Fairford Airfield but the Severn Vale
deposits are generally not so accessible by road and are further away
from some of the markets served by the UTV. Quarries in the Severn
Vale would, however, be potentially better placed to serve Gloucester
and Cheltenham than the UTV which has a transport advantage for
serving the eastern side of the county and construction markets in
Oxfordshire, Wiltshire and Swindon.

2.3.47 Currently the strategic provision of sand and gravel in Gloucestershire is
associated with the UTV. This is likely to remain the case whilst the
majority of permitted reserves and preferred area resources are located
there and the area continues to provide most of the sand and gravel extracted in the county.

2.3.48 The industry favours the UTV and landowners there have indicated their intention to release substantial areas of land for further extraction e.g. Down Ampney. The same cannot be said for the Severn Vale or other sand and gravel resource areas in the county although the Council’s ‘Call for Sites’ has resulted in sites in the Severn Vale being put forward for consideration and there is a planning application currently being processed by the County Council for extraction at Pages Lane at Twyning. If this is the only demonstration of deliverability in areas outside the UTV then in the immediate future there is little incentive for the Council to depart significantly from the historic supply pattern. However, the MLP affords the opportunity to look further ahead to 2037 and potentially to consider whether there needs to be a change in the balance of supplies between resource areas if this will still maintain a steady and adequate supply of aggregates and will be beneficial and environmentally acceptable.

2.3.49 The County Council’s response to the Preferred Options consultation in 2008 was to take account of the recent supply pattern which is strategically centred on the UTV resource area but to acknowledge that local supply is important and will be required from the Severn Vale. However, the small scale contribution to supplies and the potential constraints suggest that any potential provision would be relatively limited and that a criteria based approach to further working in the Severn Vale should be taken forward as it was debateable whether the area warranted the identification of preferred areas.

2.3.50 In terms of current and future supplies the importance of the UTV compared to the Severn Vale has not changed significantly in the interim and therefore, in principle, the criteria based approach is still considered to be valid for such areas. Should supplies from the UTV be reduced or become too constrained by factors that limit extraction and industry seeks to develop the Severn Vale to compensate then a more definitive strategy for identifying potential extraction areas there might then be appropriate. Evidence currently suggests that the UTV is likely to be the main source of supply for the plan period at least to 2030.

Upper Thames Valley (UTV)

2.3.51 Until recently the UTV had five significant quarries but with the closure of Horcott Quarry in 2012 only three active quarries, Manor Farm; Thornhill and Dryleaze and one inactive site (Cerney Wick) remain. Table 10, which is based upon Table 6.2 in the LAA Baseline Report (November 2013), shows the anticipated life of these sites and their productive capacity from which it can be seen that the active sites in the UTV currently have a productive capacity in the order of 0.85mtpa. This would be sufficient to meet a future production rate of 0.83mtpa as
identified in the second LAA but this could be maintained only until about 2016 when it is estimated that most of the reserves will be exhausted. It is therefore evident that additional reserves will need to be provided at new sites or as 'extensions' to all or some of these units if production from this strategic resource area is to be maintained.

2.3.52 Additionally a small site at Spratsgate Lane could become active before then, pending the outcome of a planning application following judicial proceedings that quashed an earlier permission. This site would have a productive capacity of about 0.09mtpa but because of a small reserve this might only be for the period 2014-2018. If this was to happen soon the active sites in the UTV would then have a combined annual capacity of almost 0.95mtpa to 2016.

2.3.53 The inactive Cerney Wick quarry has a productive capacity of 0.35mtpa and once it becomes operational it will have an estimated life of c.10 years but as it is controlled by the operators of Dryleaze Farm who do not intend to work it until after quarrying ceases at this site, its contribution to capacity will be delayed until after c.2016. In the event that Spratsgate Lane does not come on stream and reserves are exhausted at the active quarries this would mean that the UTV would have a production capacity of only c.0.35mtpa post 2016. Outside the UTV the productive capacity of the small, active sites is estimated to be only about 0.05mtpa.

2.3.54 However, awaiting determination are two planning applications for quarrying sand and gravel in the UTV and there are proposals for small scale quarrying in the Severn Vale which, if all were to be approved would together add significantly to the overall landbank of permitted reserves and annual productive capacity.

2.3.55 The two live planning applications for extraction span the county’s boundary with Wiltshire. The largest of these at Down Ampney is on unallocated land in Gloucestershire but on preferred area land in Wiltshire; a smaller application at Wetstone Bridge occupies a preferred area in Wiltshire but unallocated land in Gloucestershire. Subject to the necessary planning permissions these two sites would have a combined reserve yield of 6.3mt but only about half (3.28mt) would be won from Gloucestershire. Their combined productive capacity would be up to 0.6mtpa. However, because of the intention to phase working across the county boundary it is not possible to determine with precision what the productive capacity might be in each area during the operation of these sites.

2.3.56 Table 10 shows details of sand and gravel sites in Gloucestershire. If all active sites were to cease by the dates shown and Cerney Wick then became the only active site, productive capacity in the county could be only c.0.35mtpa between c.2016 and 2026. In the event that Cerney
Wick and the proposed sites that are the subject of a planning application (Down Ampney/Wetstone Bridge/Spratsgate Lane and Twyning) were to become operational by 2016, however, their combined productive capacity would then be potentially as much as 1.06mtpa and countywide reserves would be in the order of c. 6.6mt (2012 reserves (c. 6mt) minus 3 years’ production between 2013 and 2016 at c. 0.8mtpa plus c. 3mt from proposed sites). Productive capacity under these assumptions would then be slightly more than the identified 10 years’ sales average of 0.83mt but reserves would neither be enough for production requirements through to 2030 (14.94mt required) nor for production to 2037 (20.75mt required) thus supporting the view that the MLP should address the provision of longer term reserves now. Moreover, under this extreme scenario the majority of reserves and capacity would still be held at only a few sites (Cerne Wick, Down Ampney and Wetstone Bridge) to about 2026 because the much smaller sites at Spratsgate Lane and Twyning (subject to obtaining planning permission) would probably have been worked out long before 2020.

2.3.57 However, should the recently submitted planning application for an extension to Manor Farm Quarry be approved this would potentially increase productive capacity and overall reserves by c.0.3mtpa and 3.2mt respectively.

2.3.58 Potentially there are unworked parts of preferred areas that are identified in the 2003 MLP at Horcott/Lady Lamb Farm and Thornhill Farm (AKA Claydon Pike/Coln Quarry) and which could contribute reserves to future supplies. These, along with some additional proposed sites, are identified in the Site Options consultation document.
### Table 10 Active, Inactive and Proposed Sand and Gravel sites

<table>
<thead>
<tr>
<th>Operator</th>
<th>Site</th>
<th>Productive Capacity (mtpa)</th>
<th>Permitted and (Proposed) Reserves in Gloucestershire (mt)</th>
<th>Estimated Life until year</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active Sites UTV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aggregate Industries</td>
<td>Manor Farm</td>
<td>0.3</td>
<td></td>
<td>2015/2016</td>
</tr>
<tr>
<td>Hanson</td>
<td>Thornhill Farm</td>
<td>0.3</td>
<td></td>
<td>2015</td>
</tr>
<tr>
<td>Hills</td>
<td>Dryleaze Farm</td>
<td>0.25</td>
<td></td>
<td>2016</td>
</tr>
<tr>
<td><strong>Sub total UTV</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>0.85</strong></td>
</tr>
<tr>
<td><strong>Active Sites non UTV</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Moreton C Cullimore</td>
<td>Perry Way</td>
<td>0.03</td>
<td></td>
<td>2015/2016</td>
</tr>
<tr>
<td>Elliot &amp; Sons</td>
<td>Shurdington</td>
<td>negligible</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Allstones</td>
<td>Bromsberrow</td>
<td>negligible</td>
<td></td>
<td>-</td>
</tr>
<tr>
<td>Grundon</td>
<td>Wingmoor Farm</td>
<td>negligible</td>
<td></td>
<td>2014</td>
</tr>
<tr>
<td><strong>Sub total non UTV</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>0.03</strong></td>
</tr>
<tr>
<td><strong>Total Active Sites</strong></td>
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<td><strong>0.88</strong></td>
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<tr>
<td><strong>Inactive Sites (with pp) UTV</strong></td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hills</td>
<td>Cerney Wick</td>
<td>0.35</td>
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<td>10 years from start</td>
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<tr>
<td><strong>Total Inactive Sites</strong></td>
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<td></td>
<td></td>
<td><strong>0.35</strong></td>
</tr>
<tr>
<td><strong>Total Active and Inactive sites</strong></td>
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<td></td>
<td><strong>1.23</strong></td>
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<tr>
<td><strong>Proposed Sites UTV</strong></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Aggregate Industries</td>
<td>Manor Farm Extension∆</td>
<td>0.3</td>
<td>3.2</td>
<td>11 years from start</td>
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<tr>
<td>Hanson</td>
<td>Down Ampney+</td>
<td>0.45</td>
<td>3.28***</td>
<td>12 years from start*</td>
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<tr>
<td>Moreton C Cullimore</td>
<td>Wetstone Bridge+</td>
<td>0.09</td>
<td></td>
<td>10 years from start**</td>
</tr>
<tr>
<td></td>
<td>Spratsgate Lane++</td>
<td>0.09</td>
<td>0.3</td>
<td>4 years from start</td>
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<tr>
<td><strong>Sub total UTV</strong></td>
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<td><strong>0.93</strong></td>
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<td><strong>Proposed Sites non UTV</strong></td>
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<td>Twyning+</td>
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<td>1-2 years</td>
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<tr>
<td><strong>Sub total non UTV</strong></td>
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<td></td>
<td><strong>0.08</strong></td>
</tr>
<tr>
<td><strong>Total Proposed Sites</strong></td>
<td></td>
<td></td>
<td></td>
<td><strong>1.01</strong></td>
</tr>
</tbody>
</table>

∞ Sites that are subject of planning applications/EIA scoping reports by applicants
+ Planning application submitted
∆ Application submitted
++ Submitted planning application being reconsidered after planning permission was quashed by High Court
* Site also includes land and proposed reserves in Wiltshire. Life of site in Gloucestershire would be about 6 years
** Site also includes land and proposed reserves in Wiltshire. Life of site in Gloucestershire would be about 7 years
*** Reserves in Gloucestershire but applications include additional reserves in Wiltshire
Severn Vale

2.3.59 In the Severn Vale there are only two operational sites working relatively small reserves. A further site at Wingmoor Farm has some reserves but the permission to work these expires in 2014.

2.3.60 The solid sand and gravel pit at Bromsberrow is a very small producer of sand. The aggregate produced here is, however, used for pipe bedding and asphalt and the quarry is not a source of the type and range of aggregates that are produced at the main sand and gravel workings in the county. However it does have a considerable permitted reserve which although technically part of the sand and gravel landbank does potentially distort the overall situation in the county which is why the discussion regarding productive capacity above is important.

Resource Areas and conflict with Areas of Outstanding Natural Beauty (AONB)

2.3.61 The issue is relevant to crushed rock and follows on from the above considerations as where best to obtain the required amounts from the two crushed rock resource areas in the county with regard to minimising conflict with environmental designations and interests and to ensure sufficient productive capacity is available for the period of the planned provision. Both resource areas are subject to a range of high level environmental designations and land use constraints that to some degree or another will be affected by quarrying and, as referred to above, the productive capacity of existing quarries within the areas also varies. The location and extent of the constraints are shown on the profiles for the Site Options.

2.3.62 Of particular importance in Gloucestershire is the extensive nature of the Cotswolds and Wye Valley AONBs, in particular the former which covers almost the entire Jurassic Limestone resource.

2.3.63 The distribution of resources and their usefulness is dictated by geological factors. Within the two resource areas in the county i.e. the FoD and the Cotswolds, the geology is such that the principal source of aggregates is the FoD where the crushed rock aggregate resource that is favoured by industry (Carboniferous Limestone) is to be found locally. The quarrying industry has nevertheless also developed, but to a lesser extent, the Jurassic limestones of the Cotswolds. As stated earlier, these have fewer aggregate enduses but they do offer an alternative specification and variation that some sectors of the aggregates market prefer to Carboniferous aggregates. The resource area is also on the eastern edge of the county which therefore has transport distance advantages over the Carboniferous limestone aggregates for some local and adjacent market destinations.

2.3.64 Potentially the quarries in the two resource areas could, and to a limited extent already do, compete in some common sectors of the construction
industry market as there is some overlap in terms of enduses and the location of markets. Because of transport distances and the difference between the two types of limestone, which means there are enduses that are peculiar to each type of resource, their markets are generally distinct from each other. The continuation of supplies from both areas will nevertheless have commercial benefits but importantly it will also spread the environmental load of crushed rock quarrying within the county.

2.3.65 A combination of the various commercial factors (enduses, technical specifications, market location and level of demand for the commodities that are produced) has manifested itself as the 70:30 split in production between the two areas. Whilst almost the entire Jurassic limestone resource lies within the Cotswolds AONB, thus offering virtually no scope for the further extraction of Jurassic limestones without ‘conflict’ with this designation, the Wye Valley AONB in the FoD covers only part of the Carboniferous limestone resource. However, one of the three most recently active quarries there (as at 12/2012 there were two active quarries and one mothballed quarry) lies within the AONB (Stowfield) and of the three quarries it is understood that this quarry has the largest reserves and the longest permitted life. Thus even within this resource area there is still the potential for conflict with an AONB.

2.3.66 The NPPF requires MPAs, as far as is practical, to provide for the maintenance of landbanks of non energy minerals, such as aggregates, from outside AONBs. But all of the 30% share of the county’s production from the Cotswolds is provided by quarries within the Cotswold AONB whereas only a proportion of the FoD’s 70% share of production has historically come from within the Wye Valley AONB (the exact amount is confidential). Following the closure of Drybrook Quarry in the FoD, production from this resource area has been split between two quarries, only one of which (Stowfield) in the Wye Valley AONB. Moreover, as can be seen from Table 5, about 39% of the county’s crushed rock reserves are within the Cotswolds AONB. Only a proportion of the 61% of crushed rock reserves in the FoD lie within the Wye valley AONB (at Stowfield Quarry) but the exact amount of these cannot be published for reasons of commercial confidentiality. Although from previous years when the figure could be published the estimate of crushed rock aggregate resources within an AONB designation were c. 80%.

2.3.67 The scope for transferring future supply of crushed rock aggregate within Gloucestershire is limited. For the Cotswold resource area there are very limited resources outside the AONB and in any event there is no history of strategic working of these resources. Therefore once current reserves are exhausted there is only the option of further supplies from within the AONB or from other more distant and possibly unsuitable resource areas. With regard to the FoD there are some non AONB resources but these are limited

33 NPPF Paragraph 144
2.3.68 The preferred areas that are identified in the adopted MLP are planning allocations that were justified, accepted and tested through a Public Inquiry process at the time and they have since formed the foundation of quarry developments in the county, both within and outside the AONBs. The preparation of the new MLP affords the County Council and stakeholders an opportunity to consider the appropriateness of these former allocations in going forward, in light of current government policy/guidance and their suitability for quarrying in today’s commercial and environmental climate and the need for any additional preferred areas or other ‘allocation’s that might be appropriate to secure an appropriate contribution to meeting national and local demand for crushed rock and a steady and adequate supply.

2.3.69 If the County Council sought to provide the entire future crushed rock production requirements for the county from sites outside the two AONBs, following the exhaustion of permitted reserves, then this shift would impose a major environmental load on the resources and communities of the FoD. Geologically the resources are present but this would cause a radical change to supply patterns as well as increasing costs to some consumers due to longer haulage distances.

2.3.70 Notwithstanding these disadvantages, only a limited number of sites within the FoD have been proposed following the County Council’s ‘Call for Sites’ (see site profiles and evidence paper). From this process land at only two non AONB locations has been proposed as being potentially available for quarrying. Therefore the formal identification and allocation of any other non AONB land not proposed by a landowner or operator would cast doubt as to whether it would be a deliverable contribution over the plan period.

2.3.71 Quarries, especially those that produce crushed rock, are generally high investment, fairly long term operations and their spatial distribution in the county has developed over a number of years, with some sites having received lateral extensions that have maintained their presence in a particular location. Although transitory, because the minerals are a finite resource, the operational lives of these sites are measured in decades rather than years and the gestation period for the development of a new site is similarly long term.

2.3.72 Given all these considerations above it may not be practicable or indeed desirable to relocate all of the industry within AONBs to other parts of the county that are not subject to such designations. Moreover, there may be some environmental merit in allowing for the release of further reserves at some sites in established quarrying locations as it may be possible to develop them further without causing unacceptable conflict with landscape or other interests, either by carefully designed lateral spread or by deepening into the resource. Deepening and/or limited
lateral extension offers the opportunity to minimise the quarry’s footprint and visual intrusion which may be further ameliorated by suitable landscaping.

2.3.73 New crushed rock quarries in ‘greenfield’ locations are an uncommon occurrence, with industry generally favouring the extension of existing, suitable workings either by lateral spread and/or by deepening. The development of existing quarries to meet demand is preferred for both commercial and environmental reasons although a quarry in a new location may be able to offer the same or greater advantages.

2.3.74 Clearly all of these issues will need to be considered by the County Council through the preparation of the Plan and through the outcome of the Options Consultation process as to what site provision is taken forward in the MLP.

**Sub-regional Review and Assessment of Alternative Supplies of Primary Aggregates (Potential contributions from other supply areas to offset production in Gloucestershire)**

**Crushed Rock**

2.3.75 This particular issue, in relation to crushed rock, was being explored by the South West Regional Assembly (SWRA) with regard to potential shortfalls in the supply of crushed rock aggregates from the Carboniferous limestones of the Forest of Dean. The County Council had considered that these might arise because of possible difficulties in being unable to find suitable sites for further mineral extraction; the issue features in Preferred Option MPO3b of the MCS. These limestones are, however, widely available in MPAs close to the county to the south of Gloucestershire where landbanks of permitted reserves and the productive capacity of quarries are substantially greater than those in the county. Details of the situation in neighbouring south west MPAs are given in the Gloucestershire second LAA and Baseline Report (November 2013).

2.3.76 Quarries in South Gloucestershire, North Somerset and Somerset are known to market aggregates in Gloucestershire and in other markets further afield some of which are also served by quarries in the FoD. It is therefore reasonable to conclude that any shortfall in the productive capacity of the county’s quarries and thereby an inability to meet a particular share of future demand in Gloucestershire could result in quarries elsewhere, principally those in nearby South Gloucestershire, increasing their share of supplies to the local construction market and also to those other market areas that are served by Gloucestershire’s quarries.

2.3.77 Preliminary investigations had been carried out by the SWRA into the possibility of MPAs actually agreeing to plan for a lower share of regional production from the FoD with this being offset by a higher level of
production from the reserve rich areas. This was being considered in the expectation that future provision from the FoD might be problematic, for instance because of AONB considerations, and that if shortfalls became apparent in Gloucestershire, quarries nearby would automatically endeavour to meet any resultant shortfall in supplies from their large existing reserves.

2.3.78 Crushed rock quarries are also present in other MPAs elsewhere e.g. the West Midlands, but these are of less significance with regard to their potential to supply the construction markets in Gloucestershire. However, quarries in the export markets served by Gloucestershire’s quarries will be competing for the same custom and in this case those quarries will have more of an influence on the output from the county’s quarries.

