Oxfordshire Minerals and Waste Development Framework

Sustainability Appraisal/Strategic Environmental Assessment

Revised Minerals Spatial Strategy Options

September 2010

Revision Schedule

SA Report – Revised Minerals Spatial Strategy Options

September 2010

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1 Introduction

1.1 Oxfordshire Minerals and Waste Development Framework

The Council is preparing a Minerals and Waste Development Framework (MWDF) for Oxfordshire. The Minerals and Waste Core Strategy Development Plan Document (MWDPD) will form a key part of the MWDF and will provide a strategic vision and overall strategy for meeting known and anticipated minerals and waste development requirements in Oxfordshire over a 15 year period.

With regard to minerals, the Core Strategy DPD will identify a spatial strategy for sand and gravel and crushed rock extraction to meet need as well as maintain land banks for primary aggregates in line with national policy and guidance.

1.2 Minerals Spatial Strategy Options

In February 2010, the Council prepared an initial draft set of spatial strategy options for sand and gravel, soft sand and crushed rock working. Consultation with key stakeholders on the spatial strategy options was undertaken during July 2010 and this has led to further refinement of the spatial strategy options. The key changes to the options are:

- The extent of the areas in each of the options has been reduced through an assessment of the realistically workable geological resource, using data from the BGS geological mapping of sand and gravel and Mineral Assessment Reports.

- Sites which are designated for their national environmental or landscape importance have been removed from the options, such as Special Areas of Conservation (SACs), Areas of Outstanding Natural Beauty (AONBs) and National Nature Reserves (NNRs). Smaller sites such as Sites of Special Scientific Interest (SSSIs) and Scheduled Ancient Monuments (SAMs) which fall within these option areas will be given policy protection in the Core Strategy.

- The phased approach for sand and gravel has been changed to address the need for mineral working only during the plan period; and it focuses more on moving to new areas of working than on continuation of working in existing areas (albeit this would still be likely to be needed in the short term).

- Both the concentration on existing working areas approach and the new areas of working approach for sand and gravel are concentration strategy options; and are not related to the location of demand. (Location of demand will be a factor to be used in assessing the options rather than in defining them.)

- Possible new areas of working are not included in the same option as concentration on existing working areas, to provide greater distinction between options.

- The dispersed working approach for sand and gravel seeks to disperse working across all available resource and is not related to the location of demand.

The Council is consulting on the revised spatial strategy options with key stakeholders in summer 2010 and is working towards a preferred minerals strategy for public consultation later in 2010.

1.3 Background to Appraisal

Scott Wilson was commissioned by Oxfordshire County Council to undertake an independent Sustainability Appraisal incorporating Strategic Environmental Assessment[1] (hereby referred to as SA) of the draft spatial strategy options for mineral working (February 2010) and of the revised options in August 2010. This report relates to the appraisal of the revised options. The findings of the SA of the initial Minerals draft spatial strategy options[2] can be obtained from the Council's website.

SA seeks to identify the economic, social and environmental impacts of a plan and suggests ways to avoid or minimise negative impacts and maximise positive ones.

1.4 Appraisal Methodology

SA Framework

The revised options were appraised against the already established SA framework for the Oxfordshire MWDF. The SA framework objectives are compiled using the information gathered during the early stages of the Scoping process and cover the full range of environmental impacts stipulated by the SEA Directive and the Regulations, and the broad range of economic and social issues proposed in the current guidance on SA[3].

The objectives also reflect regional sustainability objectives as well as feedback from a range of consultees to ensure they capture the key sustainability issues relevant to the County. The table below outlines the SA framework including the underlying sub-objectives and indicators.

[1] As required through the Strategic Environmental Assessment Directive (2001/42/EC).
[2] Scott Wilson (May 2010) Oxfordshire Minerals and Waste Development Framework, Minerals Spatial Strategy Options SA/SEA Report
3 ODPM (2005) Sustainability Appraisal of Regional Spatial Strategies and Local Development Documents

Table 1.1 the SA Framework

SA Objective	Appraisal Criteria/Sub-objectives	Possible Indicators
1. To protect, maintain and enhance Oxfordshire's biodiversity and geodiversity including natural habitats and protected species	Will the MWDF protect, maintain and enhance UK BAP Priority Habitats?	Number of permitted applications for minerals and waste development which include a restoration scheme which contributes to the objectives of Oxfordshire Habitats Plans for the creation of calcareous grasslands, lowland acid grassland and reedbeds
		Number of planning applications which have an impact on designated sites or BAP habitats
	Will the MWDF conserve and enhance internationally, nationally and regionally important sites of nature conservation importance?	Number of permitted applications which result in restoration of favourable/favourable recovering condition or buffering of designated areas through appropriate habitat creation.
	Will the MWDF protect, maintain and enhance UK BAP Priority Species?	Number of permitted applications for minerals and waste development which include a restoration scheme which contributes to the objectives of Oxfordshire Species Plans.
	Will it contribute to the aims of the Conservation Target Areas?	Contribution of the MWDF policies to Conservation Target Areas for restoration of minerals and waste management sites.
	Will it protect and conserve geological SSSIs and RIGs?	Number of permitted applications which include conditions for the protection or enhancement of RIGS or geological SSSIs.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	Will the MWDF conserve and enhance Oxfordshire's AONBs & their settings and take into account guidelines associated with specific landscape types?	Number of permitted applications for Minerals and Waste development which include conditions for the protection or restoration of statutory or non-statutory landscape designations.
	Will the MWDF protect and enhance the historic and	Number of permitted applications for Minerals and

