

MINERALS AND WASTE PLAN WORKING GROUP - 27 September 2010

**Paper MW1
Minerals and Waste Core Strategy
Assessment of Minerals Spatial Strategy Options**

1 Context

- 1.1 The Minerals and Waste Development Framework will set out how minerals will be supplied and waste managed in the county. The framework will consist of a Minerals and Waste Core Strategy and site specific documents for minerals and waste.
- 1.2 The Core Strategy will include a vision and strategic objectives, a spatial strategy, core policies; and a monitoring and implementation framework.
- 1.3 Work on the minerals element of the framework is being taken forward in advance of that on waste. The initial work is focused on agreeing the preferred spatial strategy for minerals. Detailed site allocations will be considered as a follow on piece of work, informed by an assessment of need. Such an approach enables consideration of individual sites to be undertaken within an agreed strategy but in response to changing demand. In this way the release of sites for exploitation can be aligned more closely with economic activity across the County.
- 1.4 Aggregate minerals are required to supply the construction materials needed both for new development and for repair and renewal of existing development. The supply of these minerals in Oxfordshire consists of locally won aggregates (sand and gravel, soft sand and crushed rock), crushed rock imported by rail and road, and secondary and recycled aggregates. Locally extracted aggregates reduce the need to transport materials long distances.

2 Guiding Principles

- 2.1 The principles that will underpin the minerals element of the overall framework are:
 - a) Ensure the supply of locally won sand and gravel, soft sand, crushed rock and secondary and recycled aggregates supports economic activity;
 - b) Ensure the supply of minerals is economically efficient whilst minimising the environmental impact;
 - c) Maximise the use of secondary and recycled aggregates in place of primary aggregates, and safeguard facilities for their production;

- d) Minimise the distance minerals are transported by road and encourage the movement of aggregates by conveyor, rail and water, and safeguard facilities for moving aggregates by rail or water;
 - e) Secure high quality restoration of mineral workings to nature conservation, agriculture, or other appropriate use, and increase biodiversity and habitat creation and provision for local access and recreational use;
 - f) Protect areas or sites of landscape, ecological, geological and heritage importance from adverse impacts;
 - g) Minimise the adverse impact of mineral extraction and transportation on local communities, and secure local benefits through mineral working and restoration;
 - h) Prevent the unnecessary sterilisation of Oxfordshire's sand and gravel, soft sand, crushed rock and fuller's earth resources by other forms of development.
- 2.2 In addition the framework will reflect the spatial priorities for growth in Oxfordshire. The Oxfordshire Local Investment Plan (2010-2030) identifies the main locations for housing and employment growth as being Bicester, Oxford and the Science Vale area which includes Didcot, Wantage and Grove. These locations account for the majority of growth across Oxfordshire and will therefore generate the greatest demand for aggregates. This is also the part of the county where there will be the greatest concentration of demand from repair and renewal of existing development.
- 2.3 Applying the guiding principles to this spatial strategy will be critical to minimising the adverse impact of mineral workings, and in particular will help reduce the impact on the transport system.
- 2.4 In addition the framework must take into account known movements of aggregates across the county boundary, particularly the movement of soft sand into the Swindon area and sand and gravel from Caversham into the Reading area.

3 Current Pattern of Mineral Working

- 3.1 Over the last 10 to 15 years, sharp sand and gravel working has been focussed on Sutton Courtenay, Sutton Wick, Stanton Harcourt (Lower Windrush Valley) and Eynsham/Cassington/Yarnton. A decline in reserves in the Sutton Courtenay, Sutton Wick and Radley areas to the south of Oxford has led to an increased concentration of working in West Oxfordshire, in the Lower Windrush Valley and Eynsham / Cassington / Yarnton areas.

- 3.2 Soft sand working is concentrated in a corridor between Oxford and Faringdon, with some working in the north of the county at Duns Tew, reflecting where this resource is found.
- 3.3 Limestone aggregate quarries are mainly worked in the north of the county outwith the Cotswolds Area of Outstanding Natural Beauty, to the south of Burford and at Ardley. There is also some limestone working in association with soft sand extraction in the south west of the county, where higher quality, harder stone is found. Ironstone is worked in the area north west of Banbury.

4 Spatial Strategy: Developing the Options

- 4.1 Using British Geological Survey maps, eighteen sand and gravel resource areas, one soft sand resource area and three limestone resource areas were initially identified for potential inclusion within a spatial strategy.
- 4.2 As there are significant reserves of ironstone already available with planning permission, no additional sites are required for the foreseeable future.

Initial Options: February 2010

- 4.3 Three options were set out for sand and gravel extraction:
 - a) To concentrate working centrally in the county, with three sub-options: north and west of Oxford; south and east of Oxford; and a combination of these options;
 - b) To disperse working to resource areas close to markets; and
 - c) To phase extraction, moving from extensions to existing sites in the short term to new working areas in the longer term.
- 4.4 For soft sand, a single option involved one extensive resource area in the south west of the county.
- 4.5 For crushed rock, a single option involved limestone extraction from three areas, based on existing workings.
- 4.6 A summary of the consultation responses to these options is at Appendix 1.

Revised Options: July 2010

- 4.7 As a result of the initial consultation, a revised set of options were produced for consultation in July 2010. A summary of the consultation responses is at Appendix 2.