2.3.79 This strategic approach to the supply of aggregates has, however, faltered with the abolition of the SWRA, although under the Duty to Co-operate dialogue has and will continue between the Council and other MPAs on the supply of crushed rock. Under the Duty, which came into force in November 2011, planning authorities are required to co-operate in maximising the effectiveness of plan making in relation to strategic matters which have been defined as sustainable development or use of land having a significant impact on at least two planning areas. Additionally, the NPPF notes that joint working “should enable local planning authorities to work together to meet development requirements which cannot wholly be met from within their own areas.”

2.3.80 However, the prospect of other MPAs being willing to plan for supplies to offset shortfalls in the county is now more unlikely given the guidance in the NPPF and MASS on the contributions that are expected from MPAs. The County Council has nevertheless endeavoured to assess the scope for this approach and has had dialogue with all adjacent MPAs but the principal MPAs that are relevant to such a change in supplies, South Gloucestershire and North Somerset Councils, have already identified their anticipated future contributions to supplies in their LAA and MLPs and this does not include making specific provision for any shortfall that may arise in Gloucestershire. The County Council has therefore continued to prepare a plan that will seek to provide the contribution to national and local supplies that has been identified in the LAA from areas in Gloucestershire that reflect the county’s environmental circumstances. This will need to be tested through the preparation of this Plan.

2.3.81 Common to the MPAs, however, is the effect of the economic recession which in South Gloucestershire has resulted in the mothballing of quarries such that currently only two are operational. Nevertheless, given the large landbank of active and inactive reserves in South Gloucestershire, as indicated in the LAA Baseline Report (November

34 Paragraph 179 NPPF DCLG March 2012. County Council emphasis
2013), quarries there could potentially help to meet any shortfall arising in Gloucestershire should the industry, rather than the MPA, choose to do so. There seems to be little chance of Option 3b in the MCS being achieved through the MLP process, rather market forces may be more successful in doing this.

Sand and Gravel

2.3.82 This issue was aired in the Preferred Options consultation for the MCS and discussed in the Consultation Response Report of 2008, in as much as a more strategic approach in the county was discussed in relation to adjoining MPAs, specifically Oxfordshire and in areas in the West Midlands. As stated above, the possible involvement of the now defunct SWRA was proposed.

2.3.83 Using only the resources in the county to meet potential shortfalls would be the fall back situation if a wider spatial plan could not be agreed under the 2008 Preferred Option MPO4c for longer term supplies from the UTV as a whole; this would take into account the cross border availability of resources particularly in Wiltshire, Swindon and possibly Oxfordshire. The necessary co-operation between south west MPAs to achieve this would possibly have been be facilitated by the then Regional Planning Body taking a lead on a possible changes to the local apportionments. However, the Local Aggregates Assessment for Gloucestershire has since changed the amount to be provided by the county and the plan period now extends to 2030 with a possible provision for a landbank of reserves to 2037.

2.3.84 Although the Regional Assembly has been abolished, a wider spatial strategy to providing longer term supplies of sand and gravel from the UTV area may possibly be achieved under the Duty to Co-operate. The sand and gravel resources in the UTV, which are split by MPA boundaries, fall squarely within the scope of the duty.

2.3.85 Additionally, the NPPF notes that joint working “should enable local planning authorities to work together to meet development requirements which cannot wholly be met from within their own areas…”

2.3.86 In Wiltshire and Swindon the principal source of indigenous sharp sand and gravel is the UTV. The two MPAs have adopted a plan which proposes the release of additional sand and gravel reserves in the UTV and in the Calne area that would be sufficient to meet a provision of 1.2mtpa to 2026; five sites are allocated within the UTV resource area which together could possibly contribute c. 8.5mt to the existing landbank of permitted reserves. In the UTV the resources are largely contiguous with those in Gloucestershire and they are generally worked or controlled by the same companies with the result that in recent years, as reserves have dwindled in Wiltshire and quarries have ceased production, industry

35 Paragraph 179 NPPF DCLG March 2012. County Council emphasis
has offset a loss in productive capacity by transferring production requirements to Gloucestershire. As a result production in Wiltshire has fallen by about 50% whereas in Gloucestershire it has remained at just under 1mtpa as the quarries in Gloucestershire have taken up the slack in supplies from Wiltshire. These supplies are believed to have been made mainly to export markets in the south east.

2.3.87 In Oxfordshire the MPA’s draft LAA has identified a potential requirement for 1.2mtpa of sand and gravel but this has yet to be ratified by the Council or included for consideration in the Council’s Minerals and Waste Core Strategy which is being re considered following its withdrawal from EIP in 2013; Oxfordshire County Council is now consulting with various organisations including Gloucestershire county Council in order to fulfil its duty to co-operate.

2.3.88 At the time of writing, however, there are still concerns about the level of provision being proposed by Oxfordshire because of the potential implications for supplies from the Gloucestershire part of the UTV. The county has historically exported sand and gravel to Oxfordshire and more recently (post 2008) because of shortfalls in productive capacity in Oxfordshire. It remains to be seen whether the level of provision from Oxfordshire will be increased as a result of the consultations but also of importance to Gloucestershire is the productive capacity of quarries and their location in Oxfordshire because if the productive capacity to the west of Oxford where there are substantial, relatively unconstrained deposits of sand and gravel in the UTV and its tributaries, is allowed to diminish this may encourage exports from the UTV in Gloucestershire for markets in Oxfordshire.

2.3.89 Although a joint approach between Gloucestershire, Wiltshire/Swindon and Oxfordshire to the longer term working of sand and gravel from the UTV has been considered by the Council, through actively seeking and engaging in discussions with its neighbouring MPAs as part of the preparation of the MLP (see accompanying paper on Duty to Co-operate), the opportunity for a formalised joint approach to sand and gravel extraction in the UTV has passed for the time being, at least between Gloucestershire and Wiltshire. The main issue is a mismatch in programmes for plan preparation not least in Wiltshire and Swindon where mineral plans and therefore a strategy for supply for the foreseeable future is set through recently adopted minerals DPDs.

2.3.90 Wiltshire and Swindon Councils have demonstrated to the satisfaction of an Inspector that the MPAs can make provision for future supplies of sand and gravel from their area, mostly from the part of the UTV in Wiltshire. However, assuming that this provision within Wiltshire/Swindon can be met, then the Council subject to achieving provision in line with its own LAA should endeavour to ensure that sufficient provision should be made from the UTV to 2026 at least,
Continued dialogue and co-operation between the MPAs should ensure consistency of approach.

2.3.91 Notwithstanding what might happen in Oxfordshire, it is still desirable for a strategic approach to be taken for the restoration of the existing and future workings in the UTV in Gloucestershire and Wiltshire/Swindon MPAs but it would also make sense for Oxfordshire to be a party to this if the County Council’s plan eventually proposes some degree of extraction in this area. This joint approach would also involve the District Councils and other interested parties.

2.3.92 The County Council has endeavoured to assess the scope for joint working and a joint approach to providing future supplies of sand and gravel with all adjacent MPAs. However, for the time being the authorities have agreed only to a close working relationship. The most obvious area for formal joint working is the UTV but for the reasons discussed above this is not possible at the moment.

2.4 Primary Aggregates Draft Policy Framework

_Crushed Rock_

2.4.1 The information above indicates that the County Council’s strategic and spatial approach to providing for a steady and adequate supply of crushed rock, as set out in MPO3a of the Preferred Options Consultation Response Report 2008, is still valid in 2013 albeit that it requires updating to take account of the issues which have emerged as outlined in this report. What has changed in the interim is that the future requirements for aggregates are now identified through the LAA approach to assessing future demand rather than through the forecasts of the National and Regional Aggregates Guidelines which are now only to be used as a broad indication for Aggregate Working Party purposes. As a result the call on crushed rock resources from the county has therefore eased slightly.

2.4.2 The period of provision, however, has extended because the MLP end date is now 2030 and the total combined permitted reserves of crushed rock in the county now amount to approximately 30mt. In order to provide for a 10 year landbank during and at the end of the plan period i.e. to 2040 additional resources will have to be released for extraction during the Plan period and it is calculated approximately 15mt of crushed rock resources needs to be identified countywide (Table 5). Table 5 also shows that maintenance of the proportional split between the two resource areas of the FoD and the Cotswolds will require additional resources in the FoD in the order of 2mt to 2030 but 13.3mt to 2040.

2.4.3 Of the two quarries in the FoD Stowfield has the largest permitted reserve, estimated to be sufficient for production beyond 2030 but Clearwell's reserves are estimated to be enough for only 3-5 years'
production thus further reserves would be needed in the near future if this quarry is to continue in operation.

2.4.4 The baseline report accompanying the LAA indicates that the existing maximum joint productive capacity of 1.4mtpa at the two active quarries in the FoD (Stowfield Quarry and Clearwell Quarry) has been set by planning conditions. These were imposed because of highway limitations but a possible increase in their combined capacity to 1.8mtpa could be achieved if road improvements are implemented to serve Stowfield. At the present time, however, there is no indication that this will be done so the current joint capacity of 1.4mtpa forms the basis for the quarries’ potential contribution to future supplies albeit potentially for a further 3-5 years. This level of productive capacity exceeds the 1.2mtpa calculated for the area on the basis of the continuation of the 70:30 proportional split in supplies between the FoD and the Cotswolds.

2.4.5 In the case of the mothballed Drybrook Quarry there is no condition limiting its output and if it were to resume operations then this would share the future production requirements between the three quarries. The amount of reserves remaining at the quarry are believed to be limited but an adjoining preferred area from the 2003 MLP could yield an estimated 4.5mt. However, the planning permission expires in 2014 thus if this is not renewed future productive capacity in the FoD will be limited to the two other quarries alone. Once Clearwell Quarry is exhausted in c.3-5 years productive capacity in the FoD could be down to 0.8mtpa, below the capacity requirement of 1.12mtpa.

2.4.6 The environmental constraints in the vicinity of these three quarries, the extent of the current workings and the remaining preferred areas are shown on the site profiles for each site and the accompanying commentary provides an indication of each quarry’s potential for further development. (See Site Options Evidence Paper)

2.4.7 In the Cotswolds resource area the combined productive capacity of the two active crushed rock quarries (Daglingworth and Huntsmans) is not restricted by planning conditions and information indicates that it is in the order of 0.48mtpa. Both sites have considerable permitted reserves and both are associated with adjoining preferred areas from the 2003 MLP. In total the continued operation of the two quarries will be sufficient to meet the calculated 0.48mtpa required from the Cotswolds for the duration of the MLP including a 10 year landbank.

2.4.8 The environmental constraints in the vicinity of these three quarries, the extent of the current workings and the remaining preferred areas are shown on the site profiles for each site and the accompanying commentary provides an indication of each quarry’s potential for further development. (See Site Options Evidence Paper) In addition there are some other suggested sites over and above those considered in Table
6.1 in the LAA Baseline Report; these are also considered in the evidence paper. Whilst these additional sites have come forward through the Call for Sites process none currently contribute to strategic aggregate supply.

2.4.9 In the case of the sites in the FoD this includes one area that is not associated with current quarrying and would represent a ‘greenfield’ site if it went forward. Whilst this site has been included in the Site Options and indeed could provide a significant resource contribution, the fact that it would be a new quarry would mean that the time need to bring it forward would cast doubt on whether it could contribute to supplies in the Plan period before 2030. However, this land has been included for consultation purposes. At this stage no decision has been taken as to any potential site options which should go forward for the Plan.

Sand and Gravel

2.4.10 Since publication of the draft preferred options for the MCS, no overriding case has been identified for changing the Council’s strategic and spatial approach to providing a steady and adequate supply of sand and gravel albeit that updates are required to take account of the issues that may have emerged since and which are outlined in this report. Countywide this would mean an annual amount of 0.83mtpa for the duration of the MLP with provision for a 7 year landbank which would be focused primarily on the UTV. This overall approach for the plan period will maximise resources from the UTV but has to be tempered by the environmental implications of the continued concentration of working there and also the need for some flexibility to provide for sand and gravel elsewhere in the county such as from the Severn Vale which has different but valued construction uses.

2.4.11 The prospect of additional resources becoming available e.g. at Down Ampney and other sites referred to in Table 4 and the proposals for new sites put forward by industry/landowners following the county Councils ‘Call for Sites’ in 2012, which are considered in the Site Options Evidence Paper, together indicate an overwhelming preference for industry to remain in the UTV area for some time. The adopted Aggregates Sites Allocations Plan for Wiltshire also provides for further working in the UTV to 2026, including working resources at one site which are proposed potentially to be processed through an existing quarry in Gloucestershire.

2.4.12 For the MLP therefore, the Severn Vale resources are still considered to be a longer term supply for anything other than a small proportion of overall requirements which for some time now has not exceeded c.5% of annual production. Some parcels of land have been suggested by an operator in part of the Severn Vale near the Worcestershire border; if these sites prove to be suitable for extraction they could release c. 0.75mt, equivalent to about 8% of the additional reserves for provision to
2030. However, these sites are to be tested in the Site Options consultation along with all other sites and no decision on them will be made until all responses have been considered during 2014.

2.4.13 The likely deliverability and consideration of capacity versus the requirements for provision for the plan for both crushed rock and sand and gravel were discussed earlier.

2.4.14 The threshold for maintaining a countywide 10 year landbank for crushed rock would not be reached until c. 2021 based on the current permitted reserves of 29.73mt but these reserves are not evenly distributed between the quarries in the county or between Carboniferous limestone and Jurassic limestone resource areas. Consequently in c. 2018 the productive capacity in the FoD is likely to fall below the required annual amount (1.12mt) and in the Cotswolds it is likely that the required amount of 0.48mtpa would not be maintained after 2027; after these times only one quarry might be operating in each limestone resource area. In both areas, therefore, additional reserves to meet the required annual provision beyond 2030 would appear to be necessary during the plan period; these could be required for the operation of additional sites or to justify any expense (e.g. new processing plant) to achieve a higher productive capacity at the two operating sites.

2.4.15 For sand and gravel, however, the landbank situation is more critical as the reserves in 2012 were only 6.02mt and therefore the threshold for maintaining a 7 year rolling landbank is already being breached. The remaining reserves are also unevenly distributed so much so that around 2016 if no new permissions are approved then potentially there could be a serious deficit in maintaining sufficient productive capacity to achieve the envisaged 0.83mtpa.

2.4.16 There are some planning applications in the system/proposed which if permitted would go some way to maintaining provision. Theoretically therefore it is quite possible that productive capacity in the county could range from c.1.3mtpa, if all are permitted, to only 0.35mtpa if only Cerney Wick operates in any given year from around 2016-2026.

2.4.17 From overall resource requirements there needs to be at least 8.92mt of resources identified in the MLP to provide sufficient supplies to 2030. However, as discussed earlier, there is likely to be a major deficit around 2026/7 therefore sufficient reserves are required to maintain a rolling 7 year landbank beyond 2030 whereby it would be prudent to also consider how those reserves of 5.81mt (for 2030-2037) can also be found. There are a number of site options (Site Options Evidence Paper) which are suggested through the consultation documents and which potentially could meet the requirements.
Strategic Policy Aim for Primary Aggregate Minerals-Meeting the need
Subject to economic, environmental and social considerations, provision for an adequate and steady supply of aggregates will be made to maintain a landbank of at least 10 years for crushed rock and 7 years for sand and gravel for the period to 2030. The required provision is based on the Local Aggregates Assessment (LAA) but this will be kept under review and will be subject to annual monitoring through the rolling LAA process. Where a shortfall in the landbank becomes apparent a review of the plan may be triggered.

Strategic Policy Aim for Primary Aggregate Minerals - identifying Future Supply Areas

1. For crushed rock appropriate areas in the Forest of Dean (FoD) and in the Cotswolds will be identified in the MLP based on a 70:30 division of the Local Aggregates Assessment requirement.

   The LAA identifies an annual crushed rock provision of 1.6mt which equates to 1.12mtpa from the FoD and 0.48mtpa from the Cotswolds based on a 70:30 proportional split in supplies. Subject to the consultation on site options and the eventual ‘testing’ of site allocations it is anticipated that the bulk of provision for crushed rock will be made in the finalised plan through preferred areas in the respective resource areas.

2. For sand and gravel the main focus for provision of the requirement identified within the Local Aggregates Assessment will be the Upper Thames Valley (UTV). Appropriate areas for this supply will be identified in the MLP which also acknowledges that some local supply may be required from the Severn Vale.

   The LAA identifies an annual sand and gravel provision of 0.83mt and that over the last 10 years approximately 95-98% of supplies have been provided from the UTV. As for crushed rock, it is anticipated that the finalised plan will contain preferred areas for the provision of sand and gravel. These will be generally based within the UTV. Provision outside the UTV will be made through allocations only where these have been tested and found to be environmentally acceptable and/or through criteria based policy.
Draft Policy Preferred Areas for Aggregates

Proposals for the extraction and/or processing of crushed rock and sand and gravel within the Preferred Areas identified in the MLP will be permitted where:

i. The mineral is required to maintain the landbank requirements throughout the plan period

ii. The key development criteria of the plan are satisfied (to be agreed after the consideration of which allocations are taken forward following the sites options and draft policy framework consultation).

The Preferred Areas are;

i. **Forest of Dean (Crushed Rock)**- (preferred areas to be inserted after consideration of the consultation on site options and indicated through the preparation of the pre publication Draft MLP)

ii. **Cotswolds (Crushed Rock)**- (preferred areas to be inserted after consideration of the consultation on site options and indicated through the preparation of the pre publication Draft MLP)

iii. **Sand and Gravel** (preferred areas to be inserted after consideration of the consultation on site options and indicated through the preparation of the pre publication Draft MLP)

2.4.18 Although it is anticipated that the majority of provision is made through Preferred Areas /Site Allocations, there is also a need to provide a draft policy framework for dealing with proposals for the working of aggregates which might come forward outside Preferred Areas. It is important to have this in place because without prejudice to the identified site options, no decisions have been taken as yet so it remains to be seen as to whether sufficient provision can be made in the final adopted plan. This will not be known until the consultation responses process on the site options has been completed and considered and recommendations taken forward for the purposes of pre-publication and publication of the Plan. The Plan and any site allocations would then be considered through the examination of the submitted plan and proposals.

2.4.19 Assuming the final adopted plan identifies sufficient allocations to meet in theory the anticipated provision there may still be circumstances whereby planning applications for the winning and working of aggregates might come forward outside allocated sites in the same way this has occurred since the adoption of the MLP in 2003. Since then a number of permissions have been granted for working outside Preferred Areas; these were considered against Policy A4 of the MLP.
2.4.20 Therefore taking both these circumstances into consideration means that a draft policy framework for such circumstances needs to be considered for inclusion in the new MLP.

2.4.21 With regard to Policy A4 of the adopted MLP, whilst this has provided a framework for the consideration of proposals outside allocated areas the criteria of the policy require re-assessment to ensure compliance with the NPPF and that it is up to date. When MPS1 (MPS1 Practice Guidance) was published after the adoption of the MLP it arguably made the policy over restrictive. However, reading the policy alongside MPS1 has ensured consistency with policy in the determination of planning applications.

2.4.22 Although MPS1 has since been replaced by the NPPF of 2012, the Practice Guidance is still in place, at the time of writing. However, DCLG are consulting on replacement guidance. At the moment, therefore, the following policy approach is drafted but this may require adjustment when final guidance is produced.

2.4.23 In particular it is important that any such proposals coming forward outside allocated sites can provide for landbank shortfalls as well as meeting the development control/management criteria for the Plan. Otherwise there are two likely circumstances whereby sites might come forward.