	prehistoric environment of Oxfordshire?	Waste development which include conditions for the protection or enhancement of the historic and prehistoric environment in Oxfordshire.
3. To maintain and improve ground and surface water quality	Will the MWDF affect groundwater quality?	Number of permitted applications affecting source protection zones 2 and 3 Number of permitted applications which assess the risk of contamination of groundwater
	Will the MWDF affect surface water quality?	Number of sites within 50m of a watercourse
		Number of permitted applications requiring abstraction licences
4. To improve and maintain air quality to levels which do not damage natural systems	Will the MWDF lead to increased traffic congestion in built up areas?	Number of permitted applications with routeing agreements which avoid AQMAs Survey of trip generation to civic amenity sites
	Will the MWDF lead to increased dust and/or odours?	Number of complaints relating to dust/odours
5. To reduce greenhouse gas emissions to reduce the cause of climate change	Will the MWDF lead to a decrease in production of greenhouse gases such as methane?	Proportion of waste and aggregates transported by rail or water Quantity of biodegradable wastes landfilled
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	Number of sites that are permitted within flood risk zone as identified by PPS25.	Number of permitted sites for minerals and waste development within the flood plain (flood zone 3a/) Number of mineral restoration schemes identified for flood attenuation
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	Will the MWDF reduce distances travelled by road?	Distances travelled by road from new applications to settlements (waste) or markets Number of sites with rail/water access
	Are sites in the MWDF well located in relation to surrounding settlements for waste, or minerals for markets?	Number of sites with suitable access to appropriate roads
	Will the waste facilities or mineral operation serve local needs?	
	Does the MWDF facilitate HGV routeing agreements and developer contributions for infrastructure improvements?	

8. To minimise negative impacts of waste management facilities and mineral extraction on human health	Will the MWDF have impacts which could have a harmful effect on human health?	Number of permitted applications for mineral or waste development within 250m of sensitive receptors (settlements)
9. To minimise the negative impacts of waste management facilities and mineral extraction on local amenity	Will the MWDF result in loss of amenity through visual impact, noise, dust or vibration for local communities? Will the MWDF provide opportunities for enhancement of local amenity and access to the countryside?	Number of sites for mineral or waste development within 250m of sensitive receptors (settlements) Number of permitted applications with restoration conditions which enhance local amenity and /or improve access to the countryside.
10. To protect, improve and where necessary restore land and soil quality	Will the MWDF affect high grade agricultural land?	Area of high grade agricultural land lost to minerals and waste development
	Will the MWDF lead to soil pollution or contamination?	Incidences of land contamination related to minerals and waste development
11. To contribute towards moving up the waste hierarchy in Oxfordshire.	Will the MWDF policies reduce the amount of waste produced?	Amount of waste arising in Oxfordshire
	Will the MWDF encourage re-use, recycling/composting and recovery?	Amount of waste recycled and recovered
12. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to the appropriate minerals apportionment		Number of permitted applications for waste management to meet targets to achieve net waste self sufficiency. Number of permitted applications which contribute to meeting apportionment.
13. To promote efficient use of natural resources and avoid unnecessary sterilisation of mineral resources	Will the MWDF encourage use of secondary and recycled aggregates, and make provision for these sites? Does the MWDF encourage minimising the area of land take per tonne of mineral aggregate produced?	Number of permitted applications for secondary and recycled aggregate developments.
	Will the MWDF avoid sterilising mineral resources by preventing unnecessary development on or near to mineral resources?	Identification of mineral safeguarding areas in the MWDF
	Will the MWDF promote dialogue between local authorities to ensure valuable	Evidence of cross-boundary liaison meetings

	mineral resources are not sterilised by non-minerals development?	
14. To support Oxfordshire's economic growth and reduce disparities across the county.	Will the MWDF generate new jobs for the county?	Number of direct jobs created in the waste/mineral sector per year
	Will the MWDF support and encourage the growth of small and medium size business?	Number of new mineral and waste permissions
	Will the MWDF encourage the provision of more locally based skills and facilities?	

Approach to Options Appraisal

The appraisal involved assessing each of the revised spatial strategy options for mineral working against the SA objectives taking account of both potential positive and negative effects. The appraisal also takes into account other impact dimensions, including whether the effects are primary, secondary, direct, indirect, permanent, short-term, medium-term, long-term or cumulative (the term cumulative effects is also used to describe synergistic and secondary effects).

Matrices were used to identify the sustainability effects and these are provided in Appendix 1. The matrices allow for the comparison of options and also consist of a summary of the principle underlying each of the options.

The appraisal was based on a combination of expert judgement and analysis of baseline data gathered in the Scoping Report and other available background information. Due to the strategic nature of SA, it is difficult to make predictions with a high degree of certainty and more detailed information is required in some instances. Where this is the case, detailed assessments are recommended at the site selection and planning application stages in order to further confirm the likelihood of impacts and their magnitude and propose mitigation measures where relevant. The table below shows the symbols used when completing the matrices.