- 4.8 Diagrams showing the revised options are at Appendix 3. The revised set of options for sand and gravel are:
- a) Concentrate mineral extraction in four existing areas of working: Lower Windrush Valley; Eynsham / Cassington / Yarnton; Radley; and Sutton Courtenay;
 - b) Concentrate mineral working in some or all of the following new areas, moving away from existing areas of working during the plan period: Clanfield / Bampton; Sutton / Stanton Harcourt; Clifton Hampden / Wittenham; Benson / Shillingford / Warborough; and Cholsey;
 - c) Disperse working across the resource areas, including all the existing and new areas as well as 3 other existing areas of working: Finmere; Faringdon; and Caversham.
- 4.9 The revised option for soft sand includes three more tightly defined areas: around Duns Tew; south east of Faringdon; and the Tubney / Marcham / Hinton Waldrist area.
- 4.10 The revised option for crushed rock is based on three areas of existing working: north of Bicester to the east of the River Cherwell; south of the A40 near Burford; and south east of Faringdon (associated with soft sand extraction).

5 Assessment of Options

- 5.1 A framework, based on Policy M2 of the Oxfordshire Structure Plan (2016)¹, has been used to assess the implications of each option. The assessment criteria are:
- a. Proximity to markets;
 - b. Accessibility to the main transport routes;
 - c. Risk of birdstrike;
 - d. Restoration and after use potential, especially habitat creation and public access;
 - e. Archaeological remains and historic buildings;
 - f. Areas and sites of nature conservation importance, especially Special Areas of Conservation and Sites of Special Scientific Interest;
 - g. Features of landscape importance, especially Areas of Outstanding Natural Beauty;
 - h. Best and most versatile agricultural land;
 - i. Water environment: flooding; surface and water ground water flows;
 - j. Impact on local communities and the local economy;

¹ This is a 'saved' policy and these criteria reflect issues identified in Minerals Policy Statement 1: Planning and Minerals (November 2006)

k. Safety and convenience of road users.

5.2 Stakeholders' views on these criteria were sought and their responses are summarised in Appendix 4. Annexes A – G provide an assessment of each option against each of the criteria. In addition a sustainability appraisal of the options has been carried out by consultants.

6 Testing the Options

- 6.1 The South East Plan was revoked in July 2010. The guidance accompanying the government's letter of revocation states that planning authorities in the South East should work from the apportionment (the level of supply provision to be planned for) set out in the "Proposed Changes" to the revision of South East Plan Policy M3, published on 19 March 2010. The Proposed Changes set a figure of 2.1 million tonnes a year of sand and gravel for Oxfordshire. The guidance goes on to say that Mineral Planning Authorities can choose to use alternative figures if they have new or different information and a robust evidence base.
- 6.2 The County Council opposed the figure of 2.1 million tonnes a year. A locally derived assessment of the quantity of sand and gravel that provision needs to be made for is being undertaken and will be used to inform the identification of detailed site allocations.
- 6.3 For the purposes of current considerations, the key issue is whether the level of minerals provision required has fundamental implications for the spatial strategy. In other words, does the level of provision needed invalidate any of the options under consideration?
- 6.4 The figures in Appendix 5 show that all options are capable of accommodating any of the supply provision scenarios considered to date. Sites nominated by operators are a good indication of commercial deliverability.
- 6.5 As a consequence the identification of a preferred spatial strategy can be policy led.

7 Additional Commentary on Sharp Sand and Gravel Options

7.1 Option 1

- The Radley area is close to Oxford; it has poor access to the west of the River Thames but could be accessed from the A4074 (a local lorry route) to the east of the river.
- There are limited sand and gravel resources remaining in the Sutton Courtenay area, and it could only make a strategic contribution to supply for a limited part of the plan period.
- The Lower Windrush Valley and the Eynsham/Cassington/Yarnton areas have plentiful resources and good access via the A40 to north Oxford and to Bicester, but are further from south Oxford, Didcot

and Wantage and Grove. There has been a cumulative impact of mineral working and transportation on local communities, landscape and lorry traffic levels in these two areas. Oxford Meadows Special Area of Conservation poses a potential constraint to working the southern part of the Eynsham/Cassington/Yarnton area.

7.2 Option 2

- The Clanfield/Bampton area is poorly located relative to markets for aggregates and would require big improvements to infrastructure to enable large scale working without impacting on villages and local roads.
- The Sutton/Stanton Harcourt area has good access to the A40 via the Eynsham bypass. But working in this area could increase the cumulative impact of working in West Oxfordshire and on the A40.
- The Clifton Hampden part of the Clifton Hampden/Wittenham area is accessible by local lorry route (A415 and A4074) and has few environmental constraints, although there are some Scheduled Ancient Monuments (SAMs) and lorries would have to pass through Clifton Hampden and Burcot. An extensive SAM, the nearby Little Wittenham SAC and the adjoining North Wessex Downs AONB are major constraints on the Wittenham part of the area.
- The southern part of the Warborough/Benson/Shillingford area is constrained by the presence of SAMs and Grade 1 agricultural land, but the northern part has few environmental constraints and could be linked to the A4074 near Berinsfield.
- The Cholsey area has good access to the local lorry network and is near to Didcot. The proximity of the Chilterns and North Wessex Downs AONBs could constrain mineral working in parts of this area.

7.3 Option 3

A dispersal strategy would not encourage effective and economic use of resources, would be likely to increase mineral miles and would not enable objectives for restoration and local benefits to be achieved effectively.

7.4 A revised approach could draw upon some elements of all three options to create a hybrid option which reduces mineral miles, spreads the burden of mineral working and supplies the aggregates markets from areas both to the west and south of Oxford.

7.5 An example of such a hybrid option might involve: continuing working in the Lower Windrush Valley and Eynsham / Cassington / Yarnton areas (with a possible move to Sutton/Stanton Harcourt in the long term), which could supply the northern part of the county, including Oxford and Bicester; limited further working at Sutton Courtenay and phased development of new areas at Cholsey, Clifton Hampden, Radley (northern part) and Warborough / Shillingford / Benson (northern part) implemented through the plan period, which could supply the southern part of the county, including Oxford and Didcot; and a continuation of

working in the Caversham area, to supply south east Oxfordshire and the Reading area.