2.4.24 The first of these could be where a developer can clearly justify that the site is more suitable than a site that is allocated in the plan. In theory the Plan’s preparation makes this unlikely but there are chances that circumstances will change over time. The other circumstance is where a relatively small operation is proposed and the Council is aware that there could be debate over the definition of this. However, recent examples have included sand and gravel sites with reserves of up to 750,000 tonnes (Dryleaze Farm) and for crushed rock there has been an application for the deepening of an existing quarry which was not in a Preferred Area to release c.2mt of reserves (Huntsmans Quarry). These examples demonstrate that it is difficult to place a quantity on this in some circumstances. In any event the criteria and policies in the rest of the Plan would still need to be satisfied.
Draft Policy Proposals for the working of aggregates outside of Preferred Areas

Proposals for the extraction or processing of crushed rock or sand and gravel aggregates outside the identified Preferred Areas will be permitted where:

- It can be demonstrated that the contribution will address a shortfall in the relevant landbank; or
- It can be demonstrated that the need for the mineral cannot be met from another more sustainable source and that the proposed operations will result in an overriding environmental or community benefits in Gloucestershire; or
- the proposal is only of a small scale or is to enable the maximum recovery of any residual resource adjacent to an existing quarry.

2.5 ALTERNATIVE AGGREGATES

2.5.1 This subsection is concerned with secondary and recycled aggregates and the potential of these ‘alternative aggregates’ to supplement supplies of primary (quarried) aggregates in the county. More information on alternative aggregates can also be found in the Second Gloucestershire Local Aggregates Assessment and the LAA Baseline Report (November 2013).

Local Policy

2.5.2 Until recently, the local policy of relevance to the future provision of recycled and secondary aggregates was to be found in Policy M.2 of the Adopted Gloucestershire Structure Plan 2nd Review and Policies SE1 and SE2 of the Adopted Mineral Local Plan (MLP) 2003. These policies had reflected the gradual change that was then emerging, and which has since intensified, regarding a more sustainable supply approach to aggregates in order to place less reliance on traditional land won sources and encouraged greater use of secondary and recycled aggregates.

2.5.3 Currently, there are no strategic planning policies that deal with the issue of alternative aggregates because these have either been revoked by the Secretary of State (see Section 1), or policies in the MLP were not ‘saved’ under transitional arrangements. At best the ‘unsaved’ policies, Policies SE1 and SE2 of the adopted MLP, are considerations of limited weight in the absence of any other plan.
2.5.4 However, in November 2012 the County Council adopted a Waste Core Strategy (WCS) that specifically considers waste management facilities in Gloucestershire. Therefore the emerging MLP should be consistent with the spatial approach and policies in this most recent plan. Strategic Objective 2 of the WCS is aimed at re-using, recycling and composting waste and identifies that there is a need to divert around 85,000 tonnes of C&D waste per year from landfill which will be achieved through inert waste recycling and recovery. Core Policy WCS4 - Inert Waste Recycling and Recovery is shown below. It provides for the proposed annual diversion and, subject to criteria, the development of waste recycling and recovery sites.

Core Policy WCS4-Inert Waste Recycling and Recovery

In order to help reduce the impact of landfill and achieve the requirements of the Waste Framework Directive (2008) the Council will aim to divert around 85,000 tonnes/year of inert waste from landfill through recycling and recovery operations.

Proposals for inert waste recycling and recovery facilities will be permitted where it can be demonstrated that:
1. The impact on the environment and neighbouring land uses is acceptable including detailed assessment of the impact of noise and dust and attenuation measures.
2. Where viable, the proposal incorporates the use of alternatives to road transport such as rail and water and that where road transport is used the highway access is suitable for the proposed vehicle movements and is supported by a transport assessment and travel plan setting out measures to encourage employees to reach the site by foot, cycle or public transport.
3. The proposal contributes towards providing a sustainable waste management system for Gloucestershire
4. If the proposal is permanent and of a 'strategic scale' (>50,000 tonnes/year) it is located in the area defined as ‘Zone C’ (see Key Diagram) except where located within an existing or disused mineral working.

Developments may be acceptable on existing waste management sites and mineral workings where it can be demonstrated that the minimum amount of materials are being used for restoration/engineering purposes and that the use will not unduly prejudice the agreed restoration principles and timescale for the site. Temporary developments may be acceptable where the material is recycled and re-used on site.

2.5.5 Zone C is identified in the WCS as occupying the corridor of land that follows the M5 through the county, taking in the urban areas of Gloucester and Cheltenham and lying between the Cotswolds AONB in
the east and the flood plain of the River Severn to the west. It is essentially near to the main concentration of population in the county and generally to the main source of waste arisings.

2.5.6 The adopted Waste Core Strategy also safeguards existing and allocated sites from development that would be incompatible with the use of the sites for waste management. These sites include sites used for the recycling of C&D wastes.

### Core Policy WCS-11 Safeguarding Sites for Waste Management

Existing and allocate sites* for waste management use will normally be safeguarded by local planning authorities who must consult the Waste Planning Authority where there is likely to be incompatibility between land uses. Proposals that would adversely affect, or be adversely affected by, waste management uses will not be permitted unless it can be satisfactorily demonstrated by the applicant that there would be no conflict.

The Waste Planning Authority (WPA) will oppose proposals for development that would prejudice the use of the site for waste management.

*includes sewage treatment works

2.5.7 This MLP will take over from the earlier work by the County Council on replacement minerals policies that was initiated by work on a Minerals Core Strategy. Preferred Option MPO9 (below) had been drafted for the MCS and following a period of consultation of the responses the County Council had published a report on the results. This indicated a general consensus for the policy to be taken forward to form the then emerging policy approach for what was then the MCS, now the MLP.

### Policy MPO9

Preferred Option MPO9 looks to support a consistent and joined-up policy approach for the re-use and recycling of construction and demolition wastes within Gloucestershire. It seeks to achieve this by following the locational strategy of the County’s evolving Waste Core Strategy (WCS). However, in recognition of the potential opportunity to ‘add value’ at existing mineral sites, the preferred option also seeks to support ancillary recycling of materials where there is sufficient environmental capacity to do so and where the wider spatial objectives of the substantive minerals operation are not to be compromised.

2.5.8 However, the report also recognised a number of issues in taking this stance forward e.g. environmental acceptability of sites, the need to
avoid harm to biodiversity and geodiversity interests and the location of facilities within the FoD and Cotswolds. Concerns were also raised about potentially extending the duration of mineral workings and their subsequent restoration if recycling facilities are located within them; the limitations of recycled stone and the need for a % target for re-use and recycling to improve capacity for alternative mineral resources.

2.5.9 Comments were also made with respect to issues surrounding the strategic and general objectives for aggregates which had then been based on meeting the higher 2001-2016 national and regional guidelines (Preferred Option MPO2) and promotion of the maximum reuse and recycling of materials. A reassessment of Gloucestershire’s SRA was sought by some respondents as was the adoption of a ‘low as reasonably practicable’ approach to making provision.

2.5.10 Preferred Option MPO2 also promoted the maximum reuse and recycling of materials in preference to primary minerals, particularly where transportation is kept to a minimum and the handling and processing of recyclates will not have an adverse impact on the environment or prejudice site restoration.

District Local Plans and Development Frameworks

2.5.11 The plans that are prepared by District Councils in Gloucestershire and which may contain proposals for development that might not be compatible with the operation of recycled aggregates sites may have an impact on the provision of recycling facilities in the county as the proposed land uses could compromise operations at existing recycling sites or prejudice future opportunities for their expansion. As referred to above the accompanying Safeguarding Evidence Paper puts forward a policy approach that is aimed at minimising any conflict.

The Alternative Aggregates Industry in Context

2.5.12 In planning terms alternative aggregates are comprised of secondary and recycled aggregates. Secondary aggregates are usually defined as (a) aggregates that are obtained as a by-product of other quarrying and mining operations or (b) aggregates obtained as a by-product of other industrial processes such as blast furnace slag or incinerator ash. In the South West the dominant example of (a) is the waste produced during the extraction and processing of china clay in Cornwall and Devon from which approximately 1.9mt of aggregate was derived in 201236.

2.5.13 However, in European specifications a somewhat simpler classification is used; mineral waste that is sold as aggregates is classified as natural aggregate and by-product aggregate derived from industrial processes is classified as manufactured aggregates. In the UK the definition of secondary aggregates in (a) above is generally used for recording the production of these alternatives to primary quarried aggregates though

there are some local exceptions. With the passage of time and changing practice and intentions in industry the distinction between secondary and primary aggregates is becoming blurred at some sites as the level of production of the secondary aggregates at ostensibly non aggregate sites may be as great as or even exceed the production of the non aggregate mineral.

2.5.14 In Gloucestershire aggregates that are produced by crushing quarried or processed waste limestone or sandstone at building stone quarries, where the primary product is the building stone, is recorded as primary aggregate whereas colliery spoil that was produced by coal mining in the Forest of Dean but which is not currently worked for aggregate purposes would be recorded as a secondary aggregate.

2.5.15 The situation regarding recycled aggregates is clearer as these are produced from wastes arising from construction, demolition and excavation works (C,D&E wastes); these aggregates commonly include recycled concrete, bricks and road planings.

2.5.16 At some sites it would be possible for the mineral that was initially extracted to become a subordinate target if the site were to become more commercially attractive for the production of aggregates.

2.5.17 In the South West, secondary aggregates are only of significance in Cornwall and Devon where the use of china clay waste dominates this particular supply sector with slate waste and ball clay sands also making a small but valuable contribution to supplies. In Cornwall sales of china clay aggregates amount to about 50% of aggregates sales. Elsewhere in the region sales of other secondary aggregates are relatively small. Sales of secondary aggregates in the South West are estimated to have been about 8% of total aggregate sales of c. 25.45mt\(^3\) (primary land won and marine dredged aggregate, recycled aggregates and secondary aggregates).

2.5.18 Nationally, the main source of alternative aggregates is the material that is recycled from construction, demolition and excavation wastes. Recycled aggregates are a very important supplementary source of aggregates for the construction market and since 2002 with the introduction of the Aggregates Levy sales have gradually risen. In Great Britain in 2005, recycled aggregates made up an estimated 21% of supply; by comparison secondary aggregates made up only c. 3%\(^3\). However, industry commentators consider that production of recycled aggregates, which now accounts for c. 25% of supply, has probably peaked.

\(^{37}\) Based on sales data in the SWAWP Annual Report 2012.
\(^{38}\) BGS Mineral Planning Factsheet Construction Aggregates.
2.5.19 In recent years the Mineral Products Association has helpfully contributed to the investigations into the production of recycled aggregates and the association’s estimates for 2010 have been included in the government’s publication on C&D recycling\textsuperscript{39}. The MPA estimated that in 2010 approximately 34.8mt of recycled aggregates were produced by the C&D sector. This estimate was based on 2009 data which was accepted as having changed very little by 2010.

2.5.20 Survey results shown in the South West Aggregates Working Party Annual Report 2012 indicate that production of recycled aggregates in the South West were in the order of c. 2.41mt though this figure is based on surveys that were not all carried out for the same year and which included some estimates by MPAs. If this amount is reliably indicative of the 2012 situation then it is equivalent to about 9.5% of total aggregate sales, considerably lower than the national situation but one that, notwithstanding the fiscal disadvantages faced by the primary aggregates industry, probably reflects the ready availability of primary aggregates in the region and the demand for the higher specification aggregates that the recycled aggregates industry generally cannot produce.

2.5.21 The survey results for the South West are to be taken only as a general indication of the contribution that sales of recycled and secondary aggregates make to the construction market. Capturing data on sales of recycled aggregates in particular is notoriously difficult compared to the far more reliable and accurate data that is supplied by the primary aggregates industry; this was acknowledged in the Council’s earlier work in producing the secondary and recycled aggregates report (MCS-D) for the Minerals Core Strategy.

2.5.22 The survey that was carried out by the County Council for 2012 resulted in a patchy response from the operators of fixed recycling sites but from this it was estimated that about100,000 tonnes of recycled aggregates had been produced. This amount would have been lower than the total arisings of C, D & E wastes in the county, which would have included materials not suitable for use as aggregates, and the amounts that were actually managed at fixed sites. Moreover this survey does not include any sales from mobile recycling plant working at development sites and also did not captured any actual use of C,D & E wastes on those sites, the use of which would have helped reduce the use of imported primary aggregates for on site construction. Developers today endeavour to minimise the amount of ‘waste’ that has to be taken off site for disposal because of costs so there tends to be greater use of processed or unprocessed wastes on site.

\textsuperscript{39} Construction, Demolition and Excavation waste generation estimate: England2008-2009. DEFRA
2.5.23 The survey for Gloucestershire also showed that no secondary aggregates (type a) had been produced in 2012. It is also believed that no type (b) secondary aggregates were produced during the year.

2.5.24 All alternative aggregates that were produced in the county were transported by HGV and with respect to recycled aggregates it is likely that most of the waste that was initially sourced for recycling from construction and demolition sites arose in Gloucestershire, because of the short haulage distances that are common to most low priced aggregates, and that most of the recycled products were also used within the county. This is not an unreasonable assumption to make but it is recognised as being a generalisation as the economics of the time will have determined the commercial viability of longer distance haulage from source to recycling site and thence to market destinations for the aggregates. Market destinations for secondary aggregates produced at quarries in the county were likely to have been similarly local.

2.5.25 In addition to the 2012 survey returns from recycled aggregates producers, Gloucestershire County Council recovered approximately 48,000 tonnes of road planings to sites for recycling in the year. Although some of this material may have gone to recycling sites within the county it is difficult to assess whether or not this should be considered as being additional sales to the 100,000 tonnes of recorded sales from fixed recycling.

2.5.26 The County Council survey of C&D recycling sites for 2012 had identified 18 permanent inert recycling and recovery facilities in the county, the majority of which are located in urban areas (Gloucestershire and Cheltenham) and along the M5 corridor. Figure 6.1 in the second LAA shows their locations and Table 6.1 details of the operators concerned.

**Key Issues facing Gloucestershire**

2.5.27 There are challenges faced in providing appropriate facilities and capacity for the production of alternative aggregates during the period of the MLP. These were largely recognised in the earlier work on the MCS.

**Acquisition of Data**

2.5.28 The key issue, and one which is a national problem, in assessing the contribution made by recycled aggregates to the consumption of aggregates in the County and elsewhere remains the capture of reliable, consistent and accurate data on production and markets. For secondary aggregates the problem is not nearly so great. Improved data capture may be possible but it will require greater co-operation from the recycling industry in the same way that the government and the MPAs have established a good relationship with the primary aggregates industry which, for many years, has resulted in quarry companies providing details of their annual production and permitted reserves of primary
aggregates. Information on recycled aggregates production at those quarries that produce them has also been provided as a spin off of the main aggregates survey but the response from recycling companies that operate elsewhere in the county has been patchy.

2.5.29 In addition to the annual surveys a four yearly national survey of the aggregates industry yields information on market destinations and the amount of primary aggregates sent to them.

2.5.30 Most quarry companies have accepted the value of supplying data to the County Council and to the South West Aggregates Working Party for forward planning purposes. The data is supplied in confidence on a voluntary basis every year and every four years, as part of the national survey, and is collated in such a way that individual company data cannot be gleaned from published results. In practice a similar approach to obtaining raw data is likely to be realistically possible only in the case of fixed recycling sites as the transitory mobile processing plant that is associated with on-site processing of wastes at demolition and construction sites will always be a difficult target to survey.

2.5.31 What data does already exist, however, is that which is captured by the Environment Agency as part of the site permitting regime or from outdated commissioned national surveys on waste arisings but unfortunately this data does not readily reveal the amount that has been recycled for use as aggregate. The management of wastes often involves separate handling and transfer operations which, along with the potential for the application of different interpretation of waste categories by industry combine to increase the likelihood of double counting and mistakes in the collated figures; the use of proxies and assumptions in assessing waste arisings introduces a further element of uncertainty about published figures. Indeed, overarching estimates and high level extrapolations from pre-existing data are considered by government to be unlikely to satisfy the reporting requirements of the revised EU Waste Framework Directive to demonstrate progress towards meeting recycling targets for C&D waste.

A Spatial Strategy

2.5.32 The WCS (Core Policy WCS4) sets out considerations relating to the future location of all recycled aggregates facilities but provides a positive steer towards the location of new permanent ‘strategic scale’ facilities in Zone C (the central corridor in Gloucestershire which embraces the main urban areas). Together with Preferred Option MP09 of the MCS there is qualified encouragement for the location of other fixed and temporary facilities to be associated with mineral workings. This combination of an adopted and an intended policy approach and the existing network of

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40 Figure 5 in the WCS (page 57)
permanent sites provides a ‘spatial strategy’ that could result in enough fixed facilities to provide adequate capacity for recycled aggregates to make a worthwhile contribution to supplies of construction aggregates.

2.5.33 In 2010 it was estimated that the waste management capacity at C&D sites in the County was approximately 504,000tpa\(^4\). If it is assumed that 50\% could be recycled into aggregates this would give an aggregates capacity of about 250,000tpa.

2.5.34 Existing and any new facilities located in Zone C will be able to access suitable wastes from the principal but proximate urban areas in the County with minimum transport costs and impact on the highways of Gloucestershire and if wastes are imported from elsewhere could make use of the M5 with similar advantages to local amenity.

2.5.35 Although mineral workings might not all have good access to the highway network and may also be some distance from urban areas, if HGV loads of wastes for recycling are handled on a return load basis by quarry lorries otherwise returning to a quarry empty after delivering primary aggregates or if the sale of recycled aggregates replaces those of primary aggregates there should be little change in the impact of HGV’s on the network.

2.5.36 Again subject to caveats, recycled aggregates sites may also be possible at other waste management sites as referred to in WCS-4 or as standalone operations elsewhere. Depending on circumstances these could be permanent or temporary facilities.

2.5.37 The spatial strategy of the MLP cannot cater for the temporary mobile operations that occasionally spring up in connection with works at demolition sites. In effect these are windfall sites that will have the benefit of providing some grades of aggregate on site thereby reducing the volume of imported primary or alternative aggregates needed for the development.

Support for use of Secondary and Recycled aggregates from other areas

2.5.38 In Gloucestershire the production of secondary aggregates has generally been associated with the limited recovery of shale and harder rocks from colliery spoil tips but it also occurs at building stone quarries where ‘waste’ rock may be used as an aggregate with or without crushing. As mentioned above, however, for reporting purposes the latter production is regarded as a primary aggregate by most minerals operators and the County Council. These activities have the advantage of extending the end use applications of finite mineral resources, maximising the value and life of the mineral deposit and potentially reducing mineral dereliction that might have been caused by the formation of mineral waste tips.

2.5.39 These advantages are tempered to some degree by the effect it can have on reducing on site waste mineral for use in reclaiming the site. The reclamation problems that might be caused by this in the county are, however, offset to some degree by the greater availability of aggregates for construction and the more efficient husbanding of permitted reserves. Depending on circumstances and the nature of quarry wastes the more recent planning permissions that have been issued by the County Council tend to require the retention of some waste on site to aid reclamation, but older planning permissions may not be controlled in the same way.

2.5.40 The production of recycled aggregates from C&D wastes generally also has the effect of extending the life of primary aggregate resources and if these operations are carried out at quarries may alone diversify the quarry’s products and by blending with excavated and processed quarry waste it may also extend the life of the unit. Residual wastes can then be used for on-site reclamation. However, by extending the duration of operations at a quarry this will increase its overall life and impact on reclamation timetables, possibly to the detriment of the local community and the speedy reclamation of the site; it is therefore important that this should not occur and that the cessation of recycling operations should normally be co-terminous with the exhaustion of the primary aggregate reserves.