A new symbol +/- has been included in the table below to denote where an option has both positive and negative effects *(this was due to the fact that different options consisted of various potential areas of mineral working and in some cases there were potential negative effects associated with working some areas identified within an option and some potential positive effects associated with other areas in the same option).*

Table 2.2 Appraisal symbols

Symbol	Likely effect on the SA Objective
++	The option is likely to have a **very positive** impact
+	The option is likely to have a **positive** impact
0	**No significant effect / no clear link**
?	**Uncertain** or **insufficient information** on which to determine impact
-	The option is likely to have a **negative** impact
- -	The option is likely to have a **very negative** impact

+/-	The option is likely to have some positive and some negative effect

1.5 Consideration of the Business as Usual Option

Currently, planning policy for minerals and waste in Oxfordshire is contained in the Oxfordshire Structure Plan 2016 and the Oxfordshire Minerals and Waste Local Plan (MWLP, adopted July 1996)[4]. Following changes to the planning system in 2004, policies in existing plans were 'saved' for three years to September 2007, when they would expire unless the Secretary of Stare agreed to 'save' them beyond that date.

Accordingly, Oxfordshire County Council applied to the Secretary of State for policies in the MWLP that met the criteria specified by the Government to be saved beyond September 2007. This resulted in 46 policies in the MWLP to continue to be 'saved'. Three policies in the Oxfordshire Structure Plan are also saved beyond the expiry date, including a policy on criteria for locating sand and gravel working.

As part of the MWDF preparation process, the Council considered the merits of continuing to rely on the current planning policy framework. However, it was decided that this option was not sustainable and would not provide a clear long term strategy for future minerals and waste development in Oxfordshire for the following reasons:

- Some saved policies from the previous plan may be out of date in relation to current policy and legislation; and
- Very few areas which are allocated in the Local Plan for minerals extraction are still to be worked.

This option was therefore not given further consideration by the council, and it has not been appraised further in the SA.

1.6 Sand and Gravel Sub-regional Apportionment

When he revoked the South East Plan in July 2010, the Secretary of State for Communities and Local Government issued guidance[5] for planning authorities. This says that mineral planning authorities should now work from the aggregates apportionment in the March 2010 Proposed Changes to South East Plan Policy M3, which set a sand and gravel figure of 2.1 million tonnes a year for Oxfordshire. The guidance goes on to say that an alternative figure can be used if it is based on new or different information and a robust evidence base.

The County Council is opposed to the figure of 2.1 million tonnes a year and believes it is unreasonably and unrealistically high. The Council therefore intends to gather information and evidence, and develop a methodology, to produce a locally derived assessment of the quantity of sand and gravel that should be supplied from quarrying in Oxfordshire.

[4] www.oxfordshire.gov.uk

[5] Chief Planning Officer Letter: Revocation of Regional Strategies, July 6, 2010.

As an interim position, a range of possible figures for sand and gravel are being used against which to test options. The County Council is looking at using a range between 1.1 and 1.6 mtpa, based on average sand and gravel production over the last 5 year (1.15 mtpa) and 10 year (1.48 mtpa) periods and the apportionment proposed by SEERA in March 2009 (1.58 mtpa).

Although the County Council is opposed to the Secretary of State's guidance figure of 2.1 million tonnes as set out in the March 2010 Proposed Changes, it is a recommendation of this SA process that spatial strategy options should also be tested against this guidance figure as part of the options development process and sustainability appraisal.

2 Results of the Options Appraisal

2.1 Sharp Sand and Gravel Options

As detailed in section 1.6 above, the Council has adopted a flexible approach with regard to the amount of sand and gravel it needs to plan for, to meet demand to 2026, using a range between 1.1 and 1.6 mtpa.

Historically this figure has been divided between provision for sharp sand and gravel and soft sand, based on an average of the last 3 years' sales. This has resulted in a split of 83% for sharp sand and gravel and 17% for soft sand.

The council has revised the initial draft spatial strategy options and is now considering the following revised options for sand and gravel.

Option 1: Concentration on Existing Working Areas

This option seeks to concentrate sand and gravel working in areas where working is currently taking place or has taken place recently. This is a refinement of the previous option 1c and includes areas both to the west / north west and south / south east of Oxford. However, these are now limited to areas around existing or recent sand and gravel working areas and include:

- Lower Windrush Valley (LWV);
- Eynsham/Cassington/Yarnton (ECY);
- Radley; and
- Sutton Courtenay.

Option 2: Concentration on New Working Areas

Many areas of existing working have experienced mineral extraction over a number of years, impacting on local communities and changing the local landscape. This option identifies new areas where working would be concentrated, to replace existing areas of working. In the short term, while the new areas are planned, some extensions to existing sites might be needed to maintain supply. The areas included in this option are:

- Clanfield/Bampton;
- Warborough/Shillingford/Benson (WBS);
- Cholsey;
- Sutton/Stanton Harcourt; and
- Culham/Clifton Hampden/Dorchester (CCD).

Option 3: Dispersed Working

The initial draft dispersal option sought to disperse working related to markets, to reduce mineral miles. This option has been amended to provide for working to take

place within any of the areas of potential sand and gravel resource, so that it is a truly dispersed option. The areas included in this option are:

- Finmere;
- Clanfield/Bampton;
- Lower Windrush Valley (LWV);
- Eynsham/Cassington/Yarnton (ECY);
- Faringdon;
- Radley;
- Sutton Courtenay;
- Warborough/Shillingford/Benson (WBS);
- Cholsey;
- Caversham;
- Culhum/Clifton Hampden/Dorchester (CCD); and
- Sutton/Stanton Harcourt.