8 Next Steps

- 8.1 A report on the assessment of minerals spatial strategy options and seeking approval for a preferred minerals strategy for public consultation will be made to Cabinet on 19 October 2010. This item is due to be considered by the Growth and Infrastructure Committee on 6 October.
- 8.2 Subject to the decision of Cabinet, public consultation will be carried out on the preferred minerals strategy, commencing in November. This will be a further and important stage of consultation in the preparation of the Minerals and Waste Core Strategy, leading to the proposed submission draft of the plan which we are aiming to produce by the end of 2011 for independent examination in 2012.
- 8.3 The views of the Minerals and Waste Plan Working Group on the minerals spatial strategy options and the assessment work carried out, as set out in this paper, are invited.

Lois Partridge / Peter Day
20 September 2010

Appendix 1: Responses to February/March 2010 Consultation

Some general themes of the responses were:

The options were not thought to be sufficiently distinct. Some options included the same areas as other options; this was particularly the case for the sand and gravel phased option (option 3).

The areas covered by some options were thought to be too extensive and included areas thought unlikely to be economically viable to work or are constrained by national environmental designations.

Stakeholders expressed concerns about the sand and gravel concentration strategy, particularly potential transport impacts, impacts on local communities and environment, and local acceptability.

Sand and Gravel Strategy Option 1a – concentration of sand and gravel working to the west / north west of Oxford:

- a) The Environment Agency expressed concern about concentrating mineral extraction in this area, as it could have hydrological impacts particularly on the Lower Windrush Valley, where low river flow is a concern.
- b) The Highways Agency was concerned that a concentration strategy in this area could result in a potential increase in trip generation which could increase congestion at the Peartree junction on the A34.
- c) Natural England was concerned that this option included part of Oxford Meadows SAC and other SSSIs.
- d) The biodiversity group recognised that concentrating development in this area could offer the greatest opportunities for landscape scale restoration and to create joined up areas for nature conservation.
- e) Oxford Airport noted that birdstrike could potentially be a problem for aircraft, should this option be brought forward for mineral development.
- f) Parish Councils noted the cumulative impact of working on local communities and the lack of flexibility that the concentration strategy offered.

Sand and Gravel Strategy Option 1b – concentration of sand and gravel working to the south / south east of Oxford:

- a) OCC transport officers noted issues of accessibility of some of this area to the strategic road network. The Highways Agency noted that this option could lead to an increase in mineral miles and that the impacts of mineral traffic on Marcham junction of the A34 would need to be assessed.
- b) Natural England expressed concern that this option includes Little Wittenham SAC and is in close proximity to Cothill Fen SAC. The setting of the North Wessex Downs AONB also needs to be taken into account.
- c) There are a number of archaeologically significant sites in this area which may pose a potential constraint to mineral extraction.

- d) The biodiversity group recognised that concentrating development in this area could offer opportunities for landscape scale restoration and to create joined up areas for nature conservation.

Sand and Gravel Strategy Option 1c – concentration of sand and gravel working in both the areas identified in Options 1a and 1b:

- a) The same issues were identified as in Options 1a and 1b, but stakeholders recognised that the concentration would be less intense in either area.

Sand and Gravel Strategy Option 2 – dispersal of sand and gravel working across resource areas which are close to markets:

- a) A truly dispersed option would encompass all potentially available resources and not be limited to areas close to markets.
- b) Some stakeholders thought this option would lead to many communities being affected by the impacts of mineral extraction. Some also thought that any decrease in current impact on communities caused by a dispersal strategy was unlikely to be in proportion to the principle of dispersal.
- c) Operators recognised the benefits of dispersing working to reduce impacts on any one area but thought that a dispersal strategy would give fewer opportunities for developer funding of highway and amenity and biodiversity improvements.
- d) The Environment Agency and the Highways Agency expressed a preference for a dispersed strategy to reduce the potential impacts of mineral working in any one area.
- e) The dispersal option was not favoured by the biodiversity group as it reduces the potential for landscape scale restoration from sites.

Sand and Gravel Strategy Option 3 – a phased approach with continued sand and gravel working from extensions to existing areas of working during the plan period and identification and planning of a new area or areas of working for beyond the plan period:

- a) Stakeholders commented that the strategy should only address the need for minerals during the plan period, not beyond it, and that in any case the issue of longer term provision is common to all options. But the minerals industry favoured long term planning for new sites.
- b) Stakeholders thought there was too much overlap with options 1b and 1c, with currently unworked resource areas to the south east of Oxford being included in both (and also in option 2).
- c) The Environment Agency preferred this option because it would enable strategic planning for ecologically viable habitat restoration and would reduce the concentrated impact of extraction on any one area.
- d) The Highways Agency expressed concern that this option still includes the area north and west of Oxford and therefore their concerns about the impacts of working in this area on the strategic road network remain.

Soft Sand Strategy Option – mineral working within a single extensive area in the south west of the county:

- a) The technical consultees had no major concerns about this option.
- b) Stakeholders noted that the area identified was very extensive and suggested that it could be made smaller.
- c) Stakeholders noted that the option did not take into account the soft sand resource in the North of the county.
- d) Stakeholders voiced concerns about the ability of local roads to cope with minerals lorries.