2.5.41 This approach could, however, be to the long term detriment of supplies unless sufficient infrastructure remains at non-quarry locations. Thus there may be a case in appropriate locations for the retention of recycling activities at exhausted mineral workings.

2.5.42 There is considerable support in national policy for the greater use of alternative aggregates and the County Council acknowledges that this has an important part to play in the supply chain for aggregates from Gloucestershire, whether this is the use of locally derived C&D wastes or secondary aggregates or materials. But this is subject to other considerations such as the environmental effects locally of haulage and processing.

2.5.43 Imports of C&D wastes from adjoining MPA areas are known to occur because of proximity but other than the use of secondary aggregates that might be imported in limited amounts for a higher specification end use, such as blast furnace slag for road surfacing, it is believed that in Gloucestershire secondary aggregates do not currently make as much a contribution to supplies as do recycled C&D wastes.

2.5.44 The main source of secondary aggregates in the South West is the china clay wastes in Cornwall and Devon, small amounts of which are exported to more distant locations such as the south east of England where there is a general dearth of local aggregate supplies. In the south west their
use is mainly confined to their home counties due to the ready availability of primary aggregates in the region and the high cost of transporting them. Nevertheless, proposals for the regular importation of these particular wastes could come forward in later years or, and perhaps more likely, before then for one off projects if commercially viable. This is might use existing infrastructure for transport and distribution or could require additional facilities in the county.

2.5.45 Major developments elsewhere in the region could act as a catalyst for greater use of china clay wastes for construction purposes locally. For instance, at one time the use of this waste was considered for the Severn Barrage.

*Safeguarding Alternative Aggregates Infrastructure*

2.5.46 The existing fixed sites for the production of recycled aggregates already makes a valuable contribution to supplies of aggregates, believed to be predominantly for use in the county. Most of the sites are not associated with a mineral working and are exclusive waste operations.

2.5.47 These sites and any other that might be proposed as the MLP progresses are to be safeguarded (see the *Minerals Safeguarding Evidence Paper Policy B*) from the encroachment of development that would be incompatible with recycling operations and which could, by their presence, result in the cessation of recycling activities or a reduction in their productive capacity. Policy WCS-11 in the adopted Waste Core Strategy also safeguards sites but as this was prepared as part of the County Council’s waste planning function a similar policy is considered to be necessary for the MLP.

2.5.48 As was recognised in the MCS42, most of the County’s fixed sites that are not associated with mineral workings also tend to have a ‘low value’ land use that may be vulnerable to re development if a site operator is willing to dispose of their interest in the site, especially in the urban areas of the County. This could also result in a decline in the number of recycling facilities if sites are not safeguarded.

2.5.49 The duration of operations on the sites that are associated with mineral workings may be limited to the life of the quarry and other fixed sites elsewhere may also be time limited. All current sites are identified within Table 6.1 (of the second LAA) will be subject to safeguarding particularly through both the emerging MLP Policy (Safeguarding Policy B) and through adopted Core Policy WCS11.

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Secondary Aggregates from potential from industrial processes

2.5.50 In 2012 a planning application was made for an Energy from Waste (EfW) facility (incinerator) at Javelin Park in Zone C to the south of Gloucester. This has a throughput of 190,000tpa of Municipal Solid Waste (MSW) and Commercial and Industrial (C&I) waste. The application also included an on-site facility to produce c. 45,000tpa of secondary aggregate from the incinerator bottom ash. However, the application was refused by the WPA and is currently being considered through a Public Inquiry as a recovered appeal by the Secretary of State.

Policy Framework for Alternative Aggregates in Gloucestershire

2.5.51 Through the MLP the County Council is able to propose the following strategic aim to encourage greater production of recycled and secondary aggregates and the development of a spatial strategy.

<table>
<thead>
<tr>
<th>Strategic Aim</th>
</tr>
</thead>
<tbody>
<tr>
<td>Subject to the development management policies and criteria of the MLP, and Core Policy WCS4 of the adopted Waste Core Strategy, the County Council will support the development of secondary and fixed recycled aggregates facilities in Gloucestershire in order to provide a network of sites to augment the supply of primary aggregates extracted in the county. This will include the safeguarding of existing sites under Core Policy WCS11 and the proposed Safeguarding Policy for Minerals Infrastructure.</td>
</tr>
</tbody>
</table>

2.5.52 It is not proposed to include as specific policy for alternative aggregates as the subject is extensively covered through other adopted and proposed policy options including the adopted WCS policies WCS4 and WCS11 combined with the proposed mineral safeguarding, restoration and development management policies discussed through the MLP Options consultation.
3.0 Building and Roofing stone

3.1 Introduction & Local Policy Context

3.1.1 Natural building and roofing stone plays a major role in the UK economy by enhancing our living and working environments. It is also a vital part of our cultural heritage, which itself is a major asset for expanding leisure and tourism industries.

3.1.2 Natural stone has been used in building work across the UK for more than a millennium. Its geological diversity across the country has resulted in a varied use of different stones, which is probably unrivalled anywhere else in the world. The products include architectural masonry (dimension stone); natural stone ‘slates’ for roofing; sawn paving; natural paving; rough walling stone and crazy paving; kerbs and setts and monumental stone.

3.1.3 However, since the late 19th century natural stone production has been declined. This is largely due to changes in architectural styles, the availability of cheaper alternative building materials such as brick, steel or concrete, and the importation of less expensive stone from Europe and elsewhere in the world (e.g. South America and South-East Asia).

3.1.4 Nevertheless, natural building and roofing stone has remained important to the building industry, particularly in respect of building conservation and high-grade architectural projects.

3.1.5 Without access to the “right” natural stone, the built environment will become devalued. Historic buildings and monuments would either fall into disrepair, or be inappropriately restored. For new buildings, local vernacular styles and distinctive local characters may become degraded. Whilst traditional building techniques and skills such as stonemasonry would be lost over time and consigned to historic technical manuals. These concerns are recognised in the concept of ‘heritage’ quarries.

3.1.6 However, the working of natural stone, albeit often on an intermittent and small ‘cottage industry’ scale, but occasionally with periods of more intensive working, due to the specialised product, is an activity which, as with other types of mineral extraction, can result in adverse impacts on the environment and local amenity. Many of the country’s remaining natural stone resources lie within designated rural landscapes, which also need to be protected and where possible enhanced.

3.1.7 In addition, whilst relatively new quarries may be subject to modern operating conditions, many of the historic building stone quarries were granted planning permissions in areas that have since become designated rural areas and were permitted at a time when the highway access was considered to be acceptable. The review of planning
permissions and their conditions to bring quarries up to modern operating standards cannot alter the size of the permissions or the depth of mineral extraction, nor can it close a quarry because of poor access. Natural stone quarries can therefore sometimes pose a number of difficult planning challenges in seeking to provide for the stone necessary for new building and also for the sympathetic restoration and maintenance of existing structures.

3.1.8 It is also the case that many building and roofing stone sites that supplied local building work (both quarries and mines) predate planning controls and have long since been abandoned. Some have since been developed for other purposes but many have become overgrown and naturally colonised with little obvious sign of their previous use.

3.1.9 Consequently, a sound policy framework is needed to ensure the appropriate supply of natural building and roofing stone alongside the protection and enhancement of our valuable landscapes, natural environments and local amenities.

Local Policy

3.1.10 Local level policies for natural building and roofing stone in Gloucestershire are currently found in the Minerals Local Plan (1997-2006) which was adopted 2003. Chapter 4 and Policy NE1 of the Gloucestershire Minerals Local Plan sets out the approved local policy for the supply of building stone in the county. Policy NE1 states that:

“Proposals for sandstone and limestone working for natural building stone by extensions to existing workings, at new “greenfield” sites, or at sites where no valid planning permission exists, will only be permitted where:

i. It can be demonstrated that the needs for the local stone cannot be met adequately from existing reserves and that the proposals are for predominately the production of natural building stone purposes; and

ii. the need for the stone together with other planning benefits outweighs any adverse environmental, local amenity and other impacts of its winning and working; and

iii. any crushing or screening of stone or overburden is confined to that removed in order to work the natural building materials and which cannot be used in the landscaping or reclamation of the site; and

iv. they are in accordance with all other policies of this plan, in particular those relating to the Environment, Reclamation and Development Control.”

43 Environment Act 1995
3.1.11 The Issues and Options Report that was produced for consultation in 2006 as part of the initial work on a Minerals Core Strategy, which is now to be replaced by this Local Plan, offered stakeholders their first opportunity to comment on the future of natural building and roofing stone in Gloucestershire. During the consultation and public minerals forums\(^44\), three headline issues were raised –

- Local stone being used to the benefit of the local built environment;
- Designated landscapes such as AONBs need to be protected from the impacts of quarrying; and
- Transporting local stone needs to be carefully managed to make sure impacts on local amenity and the rural highway network are minimised.

3.1.12 Subsequently three preferred options were developed by the MPA for consultation as Preferred Options in 2008. These were;

**MPO7a**
Looks to apply the existing building stone policy used in the adopted MLP - Policy NE1. This policy provides a clear decision making framework including four criteria for new building stone proposals-

- A demonstration of ‘need’ for the stone
- The consideration of restoration benefits, heritage and the local economy
- An evaluation of crushing and screening of stone linked to aggregate production; and
- A review of other generic issues including local amenity, the environment and transportation

**MPO7b**
Proposes to expand upon the existing building stone policy used in the adopted MLP. It seeks to introduce the concept of ‘local distinctiveness’ and to develop a more ‘spatial’ approach to the management of the county’s building stone resources. It sets out four additional elements;

- A direct reference to the county’s key natural building and roofing stone resource areas
- A link between the MCS’s mineral safeguarding policy and delineated minerals safeguarding areas (MSAs) for natural building and roofing stone
- Specific criteria for hybrid- building stone quarries; and
- A link between rural economy strategies and relevant District Local Development Framework (LDFs) in the context of local employment opportunities

\(^44\) In July 2006, GCC undertook two public minerals forums to introduce headline issues and options for the emerging MCS. Information on the forum outcomes can be viewed on the GCC website via - [http://www.gloucestershire.gov.uk/index.cfm?articleid=13348](http://www.gloucestershire.gov.uk/index.cfm?articleid=13348)
MPO7c

Proposes the same resource safeguarding approach as highlighted in option MPO7b. However, it also looks to allocate specific sites for the future working of natural building and roofing stone.

This option would provide a greater degree of certainty in terms of securing future provision. However, due to the complexity of resources in the county, preferred areas will only be considered where a sufficient evidence base has been made available. This would include the geological reliability of resources and a clear demonstration of the ‘need’ for the stone; or particular stone products at a local, regional and / or national level. Information to this effect should be forthcoming from interested stakeholders, such as prospective quarry operators alongside English Heritage and local building conservation officers in respect of the ‘need’ issue.

3.1.13 Option MPO7b received the most positive support from respondents to the consultation on these options which was seen as the overall preferred option. Whilst this option was supported because of its ‘local distinctiveness’ in recognising the unique character of the different building stones in the county and safeguarding building stone resources, concerns were raised about the practicality of delineating suitable MSAs.

3.1.14 The MPA concluded that Option MPO7b should form the basis for the emerging policy in the MCS.

3.2 Natural Building and Roofing Stone in Gloucestershire

3.2.1 The working of natural building and roofing stone is an important part of the mineral industry in Gloucestershire. It is required for the on-going repair and maintenance of the county’s rich and diverse historic built environment and for supplying new-build and specialist, high-grade architectural projects.

Natural Building and Roofing Stone Resources

3.2.2 Gloucestershire’s natural building and roofing stone resources may be divided into two main mineral types: Limestone and Sandstone. These sedimentary rocks are separated over geological time and resource locations across the county. The following paragraphs provide a brief overview of the different stone resources starting with the oldest and ending with the youngest over geological time; more details on the mineral resources of the county are also to be found in the evidence report relating to Mineral Safeguarding Areas.

3.2.3 The oldest natural building and roofing stone currently worked in Gloucestershire is derived from Palaeozoic sandstones of the Devonian
“Brownstone Formation”. These were deposited between 400 and 360 million years ago and have a characteristic deep purple / red and green colour. The resource is present within the Forest of Dean on the edge of the coalfield and outcrops between Mitcheldean in the north and Lydney to the south. The Brownstones have recently been worked at Wilderness Quarry near Mitcheldean and thinner beds are worked at Copes Quarry near Blakeney for roofing slates.

3.2.4 Another Devonian rock that is particularly resistant to erosion and which has been widely used is the very coarse grained sandstone and conglomerates of the “Quartz Conglomerate Formation”. The latter is noted for its mix of substantial pebbles of quartz and igneous (volcanic) rock. Although examples of this stone can be seen in local buildings and also as quern stones and as apple cider presses it has not been worked for some time.

3.2.5 The county’s most significant building and roofing stone from within the Forest of Dean area comes, however, from a series of younger, Carboniferous sandstones known as the “Pennant Formation”. These sandstones were deposited around 360 to 280 million years and are known locally as Forest of Dean Blue or Forest of Dean Grey when referred to as a building stone due to subtle differences in their colour. The sandstones are commonly characterised by the presence of haematite or iron ore which creates a very distinctive red veining effect through the stone.

3.2.6 The Pennant Sandstone makes up the greater part of the Coal Measures in the Forest of Dean and the sequence has some notable coal seams. Extensively worked, especially where the beds have a low angle of dip, it is used locally and further afield as a building and engineering stone for use in heavy construction projects (railway bridges/docks etc;).

3.2.7 The younger Carboniferous limestone, also sourced from the Forest of Dean but from much larger quarries, is a further local source of a natural building stone. However, the vast majority of this particular mineral is crushed for use as an aggregate by the construction industry. More details about this can be found in the County Council’s Local Aggregates Assessment and in the Section 2 of this paper which are concerned with the provision of crushed rock aggregate.

3.2.8 To the east of the Forest of Dean the county is dominated by much younger, gently inclined rocks of Mesozoic age. In the far north-west of Gloucestershire are the sandstones of the “Bridgnorth and Bromsgrove Formations”. These were deposited between 280 and 200 million years ago during the Permian and Triassic periods. The relatively soft Bridgnorth sandstone is poorly cemented and although it has been used as a building stone its main use is as an aggregate (sand) after crushing; it is quarried at Bromsberrow. More information on this particular
resource can also be found in Section 2 of this paper which deals with sand and gravel.

3.2.9 The Bromsgrove Sandstone, though no longer quarried, has been widely used as a building stone and is a mixture of pebbly sandstones, similar to the Devonian Quartz Conglomerate of the Forest of Dean, siltstones and mudstones. There are numerous examples of this stone being used in local buildings.

3.2.10 In the Severn Vale grey and cream thinly bedded White Lias limestones that mark the transition between the Triassic and Jurassic periods and similar limestones and iron rich marlstones of the overlying Lower Jurassic (Blue Lias) have been quarried. However, the Jurassic rocks that have been and are most widely worked are the limestones of the Inferior and Great Oolite Groups that cap the Cotswold Hills above Cheltenham. This upland area is the source of some of the most important natural building and roofing stone in Gloucestershire.

3.2.11 These limestones, which were deposited between 200 and 130 million years ago, are made up of spherical or sub-spherical calcareous rock particles (ooliths c.<1mm diameter) that were formed from the accretion of successive, concentric layers of calcium carbonate around a central organic (e.g. shell fragment) or inorganic (e.g. sand grain) ‘nucleus’ that was caused by the constant agitation of the ooliths in the shallow waters. The shape and size of the ooliths have made this type of limestone relatively easy to cut in any direction. They have also allowed for a smooth and precise finish, which is often termed as “freestone” by the traditional stone craftsmen. Some other limestones may be comprised of pisoliths—these are larger ooliths (3-6mm diameter) which because of their ‘pea’ size give rise to the locally named Pea Grit.

3.2.12 In addition, the differences in the type of shelly materials available and their subsequent deposition, has resulted in many subtle variations in the limestone across the resource. Variations can be seen in the texture, colour and quality of quarried stone, at different locations and even between different horizons within a single quarry site, with stone varieties often having a local name.

3.2.13 The limestones of the Inferior Oolite group are the oldest of the two groups and are between 200 and 150 million years old. The group is comprised of a varied sequence of mainly oolitic limestones that range in thickness from <20m in the east and south of the county to over 100m in the Cheltenham-Cleeve area. A number of distinctive rock types can be distinguished including a range of freestones.

3.2.14 The overlying Great Oolite, which may be up to 90m thick, has an even greater variety of rock formations and different stone types with individual formations that thicken, thin and die out laterally. It includes limestones,
clayey limestones and shelly oolitic limestones. The flaggy, sandy oolitic limestones that comprise the Stonesfield Slate Beds are up to 8m thick and are more prominent in the mid and north Cotswolds; these limestones are an important source of traditional roofing stone.

3.2.15 Appendix B of this report provides an example list of the different local stone types, particularly the Jurassic limestones that are derived from the Inferior and Great Oolite limestone groups in the county. This list is not exhaustive and may not include all the stone types that have been worked. It is also worth noting that many of the stone types represent ‘relic’ stones, which have not been supplied locally for some time, or are no longer available in the UK. Furthermore, the name given to each stone could be subject to local variation.

3.2.16 Although Gloucestershire contains a wide range of locally distinctive natural stone types their use is not confined to the administrative boundaries of the county. Consequently natural stone from quarries in Gloucestershire have been used for many building and conservation projects in the neighbouring areas of Wiltshire, Bath and North East Somerset and Oxfordshire and in projects much further afield. In its report ‘Strategic Stone Study A Building Stone Atlas of Gloucestershire’ (2011), English Heritage cites many historic examples of the widespread use of the county’s building stones in buildings and other structures in Gloucestershire and beyond.

3.2.17 Figure 3 highlights the distribution and extent of natural building stone resources in Gloucestershire.

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45 Farmington Natural Stone Ltd has supplied stone from its quarry in Gloucestershire for a housing scheme in Biddestone, Wiltshire and the large re-development of Sydney Wharf in Bath. [http://www.farmingtonnaturalstone.co.uk/projectofthemonth_march.html](http://www.farmingtonnaturalstone.co.uk/projectofthemonth_march.html) (as of May 2007)

Natural Stone Markets Ltd also exemplifies the supply of its stone to several Colleges of Oxford University and the refurbishment of the ‘Alms Houses’ in Corsham, Wiltshire. [http://www.cotswoldstone.co.uk/home.htm](http://www.cotswoldstone.co.uk/home.htm) (as of May 2007)
Natural Building and Roofing Stone Supplies

3.2.18 As at 31/12/2012, the supply of natural building and roofing stone from Gloucestershire was just less than 61,000 tonnes, of about which c.12,000 tonnes were sourced from sandstone quarries. The vast majority was sourced from the Jurassic limestone resource found in the Cotswolds. The remainder was supplied by the Devonian and Carboniferous sandstone and limestone quarries in the Forest of Dean. No building stone was supplied from the Permian and Triassic sandstones located in the northwest of the county.

46 Gloucestershire County Council Survey
3.2.19 Over the 10 year period from 2002 to 2012 inclusive, the supply of natural building and roofing stone from Gloucestershire has shown a fairly steady increase in output, although there have been some local variations. The more recent annual breakdown of natural building and roofing stone supplies between 2008 and 2012 inclusive can be found in Appendix C.