Sand and Gravel Options - Summary of SA findings

Option 1 – This option would lead to concentration of working in existing and former areas of sand and gravel working. Although the proposed areas are generally well located in terms of proximity to important nature conservation sites, some areas within ECY and the LWV are close to important nature conservation designations (SSSIs, SAC). These designations could constrain working in some sites within these areas. Where there is potential for adverse effects due to proximity to nature conservation sites, mitigation measures should be put in place to protect these areas.

The LWV lies within the Conservation Target Areas (CTAs) identified by the Oxfordshire Nature Conservation Forum[6] . The main aim within CTAs is to restore biodiversity at a landscape-scale through maintenance, restoration and creation of BAP priority habitats. Further working in this area would therefore contribute positively to the planned restoration and habitat creation at a large-scale which combined with existing restoration plans would have significant beneficial cumulative effects for the local community and wildlife. However, these benefits would be in the long-term as mineral works are likely to take years before the restoration plans are implemented.

There are no national landscape designations in any of the areas proposed within Option 1. However, increased working in the identified areas has potential for negative cumulative landscape and visual effects for the local communities living nearby. Measures to mitigate against negative effects on the already extensively modified landscapes should be required at site selection and planning application stages.

[6] http://www.oncf.org.uk/biodiversity/cta.html

SAMs are found within each of the option 1 proposed areas. Mineral working can lead to damage to archaeological features and so sites should be well sited away from these and where they are in close proximity, mitigation measures against adverse effects should be in place (where applicable) before extraction of materials.

Some areas within LWV, ECY, Radley and Sutton Courtenay lie within flood risk zones 2 and 3. The Environment Agency (EA) requires that development should be avoided in the floodplain where possible and would require the sequential and (where appropriate), the exception tests as required through Planning Policy Statement 25 (PPS25). There is potential for cumulative negative effects on ground water flow as a result of concentration of mineral workings within one area and in particular in the LWV and the Cassington area.

Although option 1 involves continuing working in existing areas of sand and gravel extraction, the County Council has confirmed that this option if taken forward would seek to continue the existing pattern and level of working and so it is anticipated that there would not be significant increases in traffic along the A40 (ECY and LWV), the A415 (LWV), or the A4130 (Sutton Courtenay). However, working in the Radley/Nuneham Courtenay area could lead to increases in traffic on minor roads and through villages such as Kennington and Radley. Careful consideration of access and routeing as well as impacts on the local communities (congestion, noise and air) would be required at the site selection stage as well as at the planning application stage to facilitate mitigation of adverse effects where applicable.

Some parts of the area identified in Radley present opportunities for use of water to transport materials as they can be accessed via the River Thames. If sites are taken forward in this area, moving materials via the river should be encouraged wherever possible; subject to consideration of environmental effects and costs.

The proposed areas are generally well located in terms of proximity to potential markets (except for areas to the north of the county). Moving materials by road would continue to contribute to green house gas (GHG) emissions having negative effects on climate change. Where potential for alternatives to road transport exist, these should be encouraged through policy or conditions to planning permissions.

Summary of principle underlying option 1: *Seeking to concentrate extraction in areas where working is currently taking place or has taken place recently has the economic advantages of using existing infrastructure as well as labour force. It also presents opportunities for co-ordinated large-scale restoration projects which would in the longer term lead to beneficial effects for the local communities (through recreation and leisure opportunities) as well as for wildlife. However, this option has potential to lead to cumulative negative effects on the local communities especially with regard to traffic and amenity issues. The long-term nature of mineral works means that communities within/close to the identified areas will continue to experience the effects of mineral working for the foreseeable future.*

Option 2 – This option identifies new areas where working would be concentrated, to replace existing areas of working. There are no nature conservation sites of international or national significance in any of the proposed areas. Some areas are constrained by the presence of SAMs (Clanfield/Bampton, Warborough and Dorchester). Here, mitigation measures against adverse effects might be required. Warborough, Cholsey and Dorchester also lie close to the AONB. The extent of actual areas available for working in these areas would be constrained by this designation.

Sutton/Stanton Harcourt is not affected by landscape or cultural heritage designations.

Opening up new areas for sand and gravel extraction could lead to adverse effects on access routes to be used to move materials. Working in Clanfield/Bampton would affect the A4095, B4020 and A417 depending on the exact sites chosen and is likely to require improvements in infrastructure to be deliverable. Working in WBS and CCD has potential to affect the A4074 while working in Sutton/Stanton Harcourt could affect the B4449; however, the A4074 is designated a local lorry route by the County Council. Further assessment on the suitability of these roads to handle increases in HGV movements should be provided in order to ascertain where there is likely to be adverse effects. Working in Cholsey has potential to use rail to move materials but if accessed by road there is potential for negative effects on the A4130 as well as on the A329 (depending on the sites selected).

With regard to proximity to markets, the proposed areas are generally well located (except for areas to the north of the county).

Working in the new areas could lead to some negative effects on the surrounding communities in terms of amenity (e.g visual, noise, traffic impacts) depending on location of sites and operation of works. However, these effects could be judged as being potentially less significant (subject to further detailed analysis on specific impacts) compared to option 1, due to the fact that option 1 could lead to cumulative negative effects on communities that have already experienced the impacts of mineral working for many years.

There would be some positive economic benefits in terms of providing employment in the new areas of working as well as in meeting Oxfordshire's sand and gravel needs.