Crushed Rock Strategy Option – mineral working within three areas: an extensive area between Bicester and Chipping Norton: the Burford area; and the soft sand strategy option area in the south west of the county:

- a) The technical consultees had no major concerns about this option other than the Highways Agency, which voiced concern about the potential impact of this option on the Peartree junction on the A34.
- b) Stakeholders noted that the area between Bicester and Chipping Norton was very extensive and suggested that it could be reduced in size, taking into account the location of workable resources.

Appendix 2: Responses to July Consultation

A summary of the consultation responses to the revised options from the stakeholder workshops held in July 2010 is provided below. The main themes from these responses were:

Sand and gravel option 1- continue working in existing areas:

- This option would take advantage of existing infrastructure and existing working arrangements
- The option would result in continued and cumulative impact of mineral working on some local communities
- Caversham should have been included in this option
- The option could result in many applications for extensions to existing sites, which could result in the use of long conveyors to move material back to plant for processing.

Sand and gravel option 2-new areas of working:

- Relief for communities currently experiencing working
- New workings may be more efficient than old workings
- This option is likely to result in need for new and improved infrastructure and therefore represents an inefficient use of existing infrastructure
- This option represents a higher risk to deliverability than the existing sites option
- This option may lead to an increase in mineral miles between working and markets
- Concern that there are many bridges over the River Thames in the new areas which are not capable of carrying mineral lorries and many roads which are not suitable for HGV traffic.
- Some of the new areas have extensive archaeological remains within them
- Many of the new areas are in close proximity to airfields, raising concerns about safeguarding to prevent birdstrike.

Sand and gravel option 3- dispersed pattern of working:

- This option would lead to disadvantages of scale; small operations with few opportunities to seek funding from operators for infrastructure improvements or high quality restoration
- This option could lead to an increase in the number of sites for OCC to manage and monitor effectively
- Lack of focus for infrastructure developments or planning
- Will increase the number of areas affected by 'planning blight'

Soft sand option:

- Common sense approach, based on existing areas of activity
- Good transport links except in Marcham and Newbridge
- Issue of archaeology at Marcham/Frilford
- Potential issue of cumulative impact of development in this area if the reservoir goes ahead.

Crushed Rock option:

- Advantages of basing the strategy on existing sites recognised, eg infrastructure in place
- Advantages of combining soft sand and crushed rock extraction on the same sites recognised.
- Ardley; transport issues around Bicester and ancient woodland NW of Bicester

In addition to the feedback received from the stakeholder workshops, separate responses were also received from PAGE, AGGROW, CPRE, Nuneham Courtenay parish council and 240 individuals. Where appropriate, information from these responses has been incorporated into the assessment tables.

Mineral operators' responses to July consultation

The revised options were discussed at a meeting with mineral operators in July. Overall, the operators prefer a dispersed option which they note offers more flexibility and enables working to be located closer to markets. A summary of their responses is below.

a) General comments on all options

The market is not constrained by county boundaries and there are some cross boundary movements of aggregates. This is especially the case when aggregates have been processed to make value-added products, which increases their value and the economic viability of them travelling longer distances.

The number and location of new areas proposed needs to consider the spatial picture of neighbouring counties and the associated impacts on supply in relation to any existing and/or future minerals operations close to Oxfordshire's county borders.

b) Crushed Rock option

It may be preferable to have a mixture of both small and large facilities to make provision for crushed rock, and also to maintain an adequate provision of building stone for the historic built environment, over the plan period.

c) Sand and gravel option 1- existing areas of working

Concern was expressed that if option 1 concentrates development in a few, large sites, the strategy will be dependent on few operators.

It is more difficult to maintain supply from large production units because a large permitted reserve needs to be maintained.

It was also noted that there could potentially be difficulty in delivering sites within a concentration strategy, in the face of well organised, significant local opposition.

It was suggested that concentrating working around Oxford may not necessarily be the most efficient strategy to supply the market, as the Oxfordshire market is much more than just Oxford.

d) Sand and gravel option 2- new areas of working

It was suggested that greater clarity is needed on the aims of this option to make it clear that existing sites will effectively be shut down when permissions expire and that new areas would be phased in.

There was broad support for this option in so far as it would move production closer to the demand centres. However, it was pointed out that more of the areas featured in this option lie further away from the primary road network and that access must be one of the most important criteria by which the options are assessed.

Option 2 was generally thought not to be deliverable in the shorter term. Operators also thought that concentration on new areas should focus on what is deliverable in the plan period, not beyond.

e) Sand and gravel Option 3- dispersal option

Option 3 was considered to be more favourable than Option 2. A dispersed approach would allow a mix of existing and new working areas; it would relate well to markets; and it could be delivered within the required timescale.

