

**Bedfordshire County Council and Luton
Borough Council Minerals Development
Framework**

**Sustainability Appraisal of the Issues and
Options**

*ENVIRON UK Limited
Swallow Court, Devonshire Gate,
Tiverton, Devon , EX16 7EJ
Tel: 01884 842 010*

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<i>Author (signature):</i>	<i>Emma James</i>
<i>Project Manager/Director (signature):</i>	<i>Johanna Curran</i>
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1.0 INTRODUCTION

1.1 BACKGROUND TO THE ISSUES AND OPTIONS CONSULTATION PAPER

Bedfordshire County Council and Luton Borough Council have produced a “Minerals Development Plans Issues and Options Consultation Paper” for their Minerals Development Framework Process in February 2006. This consists of two parts. The first part sets out policy issues, which will be used to inform the Core Strategy Development Plan Document. These issues relate to the overall scale and nature of future minerals supply in Bedfordshire and Luton. Each issue is accompanied by a series of potential policy options. These policy options, where applicable, have been subject to a sustainability appraisal which is reported in Section 3.0 of this report. The second part of the Issues and Options Consultation Paper sets out a portfolio of potential new sites for mineral extraction. These sites have been nominated by minerals operators and landowners in the County. These sites have also been subject to a sustainability appraisal which is reported in Section 4.0 of this report. A cumulative assessment has also been undertaken to assess the potential cumulative effects of clusters of sites. This is reported in Section 5.0 of this report

Some initial consultation-led sustainability appraisal work was carried out on the issues and options report. This consisted of appraisal tables for a limited number of the issues, options and sites which were filled in by stakeholders at a consultation workshop. Three public stakeholder workshops were also held at which appraisal tables were filled in which addressed clusters of sites. The results of these consultation meetings were reported in an issues and options consultation report. This report can be accessed at the following web address: <http://www.environmentcommunication.co.uk/MWDF-SA.htm>.

Although this process did yield a considerable amount of information and gave stakeholders an opportunity to get involved at an early stage it was felt by Bedfordshire County Council and Luton Borough Council that it would be useful for decision making purposes at this stage to undertake a more detailed and rigorous assessment to address each applicable site and every issue. This opinion was reinforced at the issues and options consultation stage as GO-East asserted that in order to support the ongoing consultation process it would be helpful to produce sustainability commentaries on the issues and options. The purpose of this report is to provide the sustainability commentary to guide the ongoing consultation and planning process.

1.2 THE SUSTAINABILITY APPRAISAL PROCESS

As ODPM guidance outlines, during the issues and options stage the effects of the strategic options must be assessed in broad terms. The aim of this assessment is to assist in the selection of the

preferred options. Once the preferred options have been selected they will be assessed in more detail. This broad issues and options assessment has been applied to:

- The issues and options outlined in the report;
- the individual sites; and
- site clusters in order to determine cumulative effects of each cluster.

The methodology used for the assessment is described in Section 2.0.

2.0 METHODOLOGY OF THE APPRAISAL

2.1 SCOPING THE KEY SUSTAINABILITY ISSUES

An SA scoping report of the Bedfordshire and Luton Minerals Core Strategy and Site Allocations DPD was produced in November 2005 to help ensure that the SA process covered the key sustainability issues for minerals planning in Bedfordshire and Luton. This scoping report can be accessed at the following web address: <http://www.environcommunication.co.uk/MWDF-SA.htm>

This scoping report set out two SA frameworks, through which the sustainability effects of the plan could be assessed. The first framework was designed to address the sustainability issues associated with minerals issues, options and policies. The second framework was designed to address the sustainability issues associated with site allocations. This sites framework is a simplified version of the issues, options and policies SA framework and focuses more on the direct effects a site can have on environmental and sustainability criteria. These SA frameworks are shown in Table 1a and Table 1b.

Table 1a: SA framework for the assessment of issues, options and policies

SEA Topic	SA Objectives	SA Questions. Does the plan...
Biodiversity, flora and fauna	<ul style="list-style-type: none"> To protect and where appropriate enhance sites designated for their ecological value. To protect and enhance the wider biodiversity of the County. Maximise potential biodiversity value of existing minerals sites. Ensure restoration to biodiversity end use for mineral sites and contributes to realising local and national BAP targets. 	<ul style="list-style-type: none"> Include actions that directly or indirectly affect Natura 2000 sites, SSSIs or other designated sites? Include actions that will cause habitat loss or fragmentation? Include actions that help to reach targets or compromise targets of BAPs? Include actions to ensure restoration to biodiversity is a priority where appropriate?
Cultural heritage	<ul style="list-style-type: none"> To protect and where appropriate enhance sites of archaeological and cultural interest. To protect archaeological remains. Improve opportunities for education and interpretation of archaeological remains where appropriate. 	<ul style="list-style-type: none"> Include actions that could impact upon remains, sites and monuments valued for their cultural heritage? Include actions to improve education and interpretation of archaeological remains?
Landscape	<ul style="list-style-type: none"> To protect and where appropriate enhance sites designated for their landscape value. Avoid damage to valued features of landscape and avoid incremental and cumulative impacts on sensitive landscapes. Enhance landscape through restoration. 	<ul style="list-style-type: none"> Cause changes to designated areas which threatens the reason for their designation? Cause changes to the landscape / that (in themselves or cumulatively with other proposals) are completely at variance with the character of the area? Change the number of people that are affected by the visual impact of minerals development? Include actions which will enhance