Restoration following working would lead to beneficial effects for biodiversity as well as creating recreational opportunities for the local communities

Summary on principle underlying option 2: *Opening up new areas for working has the positive benefit of relieving communities that have experienced mineral working for long periods in the past therefore distributing the impacts of mineral working to other parts of the county. This option transfers impacts to other communities although these are judged to be less significant compared to option 1 due to the cumulative nature of option 1 effects. This option would require some extensions to some existing sites and so there would still be some cumulative effects in these areas although these would be for a shorter period, compared with the long-term nature of option 1 cumulative effects. Option 2 would lead to creation of new jobs in the identified areas but it would also require industry to re-locate or build new infrastructure and although this could lead to some negative economic effects in the short term, in the long term the economic benefits are judged to be positive.*

Option 3 – This option seeks to disperse mineral working to any areas of potential sand and gravel resource in the County and includes the areas covered by options 1 and 2 as well as Finmere, Faringdon and Caversham. As with option 1 and 2 above, the following issues would arise:

Nature conservation constraints – LWV (SSSI) and ECY (SSSI, SAC).

AONB constraints– Warborough, Cholsey and Dorchester.

SAMs constraints– all option 1 areas and Clanfield/Bampton, Warborough and Dorchester in option 2.

Transport impacts– LWV (A40, A415) and ECY (A40, A44), Sutton Courtenay (A34, A4130), Radley (A4074, but with potential for water based transport), Clanfield/Bampton (A4095, B4020, A417), WSB and CCD (A4074), Sutton/Stanton Harcourt (B449), Cholsey (A4130, A329 but area has potential for rail use) and Faringdon (A420).

Flood risk and ground water impacts - Some areas within LWV, ECY, Radley and Sutton Courtenay lie within flood risk zones 2 and 3. There is also potential for cumulative negative effects on ground water flow as a result of concentration of mineral workings within the LWV and the Cassington area.

As with the other options, this option would lead to some positive benefits associated with restoration as well as economic benefits through job creation and investment in new areas. However, it would also lead to some negative cumulative effects in areas within option 1 as discussed previously.

Distributing extraction has the advantage of reducing distances aggregates are moved by road thereby minimising emissions and local traffic impacts. However, there would still be some negative effects associated with moving materials by road.

Summary on principle underlying option 3: *Dispersing extraction has both positive and negative effects. Positive effects include potentially reducing the distances materials are moved, creation of new jobs, distributing of impacts around the county and offering restoration opportunities that could benefit communities in the longer term. The negative effects include the fact that more communities would be affected by the effects of mineral working (including some cumulatively as in option 1). This option has potential not to deliver large-scale restoration projects as works would be distributed in different parts of the county. The need for investment in new areas may impact negatively on industry e.g. moving infrastructure etc, but this is likely to be a short-term effect.*

2.2 Soft Sand

The soft sand option has been revised to now include an area of resource at Duns Tew in the north of the county. The area in the south west of the county has been reduced to two smaller areas located close the A420. When assessed against the SA objectives, both the identified areas (north and south of county) are close to SSSIs. The Tubney/Marcham/Hinton Waldrist area is also close to Cothill Fen SAC. Proximity to these sites may affect the extent of areas that can be worked and mitigation measures may be required to ensure there are no adverse effects on them.

None of the identified sites is close to AONB. However, mineral working has potential for adverse visual and landscape effects, and mitigation measures should be in place where sensitive receptors like housing may be affected leading to adverse visual effects. There are sites of archaeological value (SAMs) close to the Tubney/Marcham/Hinton Waldrist area. Working in this area would need to take account of the presence of the monuments and protect them accordingly.

It is not envisaged that soft sand working in both the identified areas to the north and south west would lead to significant increases in HGV traffic. However, there is still potential for some negative impacts from increased traffic on the local roads including

on the B4030/A260 (Duns Tew) and on the A420, A417, and B4508 (south west sites). Further assessment on access and suitability of roads to accommodate more HGV traffic is recommended at the site selection stage.

The revised option will have positive economic effects by providing local employment as well as meeting the county's soft sand needs. This option also allows the current pattern of extraction of two different quality sands to be continued which has a positive economic benefit.

Overall Summary on Principle underlying Soft sand option: *Identifying two areas of working in the south of the county and one in the north of the county will help minimise traffic impacts as well as spread the effects of soft sand working more equitably. However, there will be some cumulative effects on communities living close to existing sites and careful consideration should be given when identifying sites and allowing further extraction so as to minimise the overall effects of continued working in these areas. The two areas in the south west of the county have different quality sands and this option allows for the working of the two types of sand. Continuing with the existing pattern provides certainty to industry and also takes advantage of existing infrastructure.*

2.3 Crushed Rock

The revised option is made up of three areas based around existing limestone working areas. The option also includes reducing the area of search identified near Ardley quarry in the north of the County. The areas included in the option are:

- South of Burford area;
- East of River Cherwell, North of Bicester; and
- East/south east of Faringdon.

The SA findings indicate that some areas are constrained by the presence of SSSIs (Ardley and east of Faringdon near Tubney). There are no similar constraints in areas near Hatford and Burford. None of the areas identified are within AONB. However, there are SAMs in the area north of Bicester and close to the area east of Faringdon). Mitigation measures against adverse effects on these monuments as well as on local visual and landscape effects may be required prior to extraction of materials to avoid adverse effects.