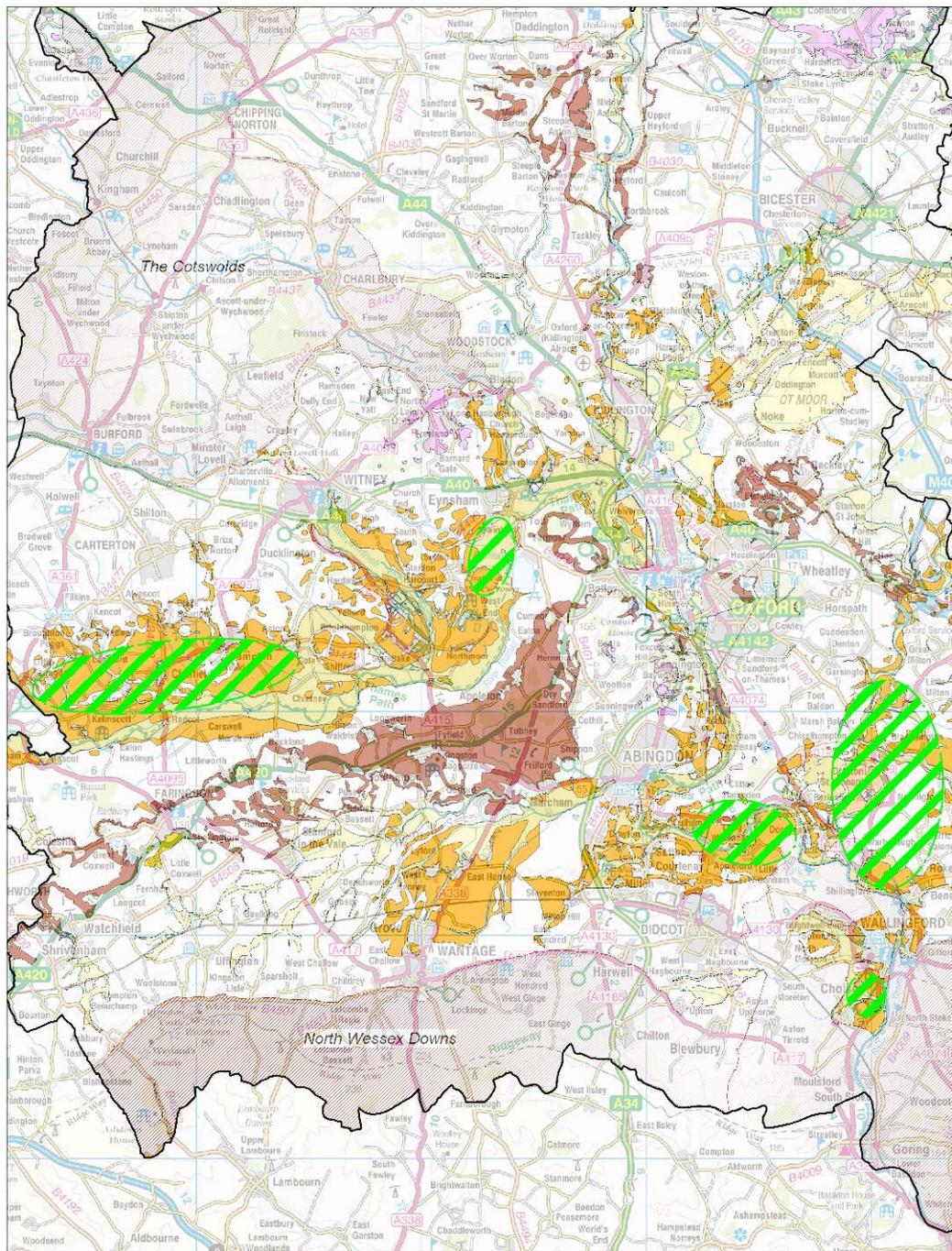
There are advantages of concentrating working in a large number of small areas. It was noted that local communities often prefer the development of small sites, which will only have a life of a few years. However, the operators recognised the difficulty of ensuring that such sites do not subsequently apply for extensions, thereby extending their period of working and undermining the local community's goodwill towards them.

Land ownership issues can also make larger sites more difficult to deliver than smaller sites.

But operators noted that both options 2 and 3 could result in planning blight on several areas of the county, with continued uncertainty as to when mineral development may take place in those areas.