_Natural Building and Roofing Stone Reserves_

3.2.20 Due to the variability of the county’s building stone resources and the lack of continuity of some, particularly those found in the Cotswolds, and the tendency for mineral operators to extract different quarry products alongside building stone, it is difficult to provide an accurate indication of the permitted reserves that are present in the county. Overall reserves and reserves intended for a particular end use are prone to rise and fall according to geological circumstances and commercial considerations.

3.2.21 This is a key issue with the county’s Carboniferous and Jurassic limestone quarries which also supply crushed rock aggregate, mineral for industrial purposes and quantities of agricultural lime. Where reserve assessments are carried out at relevant quarries it can prove extremely difficult to distinguish between which part of the reserve will prove suitable as a building stone and will not be used for another quarried product.

3.2.22 Nevertheless, local operators are actively encouraged to provide annual estimates of their non-aggregate reserves. These estimates cover all

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**Figure 4: Natural building and roofing stone supplied from Gloucestershire during 2012 by key mineral type**

- Limestone 80%
- Sandstone 20%
natural building stone products, agricultural lime and mineral for industrial purposes, where it is also worked.

3.2.23 As at 31/12/2012, Gloucestershire’s reserves of rock to be used for non-aggregate purposes were estimated to be 8.2 million tonnes. This amount increased from earlier years due to an increase in the reserves of Carboniferous limestone to be used for industrial purposes. Previously just over half of the reserves were present at Jurassic limestone quarries in the Cotswolds with the remainder being comprised of sandstone and limestone reserves in the Forest of Dean.

3.2.24 Based on the current rate of supply as at 31/12/2012, the county’s non-aggregate reserves could provide for up to 35 years of non-aggregate supplies. However, this is a gross amount that does not take into account the complexity of the resources; the requirements for particular product and building stone types. This level of detail cannot currently be presented due to issues of confidentiality of individual company data.

3.2.25 As of 31/12/2012, 22 building and roofing stone sites were in production. Appendix C shows the number of sites that were in production since 2008 and their annual output to 2012.

3.2.26 As can be seen from Appendix C, the vast majority of the county’s natural building and roofing stone sites lie within the Cotswolds, and Figure 3 shows these to be concentrated to the east of Cheltenham and north of Northleach. However, there is also a strong concentration of operations within the Forest of Dean.

3.2.27 In addition to these sites there are many, known historic (relic) building stone quarries present in the county and probably many more that are not evident today. According to English Heritage, the known relic sites and the permitted sites number more than 250 sites. 48 Although some of these sites may be barely recognisable as a former quarry, some could still contain workable building stone that could be required at some point in the future for certain specialist building and conservation projects. However, the re-opening and working of these sites must be able to meet all modern operational standards and where none are in place will require new planning permissions; some of these quarries, which may have provided supplies of building stone in the past, are listed in Appendix D.

3.2.28 This list of known quarries is not exhaustive and will need to be revised over time as it is based initially upon survey work carried out by the County Council for the “Review of Old Mineral Permissions (ROMPs)” as

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47 Permitted reserves divided by the latest annual production level
required by the Environment Act 1995\textsuperscript{49}; which does not take account of quarries closed before the advent of the UK planning system in 1947, and more extensive work on quarries that has been undertaken by English Heritage as part of its Strategic Stone Study. Further liaison with English Heritage, District conservation officers and County Heritage Team is likely to throw up more historic building stone sites as records are reviewed, some of which, subject to the necessary permissions, could possibly be re-activated to provide a variety of building stone that has not been won for many years or further resources of a stone that is worked today.

3.2.29 The results of the Strategic Stone Study to date has revealed just how widespread the extraction of building stones has been in the county but also the popularity of particular stones. For instance, the study has shown that in excess of 80\% of the sites recorded by the Study had worked Jurassic limestones, mainly the Birdlip Limestone, Coppice Limestone, Forest Marble and White Limestone but that about 15\% of sites had worked Carboniferous rocks, mainly Pennant sandstones; Devonian, Triassic and other Jurassic limestone sites made up the remaining contributions.

\textit{Size and Scale of operations}

3.2.30 Most natural building and roofing stone operations in Gloucestershire are small-scale and focus on the supply of products for local building conservation and more bespoke new building projects. Many of the quarries are worked intermittently; this is due in part to the limited nature of the market for their particular quarried stone.

3.2.31 However, there are also some quarries, particularly within the Cotswolds area, which are more intensively worked. These are characterised by the working of aggregates in bulk volume as well as the usual lesser quantities of building stone and may be described as “hybrid building stone quarries”. This type of operation is attractive to the quarry owners as it provides more diverse and consistent revenue streams.

3.2.32 There are a number of issues surrounding this type of quarry operation which are not normally associated with small building stone quarries: -

- The rational and sustainable working of resources to their full potential;
- The increased potential for adverse amenity impacts due to crushing operations and increased scale of working (noise, dust, traffic etc.);
- The potential loss of valuable building stone to aggregate uses;
- The size and nature of operations with landscaping impacts; and

\textsuperscript{49} Through the Environment Act 2005, MPAs are required to periodically review and update old mineral permissions. As part of this process local surveys have been carried out in order to establish which sites would meet the various review criteria as set down by the Act. As a result a list of redundant / closed sites was formulated in Gloucestershire. All of these sites failed to meet the review criteria and as such would need completely new permissions before new working can take place.
• The loss of quarry ‘waste’ material for restoration.

3.2.33 The challenges and problems posed by hybrid working are possibly more acute in Gloucestershire than elsewhere because of the substantial extent of designated and protected landscapes over much of the key limestone resource (i.e. Cotswold AONB). In addition, highway safety and management issues resulting from a limited rural road network present a further compounding factor.

3.2.34 The small amount of building stone produced by crushed rock aggregate sites in the Forest of Dean represents only a small proportion of their total annual output.\(^{50}\)

*Techniques: Quarrying*

3.2.35 Unlike quarrying for the production of crushed rock aggregates, which normally involves the use of explosives, to reduce the size of the rock to small fragments at the quarry face followed by crushing and screening to produce a range of sized aggregates, the use of blasting is limited (if used at all) in the production of natural building and roofing stone. This is because the intention here is to recover large, ‘undamaged’ blocks of stone from the quarry face that can then be dressed to size. Where blasting does take place it is associated with the county’s limestone quarries that are primarily operated to produce crushed rock aggregate (i.e. Carboniferous Limestone in the Forest of Dean); any building stone produced by these quarries is regarded as a by-product of the operation.

3.2.36 Most of Gloucestershire’s natural building and roofing stone is therefore quarried by mechanical excavators, which are used to take careful advantage of the rocks’ natural discontinuities at the quarry face such as bedding planes and joints to prise blocks and smaller stone (e.g. rubble, slates) free. However, stone blocks may also be quarried or subsequently reduced in size by hand using picks, jacks, hammers and wedges.

*Processing*

3.2.37 There are many different ways of processing natural stone after it has been won at the quarry face. These directly relate to the quality of quarried materials and the intended end-uses.

3.2.38 In Gloucestershire several processing techniques are employed. The simplest of these is simple splitting and breaking to create rough walling stone and naturally “riven” paving. In the majority of cases this operation is carried out on-site either by hand or by using a mechanical stone guillotine. When larger blocks of stone (dimension stone) are needed to

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\(^{50}\) As at 31/12/2012 building stone derived from larger-scale crushed rock aggregate quarries accounted for approximately 8% of their total annual output. These crushed rock operations are referred to in more detail in Section 2 of this paper on crushed rock aggregates.
create masonry, cladding and some types of paving products more complex processing techniques are employed. In this case blocks are either cut or sawn down using heavy-duty frame saws and rotary blades before being handcrafted by stonemasons into complex or ornate designs.

3.2.39 Due to the investment needed for specialist equipment and the limited availability of stonemasonry skills, dimension stone cannot always be worked on-site. As a result it is often transported to stone yards in and near Gloucestershire for processing.\(^{51}\)

3.2.40 Some of the building stone resources in Gloucestershire are also worked to provide stone 'slates' for roofing. Three different methods of slate production have been practiced in the county. Their use is linked to the characteristics of the particular stone and the technical skills available.

3.2.41 The first method involves the laying out of quarried limestone for frost shattering between the winter months of November and January. This creates a very thin slate, which can be lightly worked by hand to create a roof stone e.g. “Stonesfield Slate”. The origins of this technique can be traced to the village of Stonesfield in West Oxfordshire. It is very much an historic process, which is heavily dependent upon local weather conditions.

3.2.42 The second method is by splitting the stone by hand shortly after it has been extracted from the ground. This is the oldest method of producing slates in the Cotswold area. Although it requires a degree of skill and timing to perfect it is still practiced at a small number of local quarries that work the “Forest Marble” limestone.

3.2.43 The third and final method of producing stone slates is by sawing stone to thickness using frame saws and rotary blades. This method is less precise than the “splitting” of more traditional methods and does not always provide for the variety of stone slates. As a result some concern has been expressed locally in applying mechanically cut stone slates to certain building and conservation projects.\(^{52}\)

Building Stone Markets in Gloucestershire

3.2.44 As referred to earlier, there are two principal markets for natural building and roofing stone i.e. repair of historic buildings and new build projects.

3.2.45 In Gloucestershire, the repair of historic buildings is a significant driver of local demand. The county has a renowned and rich built heritage of

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\(^{51}\) e.g. Forest Stone Firms in the Forest of Dean imports local stone from Barnhill / Bixhead Quarry (see diagram 1) to its stone works at Parkend near Lydney for processing into finished products and bespoke pieces of masonry. Cotswold Natural Stone Ltd exports stone from Oxleaze Quarry near Cheltenham to its stone yard based at Shilton near Burford in Oxfordshire.

\(^{52}\) Cotswold District Council and Tewkesbury Borough Council Technical Notes on Stone Slate Roofing, both advise that: - *Stone slates which have been sawn to thickness, rather than split, can be technically and aesthetically unacceptable and, if they fail to meet these criteria, should not be used on historic buildings.*
listed buildings and conservation areas\textsuperscript{53}. A significant number of buildings and structures covered by one of the listings or which lie within a conservation area will at some point require new stone for repair and maintenance purposes.

3.2.46 Despite the UK wide downturn in the production of building stone over the last 100 years or so, and notwithstanding the ‘blip’ caused by the current economic depression, the local market has remained relatively constant with an upsurge in demand being evident in recent times. This has been due in part to the heightened public interest in building conservation, greater access to financial assistance (particularly through the heritage lottery fund)\textsuperscript{54} and until 2008, a buoyant national economy. Planning policies and controls have also had an influence on the strength of this local market. This is demonstrated through district local plans and technical planning guides wherein policy support is given for the use of natural local stone where it will act as a direct or suitable replacement in the repair of the historic environment.

3.2.47 The other key market for local building stone is new build projects. This is concerned primarily with maintaining vernacular styles and local distinctiveness through the greater use of local building materials. It also refers to the specific requirements of certain contemporary styles in both external and internal decoration (e.g. carved fireplaces, statutes, ornaments and flagstones). Similar to the sector for historic stone, district planning policies look to encourage the use of local building stone where it contributes to the quality of the built environment. The ‘export’ market to provide stone for ‘prestigious’ building projects also contributes to this demand.

\textsuperscript{53} Conservation Areas are designated under the terms of the Planning (Listed Buildings and Conservation Areas) Act 1990. They are areas of special architectural or historic interest that through the planning process should be ‘preserved and enhanced’.

\textsuperscript{54} According to the Heritage Lottery Fund (LHF) over £3.6 billion has awarded to more than 22,500 building conservation projects across the UK since 1994.
3.3 Key Issues facing Natural Building and Roofing Stone in Gloucestershire

3.3.1 As referred to earlier there has been an increased interest in the use of natural building and roofing stone in recent years. This coincides with greater public awareness and interest in building conservation, more financial support for conservation practices and increased policy guidance and technical advice on using the ‘right’ materials in the built environment.

3.3.2 However, this interest does not come without its own set of issues and challenges. As with all extractive industries, the working of natural stone is inherently unsustainable and relies upon ever decreasing resources. This is compounded by environmental and amenity issues and other conflicting development pressures which can limit the availability of otherwise workable resources.

3.3.3 In the case of natural building stone there are also more specific considerations that need to be taken into account in Gloucestershire. These are concerned with:
- The availability of specific requirements for certain building stone types and products;
- The balance of the rural economy and in particular, employment from quarrying, agriculture and tourism;
- The competing interests for mineral resources from other quarry market sectors (e.g. the use of natural stone resources for aggregates).

3.3.4 The following paragraphs seek to explore in more detail the specific local nature and relative significance of these considerations.

Availability of the ‘right’ local stone

3.3.5 Gloucestershire is renowned for its rich and diverse built environment, which is characterised by wide variations in local natural building and roofing stone and vernacular styles. Many traditional local buildings were originally constructed using nearby materials which have unique colour, texture and weathering properties. It is therefore often possible to
identify the exact type and source of the stone that has been used in buildings and thereby to seek to use of a stone that matches the original for new build and especially for use in restoration work. Using the ‘right’ technically suitable, compatible and historically appropriate stone, i.e. stone that closely replicates the original in its appearance, chemical, physical and mineralogical properties, strength and durability, will ensure the continued integrity, regional identity and historic value of the county’s built environment.

3.3.6 However, local provision for the different types of building stone of Gloucestershire can be extremely variable. This is due in part to the number of available quarries still in operation, planning and other constraints that restrict the extension to, and / or opening of new workings, and other land-use pressures that may sterilise un-worked or previously worked resources. Importantly many original, often pre 1947 sources of natural building and roofing stones are no longer worked and supplies of these have been missing from the local market for some time.

3.3.7 The varied availability of local building stone has undoubtedly had an impact on the supply and demand of different building stone products and alternative stones may have had to be used. This is not always possible or acceptable and possibly may have contributed to “stone stripping” which has taken place across parts of the county.\(^{55}\)

**Competition for Resources**

3.3.8 A significant proportion of the county’s limestone and sandstone building and roofing stone resources have the potential to be used as a relatively high specification aggregate mineral e.g. for use in concrete or, in the case of Pennant sandstones, as a high value road surfacing aggregate, and all the building stone resources could be used for lower specification materials such as construction fill. This potential dual use is most clearly exemplified within the Cotswolds resource area where some of the Jurassic limestone formations are an important source of both natural building and roofing stone and crushed rock aggregate. Notwithstanding the higher price per tonne commanded by building stone and a general increase in demand, the influence of other factors such as an uncertain and often fluctuating building stone market and the lower volumes it calls for and the ready availability of lucrative aggregate minerals which, and notwithstanding their lower price per tonne than building stones, will be required in bulk quantities has made ‘hybrid quarrying’ an attractive proposition where the geology and planning permissions allow.

3.3.9 However, hybrid quarries are, by the nature of their product range, more intensively worked and can increase the impact of quarrying on local amenity and the environment. They also increase the rate of extraction

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\(^{55}\) Cotswold District Council has raised concerns over the stripping of stone slates from outbuildings and barns for use in historic repair and other new build projects. This issue was set out in the CDC’s response to the Issues and Options consultation in 2006. It was also an item discussed at the District’s Planning (Regulatory) Committee in December 2006.
and the exhaustion of mineral resources which might otherwise be used in the future for building stone purposes.

3.3.10 A further problem is the use, as an aggregate, of the quarry waste that is invariably generated at building stone quarries where stone is selectively quarried. Ordinarily this material would have a potential role in the restoration of the void. However, if it is instead used as an aggregate, imported fill materials could be needed for the completion of restoration works in the quarry.

Protecting and Enhancing Designations

3.3.11 A significant number of Gloucestershire’s building stone quarries lie within, or close to, important landscape and other natural environmental designations. Therefore, a balance needs to be struck between facilitating new mineral working, for the maintenance of the historic built environment and for sympathetic new build, and ensuring that these valued designations are protected and enhanced.

3.3.12 Many of the quarries are historic in nature and have not been afforded the same degree of consideration and control as seen at more modern operations. Despite efforts to improve matters through stricter new permissions and reviews of planning conditions under the Environment Act 1995 and legislation that covered even earlier planning permissions, many quarries retain examples of inappropriate and poor methods of working represented by, for instance, quarry face instability, a lack of appropriate infill materials and the absence of a comprehensive restoration, afteruse and aftercare programme.

Changing Markets

3.3.13 Although there are well-established markets for natural building and roofing stone in Gloucestershire, their relative importance to each other rarely remains the same from quarry to quarry. The specialist and often, localised demand for certain stone types can create notable differences in sales figures over a period of time. Furthermore, changes in both architecture and design fashions and preferences may result in new and / or expanded business opportunities or shrinking markets. This is particularly the case with the new build market, which includes ornamental pieces, fireplaces, garden landscaping products and high-grade architectural masonry.

3.3.14 In Gloucestershire, there is some evidence that operators have sought to increase their businesses and product ranges to serve an ever-expanding new build market. Although this is an expected part of a well-run business, a degree of caution needs to be taken in facilitating or supporting any notable shifts in the market as this could be to the

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56 Planning and Compensation Act 1991
57 The operators at Farmington, Brockhill, Veizey’s and Stanley’s quarries, all promote associated new-build products such as fireplaces, ornamental landscaping stone, and internal flooring slates along with more traditional stone walling and slate for historic repair and decoration.
disadvantage of supplies of building and roofing stone to the more 'traditional' markets for historic repair purposes.

Quarrying and Processing

3.3.15 Quarrying of any new mineral will require a significant degree of capital investment. This may include acquiring or leasing the site, obtaining relevant licenses and permissions, employing staff and developing site infrastructure. However, the profitability and subsequent viability of certain smaller-scale operations, such as the building and roofing stone quarries, is becoming ever more challenging with rising costs and increased controls and regulation.

3.3.16 In response to these ever increasing economic pressures there has been a degree of consolidation in the ownership and / or operation of Gloucestershire's building stone quarries. This has resulted in the development of local site networks that include several satellite quarries which supply stone to a central quarry with stone processing plant or to a designated stone yard such that a number of activities, including heavy-duty processing, may be carried out only at one centralised location, stone being worked at a satellite quarry only as and when its particular variety of stone is needed.

3.3.17 These types of network have a number of economic benefits in terms of reduced costs and economies of scale but they can pose a number of challenges. These include; increases in local haulage and associated amenity impacts, a potential increase in the lifespan of certain sites due to the husbanding of reserves and the development of more permanent and substantial centralised processing sites / manufacturing operations within rural locations.

58 Examples of consolidated building stone operations in Gloucestershire include: Cotswold Stone Quarries, which runs a total of four sites (Brockhill, Syreford, Swellwold, and Tinkers Barn) and Huntsmans, which also has four sites (Huntsmans, Three Gates, Hornsleasow and Shenberrow).
3.4 Natural Building and Roofing Stone Draft Policy Framework

3.4.1 Like all other mineral resources, natural building and roofing stone can be worked only where it is found. Consequently the options available for its future working are initially determined by the geological distribution of the resource and then the commercial viability of working a particular deposit. Other factors may also influence whether working is a practicable and commercial proposition, some of these may rule out working completely or may just add costs to the development e.g. sterilisation by surface development, the availability of mineral infrastructure; accessibility to markets; and other engineering complexities such as slope instability, flooding etc.

3.4.2 As part of the county’s strategy for mineral extraction the MLP policies will be concerned with the location and the extent of future building and roofing stone extraction in the county and the way in which it is to be controlled to ensure the successful management of the resources in the future. National guidance supports the supply of building stones but unlike aggregates, there is no guidance on the level of future provision for this mineral or on the use of a determining mechanism. In the case of aggregates, this mechanism is a Local Aggregates Assessment and also within Section 2 of this paper.