As the identified areas are based around existing limestone working areas, if working continues at the current level, it is expected that there would be no increase in effects on air quality, traffic and on GHG emissions as traffic levels would be the same as current. However, a significant increase in working in any of the areas has potential for significant negative effects especially with regard to traffic. Careful consideration should be given to access and road capacities when considering sites for further working.

Continued working in the existing areas will result in cumulative effects over time on the local communities including on landscape and local amenity – noise, air, dust and traffic impacts. However, mitigation measures at the planning application stage can help reduce such impacts. It is also envisaged that there will be no significant increase in working in any particular area (based on the information provided by the County Council), and so no significant negative cumulative effects are expected.

Summary on principle underlying crushed rock option: *The revised crushed rock option would lead to a distribution of effects of crushed rock working in the county therefore potentially preventing adverse effects on a single locality. It also leads to a reduction in the area identified in the north of the county. This option takes advantage of existing infrastructure as well as continuing to provide local employment. This has positive economic benefits. In the long term, there is potential for negative cumulative effects on the communities living near the identified areas. Careful consideration should be given to the exact location of sites and works, relative to housing and other sensitive receptors to militate against potential negative effects.*

Appendix 1 Appraisal Matrices

Sand and Gravel Strategy Options				
Sustainability Appraisal Objectives	**Options**			**Summary and mitigation measures**
	Option 1- Concentrating on existing areas	**Option 2- Concentrating on new areas**	**Option 3 – Dispersed working**	
1. To protect, maintain and enhance Oxfordshire's biodiversity and geodiversity including natural habitats and protected species	+/- Proposed areas generally well located in terms of proximity to important nature conservation sites but some areas within Eynsham/Cassington/Yarnton)ECY)and Lower Windrush Valley (LWV) lie close to important nature conservation designations (SSSIs, SAC)	+ No potential adverse effects on SSSIs or SAC	+/- Proposed areas generally well located in terms of proximity to important nature conservation sites but some areas within ECY and LWV lie close to important nature conservation designations	Option 1 and 3 are somewhat constrained by the presence of important nature conservation designations in these areas. Development in the ECY area and the LWV would need to demonstrate that mitigation measures would be in place to avoid adverse effects to SSSIs and SAC. All options offer opportunities for biodiversity conservation through restoration although option 3, with a dispersed pattern of working, may offer less potential for landscape scale restoration.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	+/- There are no landscape designations in any of the areas proposed but there are Scheduled Ancient monuments (SAM) within each of the areas.	+/- SAMs are found within Clanfield Bampton, Warborough and Dorchester areas. Warborough, Cholsey and Dorchester also lie close to AONB. Stanton Harcourt is not affected by either landscape or archaeological designations.	+/- Some areas within this option (also included in options 1 and 2) are constrained by both landscape and archaeology.	Option 1 includes areas that are generally well located with regard to proximity to landscape and historic environment designations apart from proximity to SAMs in several of the areas; working in these areas would need to demonstrate that there are no adverse effects on the SAM. Option 2 - Proximity to the AONB for southern areas (Dorchester, Warborough and Cholsey) presents a constraint for sites in that area and proposals here would need to include mitigation measures to avoid adverse effects on the landscape. Option 3 –Areas within Option 3 that are constrained with regard to potential negative impacts on archaeology include (ECY, LWV, Radley, Sutton Courtenay, Clanfield / Bampton, Warborough, and Dorchester) while those constrained by AONB include Dorchester, Warborough, Cholsey and Caversham. Mitigation measures to avoid adverse effects on the identified designations would be required at the site selection and planning application stages.

Sand and Gravel Strategy Options				
Sustainability Appraisal Objectives	**Options**			**Summary and mitigation measures**
	Option 1- Concentrating on existing areas	**Option 2- Concentrating on new areas**	**Option 3 – Dispersed working**	
3. To maintain and improve ground and surface water quality	?/-	?/-	?/-	It is expected that mitigation measures would be required to protect water resources before planning permission is granted. The Environment Agency (EA) has expressed concern regarding significant increase in working in LWV as well as ECY due to potential in increase of low river flow issues and risk to nature conservation receptors within these areas.
4. To improve and maintain air quality to levels which do not damage natural systems	-	-	-	Movement of sand and gravel by road has potential for negative impacts on air quality. The significance of effect should be assessed at the planning application stage when details on access routes to sites and numbers of vehicle movements are available.
5. To reduce greenhouse gas emissions to reduce the cause of climate change	-	-	-	The Scoping report notes that present movements of aggregates in Oxfordshire are by road transport. Assuming all options will lead to continued use of road transport, this will contribute to continued GHG emissions associated with moving minerals by road
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	?/-	?/-	?/-	Some areas within LWV, ECY, Radley, Sutton Courtenay, Clanfield/ Bampton, WBS, Stanton Harcourt and Clifton Hampden lie within flood zones 2 and 3. Within these areas, the sequential test and where appropriate the exception tests will be required by the EA before sites are allocated.