Sand and gravel option 2

Option 2; concentration on new areas July 2010

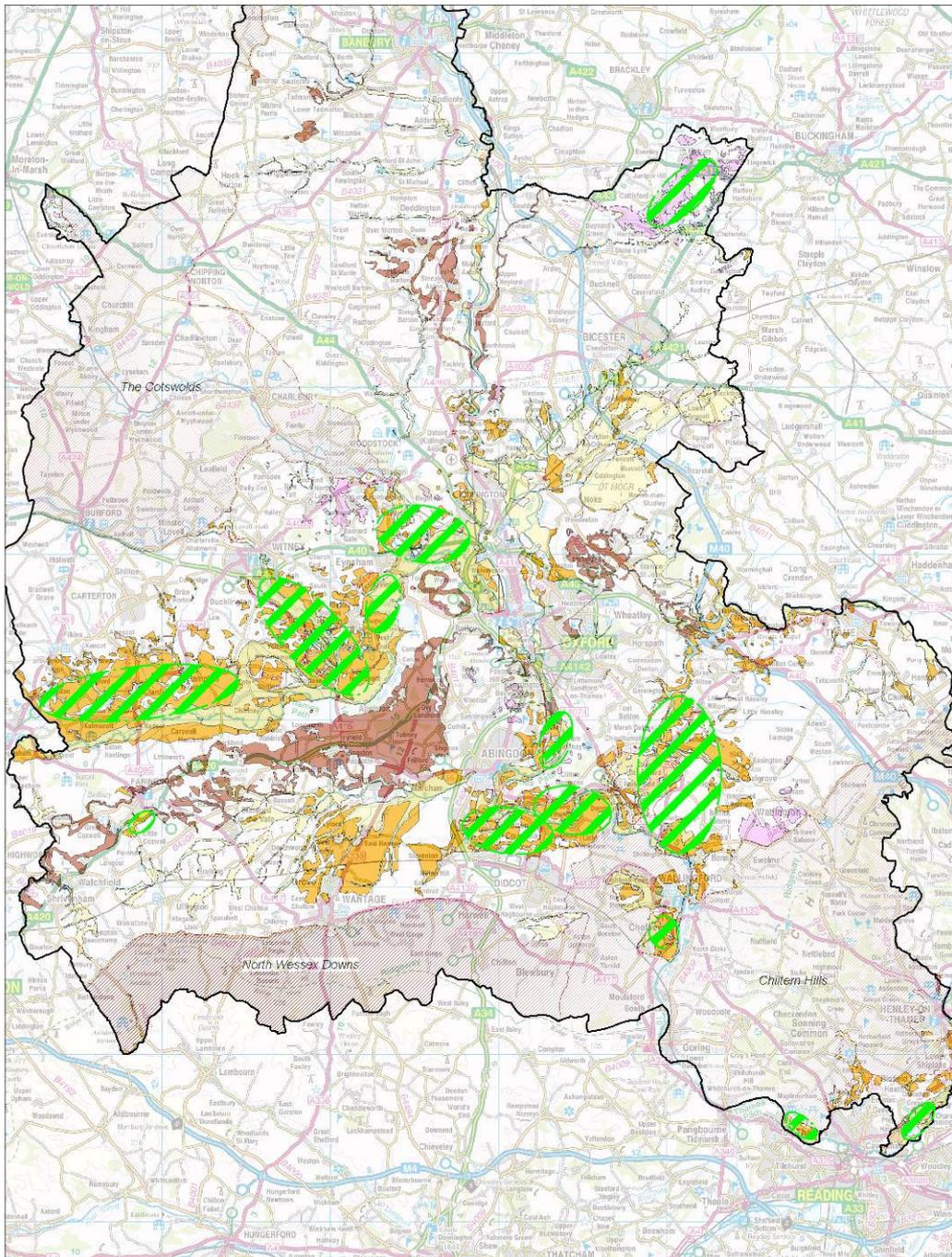


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Sand and gravel option 3

Option 3: dispersed option July 2010

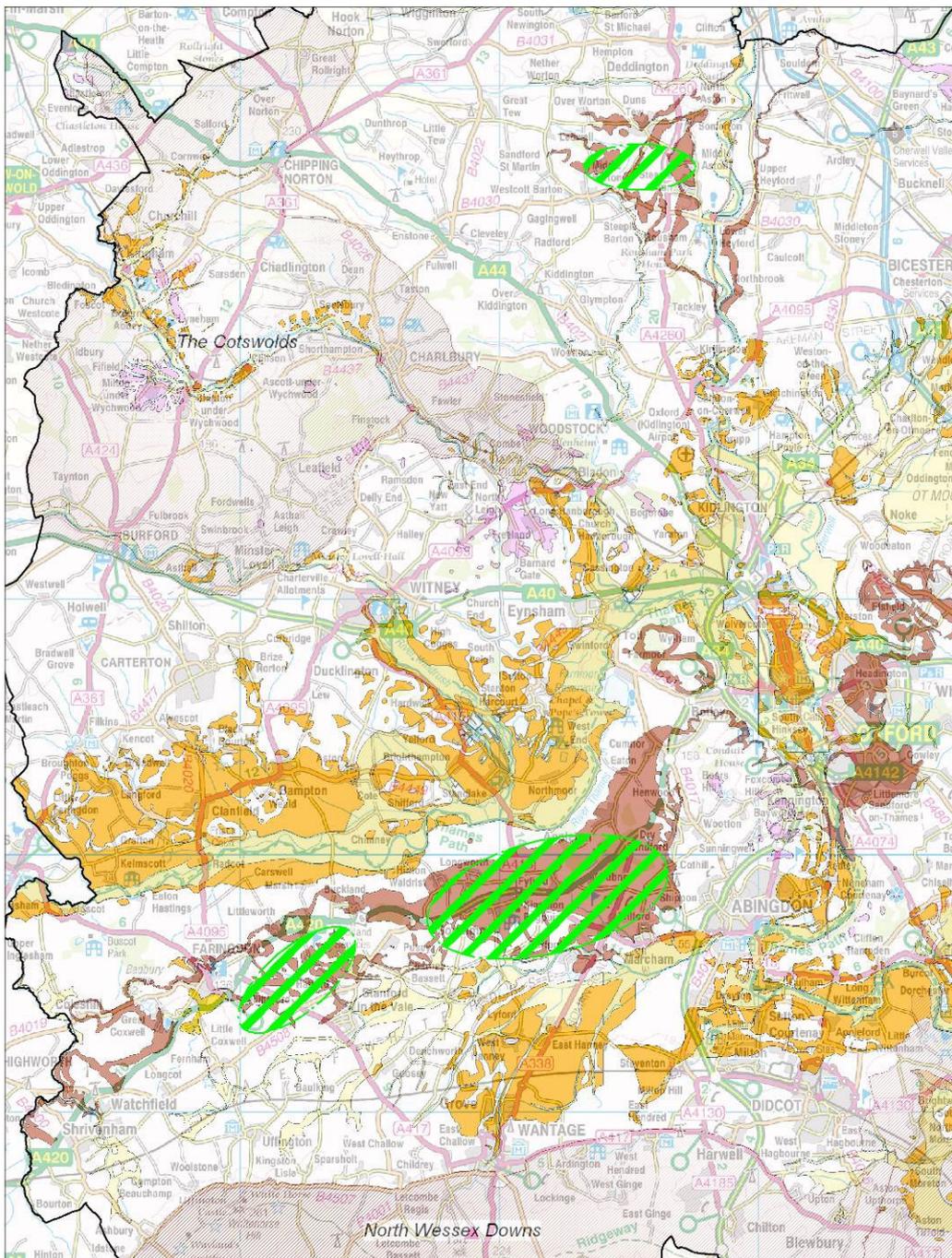


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Soft sand option

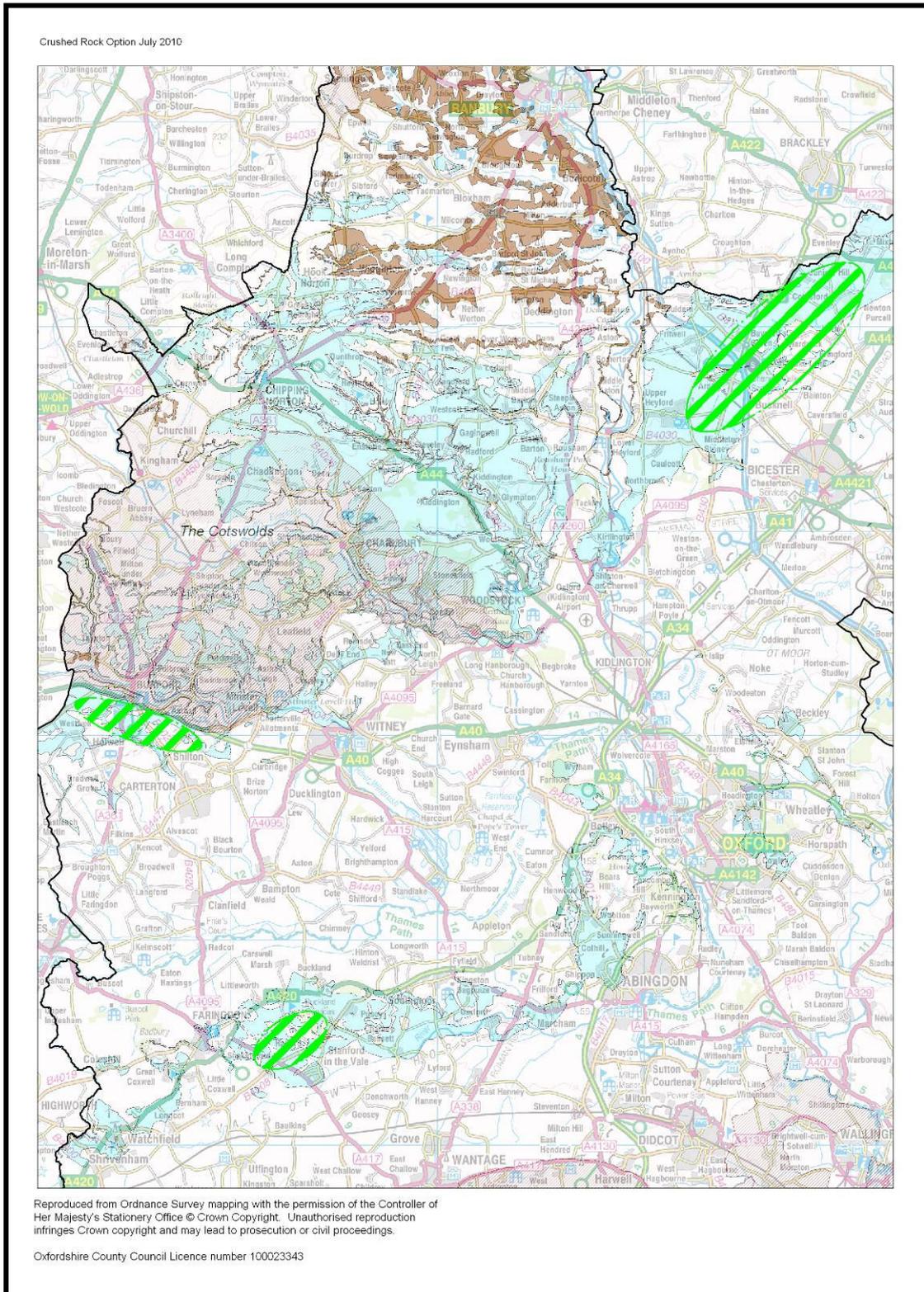
Soft sand option July 2010



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Crushed rock option



Appendix 4: Responses to Consultation on Proposed Criteria, July 2010

<i>Stakeholders were asked 'Do you agree with the use of these criteria for the assessment of the options?'</i>	
Comment made	Recommendation
The use of geological maps and classification of agricultural land are standard assessment criteria and should therefore be investigated further	BGS mapping will be used to assess the quality and depth of deposits, as far as available data allows. Natural England provides comments on the options and best and most versatile agricultural land.
'Proximity to market'; the assessment needs to clarify which locations make up the market.	This will be fully described and justified in the assessment paper. Need to clarify that 'the market' refers to major towns in Oxfordshire.
The list was too simplistic	No constructive alternatives offered.
The criteria are good but need to be applied locally	The criteria will be applied to each of the areas within the options, which will enable an assessment to take place at a local level.
Restoration and after use should take into consideration their long term impacts on local communities	This is assessed under the criterion 'impact on communities and local economy'
Sites of nature conservation should not only cover the designated site, but the area near to the site	The designation of sites for nature conservation should ensure consideration of mineral working close to SACs and SSSIs.
Some of the criteria could be made more area specific, eg bird strike at Brize Norton	The criteria will be used to assess all the option areas to enable a comparison to be made between them, so they cannot be specific to one locality.
'Proximity to roads' should take into consideration only those roads that can take lorries	To enable a comprehensive assessment to take place, the options will be assessed according to their accessibility to major roads.
All criteria are important	It is agreed that all criteria are important. However, some criteria such as sites designated for environmental importance eg SACs may prevent working.
Proximity to markets should include climate impacts	Climate impacts are considered through the assessment of proximity to markets. The sustainability appraisal also considers accessibility of options to markets, likely mineral miles travelled and associated emissions of greenhouse gases.
Suitable transport routes – needs to take into consideration the context of roads and trucks involved	The assessment of options by transport officers and the Highways Agency have contributed to this assessment.
Sites of nature conservation should also include broader list of such areas including the Thames PPS 9 conservation areas.	This possibly refers to Conservation Target Areas. These are being considered in terms of impact on areas of biodiversity importance within them and in