3.4.3 Due consideration should therefore be given to those policy mechanisms that will support appropriate supplies of local stone to meet demand for historic repair and maintenance purposes and the wider quality of the built environment. These mechanisms include:
   - The safeguarding of resources;
   - The use of policy criteria for assessing new proposals; and
   - The allocation of preferred areas for the future working of natural stone.

3.4.4 As part of the preparation of the MLP stakeholders were encouraged to submit their thoughts and ideas on draft options that were developed following the “issues and options” consultation on the then Minerals Core Strategy and comments received as a result of the mineral forums held in
July 2006\textsuperscript{59}. These investigations culminated in the identification of the preferred option (MPO7b) in 2008 which proposed the expansion of the existing building stone policy in the adopted MLP (2003). The following expanded Policy NE1 seeks to address the requirements of MPO7b.

Draft Policy Building Stone Policy

“Proposals for the winning and working of the county’s key natural building and roofing stones will be permitted only where: -

- it can be demonstrated that the need for the stone cannot be met adequately from existing reserves and that the proposals are predominately for the production of stone to be used as a natural building or roofing stone; and

- any winning and working of rock for non building stone use is a by-product, and is ancillary, to the production of the natural building or roofing stone and is confined to that of overlying or interbedded waste stone that has to be removed in order to work the natural building materials or waste stone arising from the dressing of the building stone and which is unsuitable for on site landscaping or for use in the reclamation of the site; and

- they will help to conserve the historic built environment in Gloucestershire and to maintain its local distinctiveness or are to be used in the conservation of buildings built of the same or similar materials; and

- the proposals demonstrate that the winning and working will increase or maintain employment in Gloucestershire and make a positive contribution to maintaining the rural economy.

3.4.5 As the Mineral Safeguarding Policy is more fully developed that will make the link between those natural building and roofing stone resources which require safeguarding. With regards to a specific criteria for hybrid building stone quarries, where an operator intends to also work minerals for aggregate purposes the draft policy framework for aggregate working outside of preferred areas (see Section 2) will apply.

\textsuperscript{59} On the 11\textsuperscript{th} and 18th July 2006 Gloucestershire County Council held two minerals forums to introduce to stakeholders the key mineral issues facing the then emerging MCS for Gloucestershire. A summary report of the forums can be viewed on the Council website: \url{http://www.gloucestershire.gov.uk/media/adobe_acrobat/c/6/MCS_Forum_Outcomes_Report.pdf}
4.0 Clay

Introduction and Local Policy Context

4.1.1 A small amount of clay is extracted in the county for use in brick making and engineering purposes. The adopted Gloucestershire Minerals Local Plan 1997-2006 has a policy which reflected the absence of any detailed national guidance on clay production or landbanks in respect of brick clay at that time. The MLP noted the widespread occurrence of the clay resources of interest to industry, primarily Carboniferous Coal Measures clays, Lower Lias and Upper Jurassic clays, and where there was a history of clay extraction for a variety of purpose, not all for brick making, the low level of overall production and a high level of reserves at the county’s operating brickworks. The conclusion was then drawn that the future demand was not substantial and that with the exception of demand related to specific end use requirements, such as for flood defence works, it was not appropriate to identify resource areas for future clay working. Accordingly Policy NE2 was included in the MLP:

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<th>MLP Policy NE2</th>
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<td>Proposals for the working of clay will be permitted where its use for a specific purpose outweighs any adverse environmental, local amenity, or other impacts that the development would be likely to have, and would not prejudice the other policies of this Plan.</td>
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4.1.2 Subsequent work on the Minerals Core Strategy resulted in Preferred Option MP06 in the 2008 Preferred Options report which proposed two criteria based policies, one for brick clay and one for clay for other engineering purposes. The preferred options were that

<table>
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<td>The brick clay policy will consider the acceptability of future clay extraction in relation to local brickworks and the exportation of clay to strategic brickwork sites that may lie outside of the county. It will also consider the acceptability of mineral importation and on site stockpiling.</td>
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<tr>
<td>The other engineering (clay) policy will consider the acceptability of future clay extraction in the context of need; local environmental capacity; public amenity; transportation, restoration potential; and opportunities to reuse materials back on site.</td>
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4.1.3 Both of the draft policy approaches in the MCS gained mostly support during the following public consultation but specific support was given to the recognition of potential export of clay outside the county with small and ‘environmentally friendly specialist brickworks being favoured as
these resources may help preserve the vernacular style of the local area. In the case of Cinderford, conditional support was offered where the then emerging Cinderford Area Action Plan (AAP), now the Cinderford Northern Quarter AAP, would not be unduly prejudiced and for clay to serve only local markets. The MPA concluded that overall the emerging policy approach is supported and that this will form the basis of the policy to be contained in the MCS.

4.1 The Clay industry in Context

4.2.1 Clays, shales and fireclays used in the manufacture of bricks and associated products e.g. pipes and tiles have a low unit value which research by the BGS found not to reflect their true importance to the national economy. Nevertheless clay supports a manufacturing industry of considerable importance which has a high value added content.

4.2.2 Since the mid 1960s there has been a decline in brick manufacture though the brick market is still dominated by clay based bricks. This has resulted from less use of common bricks in building, primarily in house building, due to greater use of alternative materials such as concrete blocks and building designs that utilise timber frames though to some extent this decline has been offset by production of engineering and facing bricks, the latter still finding favour as an aesthetically pleasing construction material in high end buildings but also where the local building vernacular is to be maintained. Additionally, many types of clay and shale may, and are, used for other construction and manufacturing purposes such as bulk fill; for use as a restoration capping for completed landfill sites and for an engineered impermeable lining to landfill sites and canals and for use in the production of cement.

4.2.3 The need to provide for a variety of clays to enable blending at brickworks is recognised in the NPPF. Blending clays enables brick manufacturers to vary the physical (strength and durability) and aesthetic qualities of their bricks to widen their appeal and use. Accordingly brick manufacturers may use imported clay to blend with the bulk of their locally won clay deposits that are normally worked alongside the brick plant, the proportions of imports varying according to the method of manufacture and the desired brick specification. Brick manufacture may also necessitate the importation of other non-clay mineral additives for the same purpose.

4.2.4 In 2011 the production of clay and shale in England amounted to only 5.8mt. Annual surveys by the County Council have indicated that this has been up to 70,000tpa (2009) in Gloucestershire for use in the manufacture of bricks, pipes and tiles, but more recently has declined. In contrast the 2011 national production of fireclay, a specialised product

60 Brick Clay: Issues for Planning British Geological Survey
used primarily for refractory purposes and which largely takes place in counties in the Midlands and North East, was much lower at only 154,000 tonnes, with no recorded output in Gloucestershire.

4.2.5 The NPPF has a presumption in favour of sustainable development and acknowledges that minerals are essential to support sustainable economic growth. It also acknowledges that mineral extraction can cause a range of environmental problems which should be accounted for. The method of clay extraction and the relatively low output at most sites means that as a generality clay extraction is not as intrusive as many other forms of mineral activity, though the associated works where clay is used to make bricks etc; may be visually intrusive and arising from this the operation of the plant and the distribution of the finished products can cause noise and traffic problems. Brick clay extraction is often seasonal and excavations lend themselves to restoration, though these can be large and deep but extraction activities can be prolonged.

4.2.6 In contrast, fireclay extraction is commonly associated with opencast coal mining, as opposed to the recovery of the mineral by other means. The mineral forms a ‘seat earth’, a fossil soil that underlies most coal seams and which was originally valued for its refractory properties. However, the term is now used to describe seat earths of interest for both refractory and non refractory applications such as brick making where it is valued for making cream/buff coloured bricks.

4.2.7 Commonly seat earths are kaolinite rich, rooted mudstones and siltstones though sandstones may also be seat earths. Where a seat earth of suitable commercial quality and thickness (generally <1m thick) can be worked at an opencast coal mine it can be stripped and stockpiled for use elsewhere though often it is backfilled into the resultant excavation as part of site restoration works. On such occasions this results in the loss of the mineral.

4.2.8 The BGS report noted that the brick tile and pipe industry is largely dependent on a relatively restricted range of clay resources, these range in age from the Carboniferous clays and shales found in coalfield areas such as Gloucestershire to much younger Cretaceous clays in South East England, though even younger clays (e.g. Estuarine Alluvium) have been used in the soft mud method of brick manufacture.

4.2.9 Locally the clay resources in Gloucestershire are extensive, comprising mainly the Upper Coal Measures clays of the Forest of Dean, Lower Lias Clay deposits of the Severn Vale through the middle of the county and the Vale of Moreton to the east and the Upper Jurassic (mainly the Oxford Clay) of the Cotswolds. At some time or another, these and other clays have been worked for a variety of purposes (bulk fill for

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61 Mineral Extraction in Great Britain 2011. Business Monitor PA1007. DCLG
62 Brick Clay: Issues for Planning BGS
construction works; capping for landfill sites and flood defence works; manufacture of bricks). Apart from the use of clays for brickmaking, planning permissions for the other uses have been granted for a specific short term use and have been strictly time limited.

4.2.10 The county has a long history of brickmaking and this is reflected in the local architecture, many towns once having had its own ‘local’ brickworks. However, in line with the trend in the national industry the number of brickworks and their output has fallen and only two brickworks were active in Gloucestershire in 2012. These produce bricks which are used over a wider geographic area than the county although output, as stated above, is very small.

4.2.11 Between them the two operating brickworks produce a wide range of specialist, quality hand thrown and wire cut bricks, tiles and pavers. Northcot Brickworks in the north east of the county has the largest output and uses Lias clays whereas stockpiled Coal Measures clays and shales are used at the Coleford Brick and Tile in the Forest of Dean. The life of stockpiled clays at Coleford Brick and Tile is estimated to be sufficient for c. 5 years’ production.

4.2.12 Reserves of in situ clay at the Northcot Brickworks are believed to be sufficient for more than 10 years’ production but in order to maintain the range of colours now produced deeper working may be needed. Another, recently closed brickworks in the Forest of Dean, Broadmoor Brickworks, used clays and shales recovered from colliery spoil tips.

4.2.13 Colliery spoil tip clays are extremely heterogeneous and occasionally may have a high residual coal content. This affects their value as a source of brickmaking clay where consistency of feedstock is paramount and where the presence of coal may be a disadvantage in the brickmaking process.

4.2.14 Because clay resources are so widespread and their use, other than for brick making, tends to arise often in connection with specific ‘engineering
projects’ or as an ancillary operation in association with the winning and working of other minerals, such as sand and gravel, it is not possible to estimate future requirements. For the brickworks, however, these have an ongoing need for their clay raw material which is related to the demand for bricks. In general this is determined by the state of the construction market but the popularity of a particular type of brick with architects and their clients will also influence the level of production and the rate at which reserves of the associated clays are diminished.

4.2.15 As part of the production process and to manufacture a range of bricks of different qualities, some brickworks may import clays from other areas which will normally be stockpiled on site with indigenous clays to permit weathering and subsequent blending.

4.2.16 Clay extraction may also be seasonal, with extraction being concentrated in summer months to take advantage of the generally drier weather and to provide sufficient clay stockpiles for production throughout the remainder of the year. Although extraction involves the use of excavators which can be noisy and noise levels will be at their highest during the time intensive extraction takes place, the winning and working of clay is not generally as intrusive as some other quarrying industries in the county. Stockpiles may, however, be large and in exposed locations may cause problems of dust.

4.3 **Key Issues facing Gloucestershire**

4.3.1 The three most recently active brickworks had a relatively low annual output, most recently in the order of about 13 million bricks, but since the closure of Broadmoor this will have declined because Coleford Brick and Tile has a very small output of only handmade bricks. However, the need for additional reserves to maintain production cannot be entirely ruled out during the plan period as the Coleford Brick and Tile site has only limited stockpiles of colliery spoil and does not have an associated clay pit and, as mentioned above, Northcot may need to deepen its clay pit to access suitable clay.

4.3.2 Generally, however, the future demand for Gloucestershire’s brick and clay products is not considered to be such as to warrant the identification of additional facilities and reserves that would be located elsewhere in the county or additional reserves as preferred areas in the adopted MLP.

4.3.3 The provision of clay for one off, short term development projects, as opposed to developing a merchant site for long term supply of a commodity, either to the open market or an associated production/manufacturing site, is a potential issue that cannot be easily accounted for. This is because these transitory sites tend to arise on an intermittent basis and the clay has to be of sufficient quantity and quality to suit the particular project, and these can vary. For engineering
purposes it is very often the permeability of the clays that is important. These sites can be defined as ‘borrow pits’, although this term is more usually associated with the extraction of an aggregate commodity for a specific construction project, commonly a highway project.

4.3.4 The mineralogy, chemistry and physical properties of a clay determine its suitability for brickmaking and the strength, porosity, durability and appearance of the final product after firing. Selective extraction on site, size reduction and moisture control coupled with blending, sometimes with clays from other sites, and the use of additives are necessary to produce a feedstock of consistent quality and an end product which is able to meet increasingly stringent standards relating to, *inter alia*, dimensions, shape, water absorption, frost resistance and soluble salt content.

4.3.5 The main issue facing the county are;
- The need to ensure that the existing brickworks in Gloucestershire have access to sufficient clay to maintain production of a range of quality bricks for both local use and use further afield and to maintain the ‘traditional’ appearance of new buildings;
- The need to ensure that the adverse environmental effects of clay extraction and brickmaking in Gloucestershire are not unacceptable.

4.4 **Draft Policy Framework for Clay**

4.4.1 There has been no significant change in the county or nationally regarding the importance or nature of the two types of clay industry in Gloucestershire since the overarching policy approach of MP06 was proposed by the MPA for inclusion in the then MCS. Therefore, and as indicated by the MPA in 2008, this Policy approach will be taken forward in the MLP in the form of the draft policies overleaf.
Draft brick clay policy
Proposals for the extraction of brick clay will be permitted subject to no adverse environmental, amenity, transport or other impacts arising from the proposals. Proposals for clay extraction in Gloucestershire for the manufacture of bricks outside the county will also need to demonstrate that the proposal is the most sustainable option for the export supply of clay.

Draft engineering clay policy
Applications for the extraction of clay for engineering purposes will be permitted;
- where the requirements of the general minerals policies of this plan are satisfied and the need for clay is demonstrated; and
- where the proposals include provision for the phased restoration of the site within an acceptable timeframe without the need for the importation of fill materials; or
- in the case of clay extraction at an existing mineral site, where the proposal is to use the clay on site and its extraction will not extend the duration of mineral extraction at the site and will not delay restoration or be otherwise detrimental to the restoration potential of the site or the implementation of approved restoration plans.
5.0 Energy Minerals

5.1 Introduction and Policy Context

5.1.1 The adopted Gloucestershire Minerals Local Plan 1997-2006 refers to coal development but makes no specific provision for future needs as there was then no requirement to do so in either national or regional policy - in fact policy guidance was similar then to paragraph 149 of the NPPF. However, with respect to coal the plan has development management policies that allow for the opencast mining of coal and the disposal of colliery spoil (Policy EM1); the recovery of coal/secondary materials from old colliery spoil tips (Policy EM5) and the disposal of colliery spoil and overburden (Policy EM3). The Plan essentially follows the sequential test as previously set out in MPG3.

5.1.2 The MLP also recognises the contribution that small scale underground mining can make to the cultural heritage of the county and the value of old colliery spoil tips to the landscape, ecology and again the cultural heritage of the county (Policies EM2 and EM4). The opportunities that are presented by opencast mining for the reclamation of land previously damaged by coal and other mineral extraction are also noted in the Plan. Some 18 colliery spoil tips are present in the Forest of Dean and five were identified in the MLP as representing an important part of the Forest’s mining history whose safeguarding and sensitive management would be supported by the MPA.

5.1.3 The potential for the recovery of conventional oil and gas in the county and the phases of the development involved in this (see below) are also recognised in the adopted MLP but again there is no specific provision for future needs and unconventional hydrocarbons are not considered as they were largely unknown/unproven then. Policy EM6 provides for permission to be granted for the appraisal and development of oil and gas resources where the development does not adversely affect the environment or harm local communities and accords with other relevant MLP policies.

5.1.4 The adopted MLP notes that guidance with respect to oil and gas was then included in Circular 2/85 ‘Planning Controls over Oil and Gas Operation’. This recognised the nation’s interest in developing indigenous onshore oil and gas reserves and the potential conflict with environmental interests.

5.1.5 At the time, the Circular was expected to be followed by a Minerals Planning Guidance Note (MPG) but although a draft was published it did not proceed to a full MPG as the nation’s energy policy then came under review. Subsequently the Issues and Options report that was produced for consultation in 2006 as part of the Council’s initial work on the Minerals Core Strategy for Gloucestershire posed the question of what
strategy should be adopted for considering future coal extraction. As there was then little evidence of hydrocarbons being a potentially important resource no similar question was posed for these minerals. The responses that resulted from the resultant consultation indicated a preference for a single preferred option which was a continuation of the existing local framework set out in the adopted Structure Plan and MLP. This was subsequently embodied as Preferred Option MP08.

**MP08**

Preferred Option MP08 proposes to apply the existing policy framework for coal resources used in the adopted Structure Plan and Minerals Local Plan. It will include a clear presumption against opencast coal working and associated development in the Forest of Dean unless it can be proved acceptable on local environmental, amenity and economic regeneration grounds, or where sufficient long term local benefits can outweigh adverse impacts. However, for localised small-scale working under ‘freeminers’ rights, support will be given to this type of development where it meets strict environmental standards and contributes towards the cultural and industrial heritage of the area.

5.1.6 The consultation on the preferred options stage that followed similarly resulted in support for this approach which recognises the clear distinction between small scale underground working that in the Forest of Dean would help maintain the heritage and culture of the area and modern opencast operations. However, some respondents raised concerns at this stage about the negative impacts that opencast mining would have on the environment of the Forest of Dean and generally also about the effects that the use of coal (for energy generation) would have on greenhouse gas emissions and thence climate change.

5.2 The Energy minerals industry in Context

**Coal**

5.2.1 The major national role that indigenous coal previously played in contributing towards the country’s energy requirements has spectacularly diminished since the beginning of the 20th century and particularly since the early 1980s. This has been due to a combination of changing environmental attitudes and policies, the availability of cheap coal imports and other energy sources, challenging economics within the domestic industry and changes in the political landscape. This picture is in stark contrast to the fortunes of the oil and gas industry (see below). The historic importance of the deep underground pit started to wane even more from the early 1970s when opencast working began to produce consistent outputs that nationally rose to about 18.5mt in the early 1990s and which, from the mid 2000s, began to match the reduced output from deep mines at about 12mtpa.
5.2.2 Opencast coal mining has latterly replaced deep mining in the UK as the principal source of indigenous coal due mainly to high levels of opencast production in Scotland. Conversely production in England has declined rapidly since the 1980s (c.12mt) to about 3mt in 2010/11 from only 14 operational sites. This method of coal mining has its own set of operating issues and the environmental disadvantages of this surface mining approach to working shallow coal seams, however short lived, frequently meets with local opposition when planning applications are made, especially in some parts of the country.

5.2.3 Notwithstanding the transitory nature of opencast projects and in some instances the opportunity to reclaim land previously damaged by mineral extraction, the objections commonly include the disturbance to the land surface and the associated operational noise, dust and traffic. Nevertheless, coal deposits are widespread in England and resources that are economically attractive still remain and are being pursued by industry, primarily in the North East and the Midlands where sales in 2010/11 were about 1.7mt and 0.7mt respectively. In these ‘traditional’ and previously intensive coal mining areas, employment opportunities and the possibility of improving landscapes previously despoiled by coal mining are benefits that continue to result in favourable decisions on some planning applications for mining.