Sand and Gravel Strategy Options				
Sustainability Appraisal Objectives	**Options**			**Summary and mitigation measures**
	Option 1- Concentrating on existing areas	**Option 2- Concentrating on new areas**	**Option 3 – Dispersed working**	
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	-- Continuing the existing level of working in LWV and ECY is unlikely to lead to increases in traffic levels along the A40 and similarly, working in Sutton Courtenay at current levels is unlikely to lead to increases in traffic on the A34. However, working in the Radley area has potential to lead to increases in HGV traffic on local roads.	- Working in Clanfield/Bampton could lead to increased traffic on the A4095, B4020 and A417 depending on the sites chosen. Infrastructure improvements are likely to be required to enable working in this area. The WBS area could result in traffic increases on the A4074, although this road is a designated lorry route, Working in Stanton Harcourt could impact negatively on the B449.	-- Similar to options 1 and 2	Moving aggregate minerals by road can have significant negative effects on the road network (depending on number of movements).Further working in areas of existing working (option 1) could have significant negative effects on the road network, however, the County Council would seek to ensure that working in these areas was at the same level as current works to mitigate against further increases in HGV traffic in these areas. Although option 2 has potential for some negative effects on the local roads, this is largely limited to the Clanfield/Bampton area. All options include sites that offer potential for use of sustainable transport e.g. Radley and Cholsey. This assessment is based on professional judgment, the baseline information presented in the scoping report and information on options being considered provided by the County Council. Detailed transport assessments are recommended at the site selection and planning application stage to ascertain number of additional or new HGV movements and their impacts on the road network.
	++ Some areas in Radley could be accessed via the River Thames	++ Potential for rail use in Cholsey	++ Potential for alternatives to road in Radley and Cholsey	
8. To minimise negative impacts of waste management facilities and mineral extraction on human health	0	0	0	Although the broad areas proposed include settlements and other sensitive receptors, it is expected such areas would not form sites for mineral extraction and that mineral working would not be in close proximity to sensitive human receptors. It is also expected that mitigation measures would be in place to off set potential negative health effects e.g. from dust and noise.

Sand and Gravel Strategy Options				
Sustainability Appraisal Objectives	**Options**			**Summary and mitigation measures**
	Option 1- Concentrating on existing areas	**Option 2- Concentrating on new areas**	**Option 3 – Dispersed working**	
9. To minimise the negative impacts of waste management facilities and mineral extraction on local amenity	--	-	--	Mineral extraction is likely to have some negative impacts on amenity including increase in HGV movements, noise and visual effects. Option 1 and 3 are judged as likely to have cumulative negative effects on communities living close to proposed areas where mineral extraction is already taking place or has taken place in the past.
10. To protect, improve and where necessary restore land and soil quality	++	+	+	Minerals working will be accompanied by proposals for restoration and in some cases e.g. in Option 1 restoration would contribute to the creation of large areas for wildlife conservation and improved recreational activities
11. To contribute towards moving up the waste hierarchy in Oxfordshire	0	0	0	
12. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	++	++	++	

Sand and Gravel Strategy Options				
Sustainability Appraisal Objectives	**Options**			**Summary and mitigation measures**
	Option 1- Concentrating on existing areas	**Option 2- Concentrating on new areas**	**Option 3 – Dispersed working**	
13. To promote efficient use of natural resources and avoid unnecessary sterilisation of mineral resources	++	++	++	
14. To support Oxfordshire's economic growth and reduce disparities across the county	++	++	++	

Summary of Principles underlying Options

Option 1: *Seeking to concentrate extraction in areas where working is currently taking place or has taken place recently has the economic advantages of using existing infrastructure as well as labour force. It also presents opportunities for co-ordinated large-scale restoration projects which would in the longer term lead to beneficial effects for the local communities (recreation and leisure) as well as for wildlife. However, this option has potential to lead to cumulative negative effects on the local communities especially with regard to traffic and amenity issues as well as on ground water and surface water flows. The long-term nature of mineral works means that communities within/close to the identified areas will continue to experience the effects of mineral working for the foreseeable future.*

Option 2: *Opening up new areas for working has the positive benefit of relieving communities that have experienced mineral working for long periods in the past therefore distributing the impacts of mineral working to other parts of the county. This option transfers impacts to other communities although these are judged to be less significant compared to option 1 due to the cumulative nature of option 1 effects. Option 2 would lead to creation of new jobs in the identified areas but it would also require industry to move or build new infrastructure and although this could lead to some negative economic effects in the short term, in the long term the economic benefits are likely to be positive.*

Option 3: *Dispersing extraction has both positive and negative effects. Positive effects include potentially reducing the distances materials are moved, creation of new jobs, distributing of impacts around the county and offering restoration opportunities that could benefit communities in the longer term. The negative effects include the fact that more communities would be affected by the effects of mineral working (including some cumulatively as in option 1). This option has potential not to deliver large-scale restoration projects as works would be distributed in different parts of the county. The need for investment in new areas may impact negatively on industry e.g. moving infrastructure etc, but this is likely to be a short-term effect.*