	the context of restoration and afteruse potential criterion.
One group identified suitable transport routes, implications for local residents and road safety issues as being the most important.	All three are covered by the criteria.
Bird strike should also take into consideration the broader area including training grounds.	The Defence Estates response identifies broad areas of the county within the mineral option areas which need to be considered because of their proximity (within 8 miles) of a number of MOD bases. As far as we are aware, there are no training grounds in Oxfordshire, with the exception of Otmoor.
<i>Are there other criteria which should also be considered?</i>	
Clarity should be made about whether the supply of minerals is just for use within Oxfordshire	This is covered by the criteria 'proximity to markets', which focus on markets within Oxfordshire.
Should consider density and quality of the minerals deposit	This will be considered as an issue in the assessment of deliverability of the options.
Impact on tourism	The impact of tourism and on local business could be included in the criterion 'impact on communities and local economy'.
Proximity to rail network for out of county exports	Of little relevance due to distance of most options from rail network and evidence base which shows that most aggregate is imported into the county, not exported from it. Sand and gravel and Oxfordshire rock travel limited distances to market and markets are dispersed; rail is only good for large scale, long distance movement from one point location to another.
Transport to final destination	This will be considered as part of the assessment of the options against the 'proximity to markets' criterion.
Effect on existing businesses	This will be included in the criterion 'impact on communities and local economy'
Enforcement of planning conditions	It would not be practical to include this as a criterion for assessing options for future working.
Planning gains for local communities	This could be included as a positive criterion under 'impact on residents' and comes under the 'restoration and afteruse' criterion.
Accessibility of proposed sites	This will be considered under the 'accessibility to the main transport routes' criterion.
Wildlife proximity	Options are assessed against sites designated for their environmental significance. Conservation target Areas

	also provide a potential positive impact on wildlife.
Detailed hydrological assessments (before extraction)	At this strategic level, it is not appropriate to carry out detailed hydrological assessments. The SFRA sets out the appropriate level of detail for the Core Strategy.
Impact on local businesses	As above
Impact on tourism	As above
Water Framework Directive	The requirements of the WFD are covered by the Environment Agency's response to the consultation.
Biodiversity and landscape amenity impacts	These are considered under the criteria which assesses the options against 'sites designated for their environmental importance' and 'sites designated for their landscape importance.'
Impact on wells in the surrounding area including degradation following dewatering process	This issue cannot be considered at this strategic level but it may be appropriate to address this when specific sites are being considered for inclusion in a Sites Development Plan Document.
Control/policing of agreed transport routes	It is not practical to include this as a criterion for assessing options for future working.
<i>Other comments</i>	
What about creating buffer zones around working?	This is a site specific implementation issue, for consideration at planning application stage, or possibly in Sites DPD, but not appropriate to strategic level assessment.
Can more be done to obtain funding for necessary improvements to roads?	This relates to the criterion 'accessibility to major roads' and an assessment of whether funding would be available to improve road infrastructure.
Communities may be prepared to accept quarries, but they do not want the sites to become waste facilities after use.	The after use of quarries and their potential for restoration is considered by the assessment.
When evaluating road impacts this should cover the whole route including proper traffic flow assessments and potential should include identification of needs for specific road improvements	Transport officers are providing a comprehensive assessment of the options and the impact of working in these areas on the road network.

Appendix 5: Testing the Options against a Range of Supply Figures

A nineteen year period is used; this covers the period from the end 2008 (when data was last published on permitted reserves) to 2027, which provides a 15 year period from the expected adoption of the Core Strategy in 2012.

SHARP SAND AND GRAVEL	Average 5 year figure (0.956 mtpa) x 19 years = 18.15 million tonnes	Average 10 year figure (1.23 mtpa) x 19 years = 23.37 million tonnes	SEERA figure (1.311 mtpa) x 19 years = 24.91 million tonnes	CLG recommended figure (2.1mtpa) x 19 years = 39.9 million tonnes
Sand and gravel option 1				
- Permitted reserves	5,687,000	5,687,000	5,687,000	5,687,000
- Estimated yield of nominations	33, 291,000	33, 291,000	33, 291,000	33,291
TOTAL	38,978,000	38,978,000	38,978,000	38,978,000
Sand and gravel option 2				
- Permitted reserves	5,687,000	5,687,000	5,687,000	5,687,000
- Estimated yield of nominations	58,690,000	58,690,000	58,690,000	58,690,000
TOTAL	64,377,000	64,377,000	64,377,000	64,377,000
Sand and gravel option 3				
- Permitted reserves	5,687,000	5,687,000	5,687,000	5,687,000
- Estimated yield of nominations	96,681,000	96,681,000	96,681,000	96,681,000
TOTAL	102,368,000	102,368,000	102,368,000	102,368,000

SOFT SAND	Average 5 year figure (0.196 mtpa) x 19 years = 3.71 million tonnes	Average 10 year figure (0.209 mtpa) x 19 years = 3.97 million tonnes	SEERA figure (0.223 mtpa) x 19 years = 4.23 million tonnes
Soft sand option			
- Permitted reserves	1,231,000	1,231,000	1,231,000
- Estimated yield of nominations	10,900,000	10,900,000	10,900,000
TOTAL	12, 131,000	12, 131,000	12, 131,000

CRUSHED ROCK	0.66mtpa x 19 years = 12.54 million tonnes
Crushed rock option	
- Permitted reserves	12,592,000 tonnes
- Estimated yield of nominations	17,210,000 tonnes
TOTAL	29,802,000 tonnes