5.2.4 Centuries of coal mining previously provided the backbone to the industrial economy of the country, itself not as prominent today as in previous decades, but the importance of the industry has been eroded in the face of changes to energy policy, in particular, as underpinned by climate change considerations and a trend towards a less industrialised economic base.

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63 Coal data from United Kingdom Minerals Yearbooks. BGS
5.2.5 In view of the government’s energy and climate change policies and the general presumption against coal mining in the NPPF, it is considered that interest in working the coal resources of the Forest of Dean is unlikely to increase beyond the continuation of freemining. However, because of the history of opencast working in the county and the presence of unworked shallow coal, the possibility of future planning applications for this form of coal mining cannot be totally ruled out.

5.2.6 The coalfield in the Forest of Dean is the principal coal mining area of the county. In this saucer shaped outcrop of Coal Measures strata which extends over an area of c. 90 sq km and which lends itself to opencast mining because of only c. 50m of overburden, and drift mining, the extraction of bituminous coals probably dates back to long before the 13th century. Coal production in excess of 1.4mt was recorded in the 1930s but declined thereafter with deep mining ceasing in 1965. Opencast working that initially flourished in the post Second World War years ceased in 1985. Today such coal mining as there is, is carried out at generally shallow, inclined drift mines that are intermittently operated by freeminers under ancient customs and law.
Although the coalfield is exposed i.e. the deposits are not concealed beneath a thickness of overlying rocks very little is known about the quantity, quality and disposition of the remaining coal deposits that could be recovered by opencast or shallow drift mining though previously these have been estimated to be in excess of 10mt; at the beginning of the 20th century coal reserves in total were estimated to be about 180mt. Many coal seams have been worked in the past but the most important were the 1.5m Trenchard Seam in the Trenchard Formation rocks of the Coleford area and in the overlying Pennant Formation, a predominantly sandstone formation, the 1-1.5m thick, high quality Coleford High Delf Seam which supplied virtually all the output since the Second World War. Younger, overlying seams towards the centre of the basin are also present and have been worked.

The 2003 MLP considered that further deep mining was an unlikely prospect because of unfavourable economics and noted that only 0.75mt of coal had been extracted by opencast mining before those operations finally closed in the mid 1980s. Over the last 20 years there has been occasional interest in opencast working but this has rarely gone any further than exploratory discussions with the Council. The last formal application was to extract 400,000 tonnes of coal at Lightmoor but planning permission was refused on appeal due to the applicants being unable to demonstrate that the impacts were not outweighed by community benefits. For the immediate future therefore, only the traditional, small scale drift mines that are worked by freeminers and which together produce only a few thousand tonnes per year at best would appear to be of any commercial interest.

Although deep coal mining and major surface working ceased years ago, the Coal Authority continues to require the minerals and planning
authorities to safeguard coal resources and has issued a coal referral area consultation map to the councils to be used in the consideration of planning applications for most non coal developments. Further information on this is included in the report on mineral safeguarding areas.

5.2.10 Elsewhere in the county there is a much smaller, shallow coalfield to the north of the Forest of Dean at Newent and a deeper and wholly concealed coalfield, the Oxfordshire-Berkshire Coalfield that lies on the eastern margins of the county at a depth of between 300m and 1500m. This has comparatively thin coal seams which have not been mined and which are regarded by BGS as not being of economic interest for coal64.

Conventional Oil and Gas

5.2.11 Oil and gas play a central role in the UK economy and are the principal sources of energy consumed in the UK, with natural gas having become the most important energy source since 1996. Following the First World War there began a systematic search for home reserves in order to ensure domestic supply and by the 1980s the country became largely self-sufficient, primarily as a result of reserves being exploited around the UK Continental Shelf. By 1999 the UK was a major exporter of oil and gas but since then production of both has fallen and by 2008, 20% of the natural gas consumed in the UK was imported with the expectation that this could rise to 40% by 2010 and 80-90% by 2020. However, this latter figure has been revised down to 45% as a result of anticipated greater energy efficiencies and greater use of renewable energy rather than higher levels of domestic gas production. The UK also became a consistent net importer of crude oil by 2005 with net imports amounting to 14% of the crude oil refined in the UK in 200865.

5.2.12 Onshore oil has been recovered from several areas in Britain since 1851 when there was an important oil shale industry in Scotland but since then the onshore oil and gas industry has been dominated by production in the Wessex Channel Basin in Dorset at Wytch Farm, the largest onshore oilfield in Europe. Even so the onshore oil industry with a peak production of 39.8 million barrels in 1996 (35.3 million barrels from Wytch Farm) and a cumulative output of c.519 million barrels between 1919 and 2009 is dwarfed by the offshore industry which since 1975 had an output of about 23,420 million barrels. Onshore gas production is an even smaller proportion of total production.

5.2.13 It is anticipated66 that even though onshore oil production and particularly gas is small there will be a ready market and continuing need for these minerals for the foreseeable future. Oil and gas play an important role in

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64 Gloucesteshire Mineral Resource Information in Support of National, Regional and Local Planning BGS
65 Strategic Environmental Assessment for a 14th and Subsequent Onshore Oil and Gas Licensing Rounds. Environmental Report. DECC July 2010
66 Onshore Oil and Gas. Mineral Planning Factsheet. BGS 2011
the UK economy and further exploitation will help to ensure a secure and diverse supply chain.

5.2.14 Although oil and gas have been discovered in many locations, discoveries and production in commercial quantities are associated with specific sedimentary basins where there is an appropriate combination of mature source and reservoir rocks and trapping structures. These basins are regarded as being at a mature stage of exploration, having been explored for about 100 years, but they continue to attract interest and large areas have been licensed by the Department for Energy and Climate Change (DECC) for exploration.

5.2.15 Gloucestershire lies to the north of the Wessex-Channel Basin, the pre-eminent onshore hydrocarbons production area in England and at the southern end of the Worcester Basin, which is regarded as a marginally prospective area. Notwithstanding this, parts of the county (the Cotswolds and the Forest of Dean) have been investigated in the past for conventional hydrocarbons following the issue of exploration licenses and seismic and other investigations, including drilling, have been undertaken. Although oil and gas licensed areas in the south of England are primarily located in the south east and central parts of the country, DECC has, however, issued licences in more recent times in South Wales, adjacent to the Severn Estuary, and near Bath on the margins of the Wessex Basin.

5.2.16 The County Council has no information from industry on the disposition or nature of potential, conventional, oil and gas resources in Gloucestershire. This, and the absence of recent exploration licences in Gloucestershire, possibly reflects limited hydrocarbon prospectivity in the county.

5.2.17 Moreover, the mineral resource investigations of the BGS\(^{67}\) show that previous exploratory drilling to investigate the Coal Measures subcrop in the county resulted in all wells being dry, plugged and abandoned though a well towards the centre of the county near Staverton did encounter limited amount of enigmatic gas. Coal Measures in the east of the county are considered to be a ‘high risk’ play by BGS. This information suggests therefore that Gloucestershire has little potential for the recovery of conventional oil and gas.

Unconventional fuels

5.2.18 The declining production of natural gas from conventional gas reservoirs offshore and onshore and, as a consequence, a rise in the importation of natural gas (26% in 2008) has seen growing interest in methods to recover gas from alternative sources, most recently from shales by using the controversial method of ‘fracking’. Alternative fossil fuels, sometimes called ‘unconventional hydrocarbons’, could supplement the

\(^{67}\) Gloucestershire Mineral Resource Information in Support of National, Regional and Local Planning BGS.
‘conventional’ sources and because of its history of coal mining and the presence of coal seams and possibly gas bearing shales the county could therefore attract attention from developers.

5.2.19 Methane is produced during the formation of coal and may be held within the coal seams themselves or may migrate into rocks that surround the seams. Some coal types may contain 10-20 cu. m of methane per tonne of coal68.

5.2.20 In brief the recovery methods are:

- Recovery of methane which may accumulate in active coal mines (Coal Mine Methane or CMM) or in abandoned mines (Abandoned Mine Methane or AMM)
- Recovery of methane from undisturbed (virgin) coal seams (Coal Bed Methane or CBM) often involving hydraulic fracturing of the rock (‘fracking’) to improve their permeability and hence gas recovery
- Recovery of shale gas (methane) from low permeability carbon rich shales that require stimulation by ‘fracking’.
- Recovery of syngas by the combustion of in situ coal seams known as underground coal gasification or UCG.
- CMM, AMM and CBM is captured and used on a limited scale elsewhere in England and Wales and further exploration work on these sources and for UCG continues, albeit outside the county at present. Similarly, exploration licenses for shale gas reservoirs with fracking potential, a relatively new concept in the UK, have been issued, though again not within Gloucestershire.

5.2.21 Considerations, such as the extent of mining, the nature of the coal (degree of maturity) thickness of coal seams and their depth and especially the degree of permeability are hugely influential in determining the potential of coal seams and coal mines for the recovery of methane from them and it cannot be automatically assumed that because coal seams and coal mines (deep and shallow mines are present in the FoD) are to be found within the county that commercially viable resources of gas will also be present. Indeed, gas in coal mines in the Forest of Dean is recorded by the BGS as being absent in most mines and in the unworked Oxfordshire-Berkshire coalfield the average gas seam content is recorded as being 0.4 cu. m/tonne69, far less than levels that have been found elsewhere. BGS also considers the small Newent Coalfield to have little potential for either AMM or CBM. The county is therefore considered to have little potential for AMM because of low gas levels, the fact that workings are not extensive and are flooded, and little potential for CBM, again because of low gas content.

Shale Gas Extraction (Fracking)

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69 Gloucestershire Mineral Resource Information in Support of National, Regional and Local Planning BGS
5.2.22 “Conventional” oil and gas deposits (such as in the North Sea) are contained in permeable rocks, such as sandstone. Shale gas is essentially the same as North Sea gas (i.e. mostly methane) but is trapped in impermeable shale rock. Enlarging or creating fractures in the rock by hydraulic fracturing (or ‘fracking’) enables shale gas to flow. The fracking technique has been used in the UK for many years with conventional deposits. Over 2 million wells have been hydraulically fractured worldwide, mostly in North America.

5.2.23 Like other oil and gas exploration or production, a well is drilled and several stages of metal pipes (“casing”) are set in concrete within the well, to seal it and prevent contamination of surrounding groundwater. A well for shale gas will usually go down vertically to the shale layer and then run horizontally along it.

5.2.24 For shale oil or gas, the rock is then fractured by injecting water at high pressure, an established technique for conventional oil and gas, but used more intensively for shale. Small particles (usually sand) are pumped into the fractures to keep them open when the pressure is released, so gas can flow into the well. 98-99% of the mixture is water and sand. Small quantities of chemicals are normally added to improve efficiency, for example by reducing friction. In the UK, operators must show the Environment Agency that all such chemicals are non-hazardous in their intended application.

5.2.25 Once the rock is fractured, some of the fluid returns to the surface, where it is sealed in containers before treatment. The gas or oil can then flow through the well to surface operations which separate and process the gas or oil. If oil is recovered, it will be taken to an oil refinery or petrochemical plant. Exploration occurs for only a short time and any gas discovered at that stage is likely to be flared, but if a gas well goes into commercial production it will be connected to the country’s network of gas pipelines. The suitable deposits could be very deep at over 1500m – 4000m below the surface.

5.2.26 Although there are extensive deposits of possible gas bearing shales in the county e.g. Carboniferous and Jurassic shales, a 2011 report by DECC suggests that they have little potential for shale gas. However, the Government is keen to develop the shale gas industry in the UK and in December 2012 established the Office of Unconventional Gas and Oil (OUGO). The Office is working closely with regulators e.g. the Environment Agency and the industry to ensure that the regulatory regime is clear and as simple as possible while safeguarding public safety and protecting the environment. For its part the industry has brought forward a package of community benefits, including financial incentives, for communities in areas where exploration involves fracking and where shale gas is commercially extracted.

70 The Unconventional Hydrocarbon Resources of Britain’s Onshore Basins-Shale Gas DECC 2011
Underground Storage of Gas and Carbon

5.2.27 Increasing reliance on imported natural gas and government predictions that by 2020 over 80% of UK gas supply will be imported\textsuperscript{71} has prompted government to recognise and investigate the potential for the subsurface storage of large volumes of this fuel to balance supply whereas concerns about climate change have prompted similar interest in the storage of carbon dioxide to reduce emissions of this greenhouse gas from point sources. Subject to geological conditions, storage is possible in man made voids such as mines or where cavities are formed as part of another type of mineral recovery operation e.g. caverns created by solution mining of salt or in the natural pore spaces of certain rocks in sedimentary basins, such as sandstones, that might form depleted natural gas or oil reservoirs or in rocks and structures which, if they do not contain hydrocarbons, have the ability to hold gas. Storage of gas in salt (halite) caverns is a favoured method of storage because of the almost zero permeability of halite and its ability to ‘self seal’ any fractures due to its annealing properties.

5.2.28 The storage potential for town gas in porous strata near Stow-on-the-Wold, believed to be Keuper Sandstone\textsuperscript{72}, was investigated as far back as the early 1960s but the reuse of depleting oil/gas fields is commonly regarded as the most favourable option for storage of methane. As discussed above, however, there is currently no oil and gas industry in Gloucestershire which could oblige. Moreover, although there has been some exploratory work there appears to be little current interest from industry in further exploration and consequently of proposals coming forward that might achieve the depletion of any resources within the timeframe of the MLP and thereby the creation of potential pore space for subsequent storage of natural gas or carbon dioxide.

5.2.29 Other in situ rocks with a natural porosity and permeability such as limestones also have the potential for storage but there is no indication that the county has been or is likely to be investigated specifically to identify suitable storage strata that would be sought only for its storage potential, especially as other parts of the country potentially have far better natural and man made storage assets.

\textsuperscript{71} Underground Storage. Mineral Planning Factsheet. BGS 2008
\textsuperscript{72} D J Evans 2007. An appraisal of Underground Gas Storage technologies and incidents, for the development of risk assessment methodology. BGS Open Report OR/07/023
5.3 Key Issues facing Gloucestershire

Coal

5.3.1 The generally diminishing enthusiasm nationally for coal mining and the use of coal for energy production coupled with the perceived planning presumption at this level against coal mining suggest that other than small scale freemining, commonly <1000tpa, there is unlikely to be a resurgence in commercial interest in opencast or other mining in the Forest of Dean in the immediate future. Consequently, unlike most other non energy minerals that are worked in Gloucestershire, for which a clear future demand can be foreseen, it is considered that there is no need for the MPA to make specific provision for additional working other than perhaps for the continuation of the ‘cottage’ industry scale freemining operations.

5.3.2 Whilst not contributing much towards national coal supplies and offering only limited, though under current economic circumstance none the less valuable, employment in the county, this industry, if it were to continue in the traditional way, generally also has a low environmental impact that the Forest can probably sustain. However, and notwithstanding the historic ‘value’ of this industry, it is a mineral extraction operation and freemining sites will still have a degree of environmental impact either individually or cumulatively.

5.3.3 Notwithstanding this view on future coal mining in Gloucestershire, safeguarding the entire coal resources in the county (in order to prevent the sterilisation of deposits and to protect development from the effects of historic mining) is still promoted by the Coal Authority which has issued a Coal Mining Development Referral Map for Gloucestershire. This is to be used by the local planning authorities in their consideration of planning applications for development within the referral area, the applications to be referred to the Coal Authority for comment before their determination by the Local Planning Authority (LPA). This consultation arrangement is covered in more detail in the evidence paper on Mineral Safeguarding Areas.

5.3.4 The current low level of interest in the county's coal resources is not to say that from time to time applications to work coal on a larger scale, particularly by opencast methods, might not once again become commercially attractive. This might be due to changing economics, the desire to safeguard and use domestic coal in preference to importing supplies and possibly the degree to which the development of alternative ‘greener’ forms of energy are able to meet increasing demand and effectively replace the use of fossil and other fuels. There might also be some scope to work coal resources as part of other development or regeneration initiatives.
5.3.5 Small scale freemining operations do not involve the major site clearance works associated with opencast mining, which involves the removal of overburden to access the underlying, shallow coal seams, nor the visually intrusive pit head winding gear associated with the mines that used to work coal seams at far deeper depths. Surface operations at freemining sites are often <0.5ha and the amounts of mine waste that are produced, if any, are generally quite small because the coal seams are carefully worked by hand using the pillar and stall method of extraction whereby pillars of rock (coal) are left in situ to help maintain support to the overlying land surface.

5.3.6 Waste from these mine workings is commonly stowed in the underground workings or used on the surface to prepare uneven ground for any necessary, usually low key and rudimentary infrastructure (e.g. coal storage and loading and welfare facilities). Rising costs of operation and the small output and operating budgets of these mines also means that they are often intermittently active. These factors, coupled with the often concealed location of the mines in forested parts of the area, mean that the overall environmental footprint of freemining sites is commensurately low though operations are not completely without potential environmental consequences e.g. the limited traffic implications, engine house operation, mine water disposal and occasional subsidence. Generally, the existing coal mining industry operates at such a low key as not to cause major problems.

5.3.7 New applications for freemining would still be subject to planning law in accordance with the size and scale of operations and so the environmental effects of any mining proposal (operational disturbance and conflict with other interests e.g. nature conservation), the need for coal and the low but nevertheless important contributions to local employment and the economy would be assessed against a range of planning guidance, planning policies and development management criteria in the same way as would larger mining projects.

5.3.8 The coal mining issue that is perhaps most important in the county now, in the face of the ongoing economic recession but a continuing interest in avoiding further environmental degradation including the matter of ground subsidence that may occur with underground mining, and maintaining traditional industries in the Forest of Dean, is how can the MLP enable the freemining industry to be maintained without further damage to the forest environment and how should the legacy of historic mining dereliction be addressed?

5.3.9 Following the closure of the principal mines, much of the surface evidence of the industry was removed. Pit head gear was dismantled and spoil tips were levelled and planted with trees with the result that with the passage of time since much of the dereliction and disturbance caused to the land surface by coal mining has reduced as the land has
become assimilated into the environment. Additionally, some sites/buildings are now being used for non mineral purposes such as industrial estates and in other cases spoil tips have had a new lease of life having been worked for other minerals, such as their sandstone and clay content, for use as building stone or bricks or indeed low quality aggregate. For a variety of reasons the perceptible vestiges of the coal mining industry are now often acceptable without the need for further work to ameliorate any intrusion and to rework some tips would probably do more damage than good.

*Oil and Gas*

5.3.10 The search for other forms of energy minerals in Gloucestershire cannot be entirely ruled out as the county’s geology and mining history offers some, but probably low, potential for this to happen. ‘Fracking’ to release natural gas from shales, the recovery of gas from coal mines, the recovery of coal bed methane or the recovery of conventional natural gas and oil are possible candidates for development in the county. Notwithstanding the choice of development location which could conflict with other land use interests, these potential developments all have environmental implications; some are unique to the particular technique whereas others such as transport, noise and lighting are common to most mineral operations.