Soft Sand – Meet demand from south west of the county (near Faringdon) as well as from the north (Duns Tew)		
SA Objectives	Comments	
1. To protect, maintain and enhance Oxfordshire's biodiversity and geodiversity including natural habitats and protected species	- SSSIs close to or within all of the proposed areas	The presence of SSSIs will affect the extent of area that can be worked. Mitigation measures will be required where working is close to designated areas. Restoration of sites has the potential to result in creation of new habitats.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	0/-	None of the areas identified are within AONB. However, there are SMs close to the Tubney/Marcham/Hinton Waldrist area. Mitigation measures against adverse effects on these as well as on local visual and landscape effects would be required prior to extraction of materials to avoid adverse effects
3. To maintain and improve ground and surface water quality	?	Most soft sand working takes place above the water table and therefore there are minimal impacts on ground water flows.
4. To improve and maintain air quality to levels which do not damage natural systems	-/0	Working in both the north and the south west areas identified is unlikely to lead to significant increases in HGV traffic and therefore no adverse effects on air quality but there will still be some impacts associated with transportation of material
5. To reduce greenhouse gas emissions to reduce the cause of climate change	-/0	As above, working in both the north and south west areas identified is unlikely to lead to significant increases in GHG emissions as the increase in HGV vehicles is not expected to be high. However, there will still be some GHG emission as a result of road transportation
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	?	Most soft sand working areas lie outside flood risk zones 2 and 3. Where there is potential for flooding (e.g. small area in Hatfrod/Shellingford lies within flood risk zone 3), mitigation measures including the sequential test will be required before site allocation.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	-/0	As objective 4 and 5, the levels of traffic generated are not expected to be significant. However, there will be some impacts on the B4030/A260 (Duns Tew) and on the A420, A417, and B4508 (south west sites). Further assessment on access and suitability of roads to accommodate more HGV traffic is recommended at the site selection stage.
8. To minimise negative impacts of waste management facilities and mineral extraction on human health	0/-	Continuing working in both localities will lead to increased cumulative effects on the nearby communities although this can be reduced through mitigation measures at the planning application stage.

9. To minimise the negative impacts of waste management facilities and mineral extraction on local amenity	0/-	As above
10. To protect, improve and where necessary restore land and soil quality	+	Restoration of sites is likely to lead to improved land and soil quality
11. To contribute towards moving up the waste hierarchy in Oxfordshire	0	
12. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	++	
13. To promote efficient use of natural resources and avoid unnecessary sterilisation of mineral resources	++	
14. To support Oxfordshire's economic growth and reduce disparities across the county	++	

Summary – ***Soft sand option***: *Identifying two areas of working north and south of the county will help minimise traffic impacts as well as spread the effects of soft sand working more equitably. However, there will be some cumulative effects on communities living close to existing sites and careful consideration should be given when identifying sites and allowing further extraction so as to minimise the overall effects of continued working in these areas. The two areas have different quality sands and this option allows for the working of the two types of sand. Continuing with the existing pattern provides certainty to industry and also takes advantage of existing infrastructure.*

Crushed Rock –Crushed rock areas include south of Burford, East of River Cherwell, north of Bicester and east/south east of Faringdon

SA Objectives	Comments	
1. To protect, maintain and enhance Oxfordshire's biodiversity and geodiversity including natural habitats and protected species	-/+	Some areas are constrained by the presence of SSSIs (Ardley and east of Faringdon near Tubney). There are no similar constraints in areas near Hatford and Burford. Restoration has potential to create opportunities for biodiversity.
2. Protect and enhance landscape character, local distinctiveness and historic and built heritage	0/-	None of the areas identified are within AONB, although the Burford area is in close proximity to the setting of the Cotswolds AONB. However, there are SAMs in the area north of Bicester and close to the area identified east of Faringdon). Mitigation measures against adverse effects on these as well as on local visual and landscape effects would be required prior to extraction of materials to avoid adverse effects
3. To maintain and improve ground and surface water quality	?	Impacts on ground water will be tested at the planning application stage

4. To improve and maintain air quality to levels which do not damage natural systems	0/-	If working continues at the current level, impacts on air quality will remain as current but increases in production could lead to negative effects on air quality due to increased traffic
5. To reduce greenhouse gas emissions to reduce the cause of climate change	0/-	As above – increased traffic would lead to increase GHG emissions
6. To mitigate Oxfordshire's vulnerability to flooding, taking account of climate change	0	None of the proposed areas lies within areas of high flood risk.
7. To minimise the impact of transportation of aggregates and waste products on the local and strategic road network	0/-	If working continues at the current level (identified areas are existing limestone working areas), transport impacts will remain as current. However, increased working in any one particular area has potential for negative cumulative effects on the road network and communities near the area
8. To minimise negative impacts of waste management facilities and mineral extraction on human health	-	Continued working in the existing areas will result in cumulative effects over time on the local communities although mitigation measures at the planning application stage can help reduce such impacts and it is envisaged that there will be no significant increase in working in any particular area.
9. To minimise the negative impacts of waste management facilities and mineral extraction on local amenity	-	
10. To protect, improve and where necessary restore land and soil quality	+	Restoration is likely to result in improved land and soil quality where appropriate
11. To contribute towards moving up the waste hierarchy in Oxfordshire	0	
12. To enable Oxfordshire to be self sufficient in its waste management and to make a sustainable contribution to its sub-regional minerals apportionment	++	
13. To promote efficient use of natural resources and avoid unnecessary sterilisation of mineral resources	++	
14. To support Oxfordshire's economic growth and reduce disparities across the county	++	

Summary on principle underlying crushed rock option: *The revised crushed rock option would lead to a distribution of effects of crushed rock working in the county therefore potentially preventing adverse effects on a single locality. It also leads to a reduction in the area identified in the north of the county. This option takes advantage of existing infrastructure as well as continuing to provide local employment. This has positive economic benefits. In the long term, there is potential for negative cumulative effects on the communities living near the identified areas. Careful consideration should be given to the exact location of sites and works, relative to housing and other sensitive receptors to militate against potential negative effects.*