5.3.11 Oil and gas resources are vested in the Crown but time limited, though extendable, licences for their exploration, appraisal and production for specified geographical areas on land are normally issued periodically to industry by DECC in successive competitive ‘rounds’. The licences (Petroleum, Exploration and Development Licences) cover conventional oil and gas, including shale gas, virgin coal bed methane and natural gas storage in hydrocarbon reservoirs but do not cover underground gas storage (UGS) and carbon capture and storage. Licences do not confer any exemption from other legal or regulatory requirement e.g. wayleaves from landowners, planning permission, Environmental Impact Assessment or access to coal measures or coal mines (as may be granted by the Coal Authority) and they do not grant consent for actually drilling a well. This has to be obtained from DECC (Well Consent) by submission of and appropriate Petroleum Operation Notice (PONs).

5.3.12 Exploration activities such as temporary geophysical surveys which involve the use of explosives for the investigation of rocks and geological structures that might trap hydrocarbons (reflection seismic surveys) or the drilling of boreholes would, subject to limitations, normally be permitted development under the provisions of the Town and Country (General Permitted Development) Order. However, drilling boreholes for petroleum exploration is not permitted development unlike exploratory drilling for other minerals.

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73 An application for consent to drill a well is made to DECC online using the Well Online Notification System (WONS).
5.3.13 In some instances surveying may be regarded as ‘de minimis’ or not constituting development by the planning authority, as in the case of vibroseis surveys, a commonly used technique where lorry mounted vibrating plates are employed instead of explosives in order to create vibrations for reflection seismic surveys.

5.3.14 Exploration for conventional hydrocarbons i.e. petroleum (oil and natural gas liquids) and gas is usually initiated by a seismic or vibroseis survey which, if the results are encouraging, is followed up by exploratory drilling and if the results from this are promising a period of longer term reservoir appraisal possibly also involving additional drilling to define the exact extent of the find; drilling operations are usually intensive, though short term, especially exploration drilling, but involve a degree of site clearance and construction work.

5.3.15 Recovery of these hydrocarbons may also involve the use of additional wells at other sites in order to fully drain the reservoir. During production, gathering stations may also be needed in order to transport the hydrocarbons by pipeline to an export terminal consisting primarily of storage tanks which may be sited close to the production field or the transport network depending on local circumstances. Oil may also be transported by tanker.

5.3.16 During the primary phase of recovery oil may flow by natural pressure but pumping may then have to be used after this falls away. Pumps known as ‘nodding donkeys’ are then the only indication of a well’s presence. Secondary recovery may be achieved by pumping water or gas into the reservoir to maintain pressure and to enhance the yield.

5.3.17 The production life of a conventional oil and gas field can be over 20 years and sources of alternative fossil fuels could have the same timeframe depending on circumstances. If developments of this nature are proposed in Gloucestershire the complete range of surface and subsurface activities, their implications for the environment and local communities and duration of operations and use of land are clearly important factors to be accounted for in the determination of a planning application or of a proposal that requires approval by the planning authority under the Town and Country Planning General Permitted Development Order. It must be noted that the three phases of development (exploration, appraisal and production) are distinct from each other, though subsequently facilities constructed in one phase may be proposed for use or re deployed in a later phase, and that planning permission for exploration operations does not mean that permission would be automatically granted for subsequent phases.

5.3.18 The same three stages of development are common to unconventional sites as are many of the ancillary facilities need for operations but in the case of CBM/AMM surface installations might also include pumping and
treatment facilities for dewatering mine workings or coal seams and, where fracking is involved, the injection and management of a considerable volume of water. Recovered water may be saline or otherwise contaminated and where water is injected during fracking operations this may contain chemical additives as well as the sand or ceramic beads that act as a proppant to keep open the resultant fractures.

5.3.19 In the particular case of CBM there is usually an incremental approach to production involving the drilling of additional wells to be added to the initial production ‘hub’. Where fracking is employed this may have to be repeated in later years in order to maintain the permeability of the rocks.

5.3.20 The county has the potential to be a source of oil and gas. However, the industry has in the past shown only a little interest in exploring for COG and there has been no indication to the MPA of any interest in developing alternative fossil fuels. Coupled with little available detail on the extent or commercial potential of any hydrocarbon resources in the county, it is not possible and, according to government policy, not necessary to safeguard them for potential future use. Therefore any planning application for their development will have to be considered on its merits against national policy guidance, the MLP policy on hydrocarbons, the policies in this emerging MLP and those in the plans of the District Councils where relevant. The MLP policies seek to minimise any conflict with other land uses and environmental disturbance resulting from the exploration, appraisal and production of COG.

5.3.21 CMM and AMM are recovered in other parts of the country where it is often used to generate electricity on site at active mines or sometimes to provide power to adjacent industrial sites. Depending on the scale and nature of the necessary infrastructure, proposals to do this at abandoned mines are likely to pose more problems than at active mines, particularly if the mines have not been worked for many years and little evidence of the previous industrial use is evident. The NPPF specifically encourages the capture and use of methane from coal mines but mines in the county show little potential for this.

5.3.22 On 17th December 2013 government published a regulatory roadmap for shale oil and gas developers along with a Strategic Environmental Assessment (SEA) report for consultation. This sets out the series of permits and permissions developers need to obtain prior drilling for onshore oil and gas.

5.3.23 The consultation which ran to March 2014 on the SEA will be into further areas of the country which are ‘under consideration’ for the next round (14th) of licences for hydrocarbon exploration which DECC may potentially offer next year. It should be noted that most of
Gloucestershire now falls within one of these areas.

5.3.24 The geology of the county has not yet attracted interest in the recovery of shale gas and therefore the extent and nature of any resources is not yet known. It remains to be seen as whether any operators will pursue any licence applications and whether DECC subsequently issue any petroleum exploration and development licences (PEDL) within Gloucestershire. It is not possible or necessary (NPPF paragraph 25) therefore to safeguard any areas for the recovery of this type fuel.

5.3.25 Any proposals for the recovery of unconventional hydrocarbons that would require planning permission would similarly be determined in light of national policy guidance, the MLP policy on hydrocarbons, the general policies in the MLP and those in the plans of the District Councils where relevant. The MLP policies seek to minimise any conflict with other land uses and environmental disturbance resulting from the exploration, appraisal and production of unconventional fuels.

Gas storage

5.3.26 The geological potential for the storage of gas underground in the county is not considered to be an issue of significance. The MPA has no evidence to indicate a current interest in this type of development in the county or which demonstrates its geological feasibility. Accordingly specific proposals or policies in the MLP are not proposed for this development.

5.3.27 Any planning application for underground gas storage would therefore be determined in light of the guidance in the NPPF and the general development management policies in the MLP and in the plans of the District Councils where relevant and which seek to minimise any conflict with other land uses and environmental disturbance resulting from the installation and operation of the plant for the injection, recovery, distribution and use of any gas.

5.4 Draft Policy Framework for Coal proposals

5.4.1 Little has changed in the Forest of Dean since Preferred Option MO8 was drafted for the MCS. This overarching policy approach accords with the NPPF and is considered to remain as valid and as relevant to the circumstances in Gloucestershire now as it was in 2008. The following policies are proposed

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<th>MLP Policy for Small Scale Coal Underground Mines</th>
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<tr>
<td>Proposals for small scale coal underground mines, which contribute to the cultural and industrial heritage of the Forest of Dean will be permitted where they are environmentally acceptable in accordance with the other policies of this plan.</td>
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</table>
MLP Policy for Opencast Coal
Proposals for the extraction of coal by opencast methods in the Forest of Dean will not be permitted unless it is environmentally acceptable. In particular this would include being able to demonstrate that there would be no adverse impact on public access, sensitive land uses, public amenity, settlements, tourism and recreation and the economic regeneration of the area.

MLP Policy from re-working of colliery spoil tips
Proposals for the re-working of colliery spoil tips for coal or other minerals will not be permitted unless they are environmentally acceptable. In particular proposals should accord with the other policies of the MLP and during the extraction period or following the completion of extraction as appropriate they provide an improvement to the landscape quality, wildlife interest and/or industrial heritage of the Forest of Dean.

Draft Policy Framework for Conventional and Unconventional Oil and Gas
5.4.2 The limited geological potential in Gloucestershire for the recovery of conventional and unconventional hydrocarbons and thence possibly for gas storage in depleting oil and gas reservoirs should they be found and worked, for gas storage in natural caverns or cavities in competent lithologies or in salt caverns, again should deposits be found and worked, coupled with the absence of any recent interest in exploration and limited geological information, indicates that the MLP proposals and policy options for the production of hydrocarbons or for underground storage of gas are such that they cannot be spatially defined in terms of safeguarding potential areas or specific sites for development.

5.4.3 The following policy is therefore proposed;

Draft MLP Policy for conventional and unconventional oil and gas
Proposals for the exploration, appraisal and production of conventional and unconventional hydrocarbons or for the underground storage of gas or carbon will be permitted only where the development does not adversely affect the environment or harm local communities, accords with all other relevant planning policies and includes detailed plans and proposals covering the duration of operations, removal of all buildings, plant and equipment and the restoration of the site.
Appendix A GLOSSARY and List of Abbreviations

SWRA - South West Regional Assembly
MLP – Minerals Local Plan
MCS – Minerals Core Strategy
MPA – Mineral Planning Authority
RSS – Regional Spatial Strategy
FoD – Forest of Dean
UTV – Upper Thames Valley
CWP – Cotswold Water Park
AMM – Abandoned Mine Methane
CMM – Coal Mine Methane
CBM – Coal Bed Methane
BGS – British Geological Survey
DECC – Department for Energy and Climate Change
OUGO – Office of Unconventional Gas and Oil
UGS – Underground Gas Storage
PONs – Petroleum Operation Notice
COG - Conventional Oil and Gas

SILICEOUS MINERALOGY

BROWNSTONE – A type of sandstone used for building stone purposes. In Gloucestershire it occurs as a purple-red and green stone and outcrops in the Forest of Dean

BUILDING STONE – Naturally occurring rock, which is sufficiently consolidated to enable it to be cut or shaped for use as a walling, paving or roofing material

CARBONIFEROUS – A major division of geological time. It approximately covers the period between 360 and 280 million years ago

COMMUNITIES AND LOCAL GOVERNMENT (DCLG) – The Government department responsible for spatial planning and other local government matters

CORE STRATEGY – Sets the long-term spatial vision and strategy for the local planning authority area and provides the strategic locations for future development opportunities

CONGLOMERATE – a rock that consisting of individual stones that have become cemented together.

DEVONIAN – Is a geological period spanning from roughly 420 to 360 million years ago.

DEVELOPMENT PLAN – Sets out the policies and proposals for development and the use of land within the local planning authority area

DEVELOPMENT FRAMEWORK – A non-statutory term for describing the folder of documents, which includes all the local planning authority's local planning documents

FREESTONE – Any stone that can be freely worked in any direction.

JURASSIC – A major division of geological time. It covers the period between 200 and 130 million years ago
LANDBANK – The stock land with planning permissions but where development has yet to take place. Landbanks are commonly used for land, minerals, housing

MASONRY STONE – Used in construction and is more often bonded with mortar. It can be structural or as a cladding or paving.

MINERAL PLANNING STATEMENTS (MPS) – Guidance documents, which set out national policy for minerals

OOLITIC LIMESTONE – A carbonate rock made up mostly of ooliths (or ooids), which are sand-sized carbonate particles that have concentric rings of CaCO₃ (Calcium Carbonate). These rings are formed around grains of sand or shell fragments that were rolled around on the shallow sea floor, gathering layer after layer of limestone

PENNANT SANDSTONE – The term used to cover all sandstone quarried from the Carboniferous period that outcrop in South Wales and the Forest of Dean in Gloucestershire

PERMIAN – A relatively short period of geological time between 280 and 250 million years ago

PREFERRED AREA – Areas identified in the development plan with a high degree of certainty for potential development / extraction (in the case of minerals)

RESERVES – Known mineral deposits with the benefit of planning permission for extraction

RESOURCES – A potential mineral deposit where the quality and quantity of material has not been fully tested. Resources do not benefit from planning permission

SOUTH WEST REGIONAL SPATIAL STRATEGY (RSS) – The 20-year spatial strategy for the South West region

SPATIAL PLANNING – Spatial planning goes beyond traditional land use planning to bring together and integrate policies for the development and use of land with other policies and programmes which influence the nature of places and how they function

TRIASSIC – Is a relatively short geological period from roughly 250 to 200 million years ago
APPENDIX B Key Natural Building and Roofing Stones in Gloucestershire

Devonian
Lower
Old Red Sandstone

Carboniferous
Carboniferous Limestone Series
Pennant Group

Jurassic
Inferior Oolite Limestone Group
Crickley Limestone (Pea Grit)
Lower Freestone (Birdlip Stone)
Guiting (Yellow) Stone
Notgrove Freestone
Oolite Marl and Upper Freestone
Salperton Stone
Witchellia Stone (Cleeve Hill Stone)
Great Oolite Limestone Group
Chipping Norton Stone
Cornbrash
Cotswold Limestone
Dagham Stone
Fullers Earth
Forest Marble
Hampen Stone
Taynton Stone
Througham Tilestones
Stonesfield Slates
Eyford Stone
White Limestone
Appendix C Natural Building and Roofing Stone – Production and recent site numbers (Data provided in tonnes unless otherwise stated)

Natural Building and Roofing Stone - Supply Data 2008 – 2012

<table>
<thead>
<tr>
<th>Supply Year</th>
<th>Limestone*</th>
<th>Sandstone</th>
<th>Total Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>39,382</td>
<td>16,696</td>
<td>56,078</td>
</tr>
<tr>
<td>2009</td>
<td>37,580</td>
<td>9,310</td>
<td>46,890</td>
</tr>
<tr>
<td>2010</td>
<td>44,631</td>
<td>12,684</td>
<td>57,315</td>
</tr>
<tr>
<td>2011</td>
<td>38,640</td>
<td>11,266</td>
<td>49,906</td>
</tr>
<tr>
<td>2012</td>
<td>48,884</td>
<td>12,094</td>
<td>60,978</td>
</tr>
</tbody>
</table>

* Limestone Sites in the Forest of Dean and Cotswolds have been combined

Natural Building and Roofing Stone Sites# Data 2008 - 2012

<table>
<thead>
<tr>
<th>Supply Year</th>
<th>Number of Limestone* Sites</th>
<th>Number of Sandstone Sites</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>In production</td>
<td>Not in production</td>
<td>In production</td>
</tr>
<tr>
<td>2008</td>
<td>14</td>
<td>15</td>
<td>10</td>
</tr>
<tr>
<td>2009</td>
<td>16</td>
<td>12</td>
<td>8</td>
</tr>
<tr>
<td>2010</td>
<td>18</td>
<td>10</td>
<td>8</td>
</tr>
<tr>
<td>2011</td>
<td>15</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>2012</td>
<td>14</td>
<td>12</td>
<td>8</td>
</tr>
</tbody>
</table>

* Limestone Sites in the Forest of Dean and Cotswolds have been combined

# Includes some sites classified as “Dormant

+ This is only referring to building and roofing stone production, some sites may have been “in production” for purposes other than building and roofing stone during a given year.
Appendix D
Historic / Relic Quarries in Gloucestershire

IMPORTANT INFORMATION: - The quarries listed below represent old mineral workings in Gloucestershire which were previously granted planning permission but which no longer have valid planning permissions. These quarries were once worked for building stone amongst other quarried products such as aggregates and agricultural lime and would have likely contributed to the different types of building stone supplied in the county. Whilst there are other quarries which produce the same or similar stone types to those found at a number of the listed sites, there may be historic / relic quarries that represent the only local source of a certain stone type that could be required in the future. Consequently, the inclusion of these sites within this evidence paper of the MLP may assist in the development of a deliverable safeguarding policy for ensuring the necessary diversity in local building stone types.

It is also important to acknowledge that the list is not exhaustive. It is based on the survey work carried out by the County Council as part of the “Review of Old Mineral Permissions (ROMPs)” which was required under Environment Act 1995. The survey looked to identify those sites in the county which ceased to have a valid planning permission under the provisions of the Act. Decision on this basis were made under paragraph 12 of MPG14, which stated that planning permissions which were no longer capable of implementation, had time expired, or had been worked out and restored should be discounted from future review and thus ended.

NB Sites in bold text are listed on the Stone Atlas database for Gloucestershire; those in black are not on this database but they may have been recorded under another name. Furthermore, it is also important to note that older workings, which operated but were subsequently closed prior to the advent of the planning system in 1948, are not included in the list. Many of these (>200) are recorded on the Stone Atlas database. However, as more evidence becomes available particularly from English Heritage and the County’s Archaeology Unit, additional sites may need to be added to the database of stone sites. The list is divided between the generic resource groups of:

Carboniferous (Forest of Dean) Limestone,
Forest of Dean Sandstone, and
Jurassic (Cotswold) Limestone

Carboniferous (Forest of Dean) Limestone
Bearse
Bluestone (Proberts Farm)
Boatwood
Clearwell (Village)
English Bicknor

Staunton
Stowfield Farm
Tidenham Chase
Whitecliff
Woodcroft (Lancau)
Worrells

Edge Hill
Galders Wood
Hawthorns
Little Drybrook
Plump Hill


### Forest of Dean Sandstone

<table>
<thead>
<tr>
<th>Location</th>
<th>Location</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Addis Hill</td>
<td>Gorsty Knoll</td>
<td>Knockley</td>
</tr>
<tr>
<td>Brand Green</td>
<td>Forest of Church</td>
<td>Lambquay</td>
</tr>
<tr>
<td>Collafield (Greenway)</td>
<td>Hangerberry</td>
<td>Milkwall</td>
</tr>
<tr>
<td>Darkhill</td>
<td>Howbeach</td>
<td>Miss Grace’s Lane</td>
</tr>
<tr>
<td>Eastbach</td>
<td>Howlers Hill</td>
<td>Spion Kop</td>
</tr>
<tr>
<td>Edge Hill (Hazel Hill)</td>
<td>Howlers Slade</td>
<td>Sterry</td>
</tr>
</tbody>
</table>

### Jurassic (Cotswold) Limestone

<table>
<thead>
<tr>
<th>Location</th>
<th>Location</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bath Road, Tetbury</td>
<td>Edge</td>
<td>Pyke</td>
</tr>
<tr>
<td>Bourton</td>
<td>Fish Inn</td>
<td>Quarhouse</td>
</tr>
<tr>
<td>Breakheart</td>
<td>Forest Green</td>
<td>Ready Token</td>
</tr>
<tr>
<td>Burleigh</td>
<td>Foss Cross</td>
<td>Salperton</td>
</tr>
<tr>
<td>Broadfield Farm (Lodge Park)</td>
<td>Gawcombe</td>
<td>Sheepridge</td>
</tr>
<tr>
<td>Cats Abbey</td>
<td>Hampen Farm</td>
<td>Slade</td>
</tr>
<tr>
<td>Catsbrain</td>
<td>Harvey’s Grave</td>
<td>Smiths Cross</td>
</tr>
<tr>
<td>Cirencester Road</td>
<td>Hillbarn (Snowshill)</td>
<td>Station Road</td>
</tr>
<tr>
<td>Coln Lane Ground</td>
<td>Honeycombe Leaze</td>
<td>Stratton</td>
</tr>
<tr>
<td>Coates (Jarvis Quarry)</td>
<td>Ilsom Farm</td>
<td>Sunhill</td>
</tr>
<tr>
<td>Coopers Hill</td>
<td>Jackdaw</td>
<td>Vatch Lane</td>
</tr>
<tr>
<td>Cotstone (Longhill)</td>
<td>Kilkenny</td>
<td>Welsh Way</td>
</tr>
<tr>
<td>Dean (Chedworth)</td>
<td>Leckhampton</td>
<td>Winterwell</td>
</tr>
</tbody>
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