SEA Topic	SA Objectives	SA Questions. Does the plan...
		<p>landscape through restoration?</p> <ul style="list-style-type: none"> • Change the amount of accessible greenspace available?
Land use	<ul style="list-style-type: none"> • Integrate with development plans. 	<ul style="list-style-type: none"> • To what extent does the plan help achieve the objectives of the wider development framework?
Air quality and noise	<ul style="list-style-type: none"> • Safeguard air quality and reduce the number of people affected by noise from minerals development. 	<ul style="list-style-type: none"> • Change the amount of pollution caused by mineral working? • Encourage suitable mitigation measures?
Human health, population and social inclusion	<ul style="list-style-type: none"> • Reduce the impact of the minerals industry on people's health and quality of life. 	<ul style="list-style-type: none"> • Cause a change in the number of people directly affected by mineral working (living in close proximity to a mineral site or an access route) whose impact cannot be mitigated? • Cause a cumulative impact on certain communities (either through permitting more reserves affecting the same community or by lengthening the time period of permission)?
Economic growth – minerals and material assets	<ul style="list-style-type: none"> • Ensure a sustainable contribution is made to the sub regional aggregate apportionment. 	<ul style="list-style-type: none"> • Help ensure that a sustainable contribution is made to the sub regional aggregate apportionment?
Water	<ul style="list-style-type: none"> • To maintain and enhance water resources and quality. • Improve flood management and risk. 	<ul style="list-style-type: none"> • Include actions that could increase / reduce the risk of effects on groundwater and surface water quality and quantity? • Include measures that could increase / decrease the potential for flooding?
Transport	<ul style="list-style-type: none"> • Reduce the mileage travelled by minerals. • Reduce nuisance caused to communities by minerals transport. • Encourage a modal shift away from road freight. 	<ul style="list-style-type: none"> • Cause a change in traffic flows or the nature of traffic (an increase in HGVs for example) that affects communities or areas valued for their environmental importance? • Include actions to help to protect important distribution network nodes (e.g. rail facilities). • Include actions that would encourage a shift from road freight to rail freight? • Include actions that change mileage travelled per tonne?
Waste	<ul style="list-style-type: none"> • Reduce waste produced from minerals development. • Increase the proportion of secondary and recycled aggregates produced. 	<ul style="list-style-type: none"> • Change the amount of waste produced per tonne of mineral? • Include actions that change the mix of aggregates produced between primary materials and secondary / recycled materials?
Climate change	<ul style="list-style-type: none"> • Reduce the distance that minerals are transported. 	<ul style="list-style-type: none"> • Reduce the distance that minerals are transported?
Soils and geology	<ul style="list-style-type: none"> • Protect and where appropriate enhance geodiversity. • Protect mineral reserves from sterilisation. 	<ul style="list-style-type: none"> • Include actions that improve or remove geodiversity? • Include actions that help to protect mineral reserves (i.e. through the imposition of Mineral Consultation Areas or Mineral Safeguarding Areas).

SEA Topic	SA Objectives	SA Questions. Does the plan...
Employment and education	<ul style="list-style-type: none"> Support employment in the minerals industry. 	<ul style="list-style-type: none"> Include actions that change the number of people directly employed in the minerals industry?

Table 1b: SA Framework for the assessment of sites

Topic	Objective	SA Questions. Does the plan...
Biodiversity and earth science	<ul style="list-style-type: none"> Create habitat and improved site biodiversity. Protect designated (e.g. SSSIs) and non-designated sites of importance. 	<ul style="list-style-type: none"> To what extent are land based resource blocks constrained by designated areas e.g. National Nature Reserves, SSSIs, and SACs etc.? To what extent does the proposed site threaten the qualities of designated areas?
Archaeology and cultural heritage	<ul style="list-style-type: none"> Protect designated and non-designated sites of importance. 	<ul style="list-style-type: none"> To what extent are land based resource blocks constrained by designated sites or Conservation Areas? To what extent does the proposed site threaten the qualities of designated areas?
Landscape	<ul style="list-style-type: none"> Protect designated and non-designated areas of landscape, or other amenity value. Consider alternatives to mineral extraction in resource areas of high landscape value. Maintain and enhance access and enjoyment. 	<ul style="list-style-type: none"> To what extent are land based resource blocks constrained by designated areas e.g. National Parks etc.? To what extent does the proposed site threaten the qualities of designated areas?
Land take ¹	<ul style="list-style-type: none"> Minimise area of land take per tonne of aggregate produced. Ensure minerals development helps to achieve the objectives of the wider development framework. 	<ul style="list-style-type: none"> To what extent do land based resource blocks conflict with areas of best and most versatile agricultural land? To what extent do land based resource blocks help achieve the objectives of the wider development framework (i.e. contribution to amenity, landscape, biodiversity objectives through restoration).
Human health and amenity	<ul style="list-style-type: none"> Maintain or enhance quality of life for residents. Consider proximity of mineral workings to settlements. Minimise nuisance from minerals workings and HGV movements. 	<ul style="list-style-type: none"> To what extent do land based resource blocks conflict with current or planned residential areas? What level of nuisance or cumulative effect on quality of life or human health is likely to occur as a result of the proposed site?
Transportation	<ul style="list-style-type: none"> Encourage best use of available transport mode options for aggregate supply. Protect distribution network nodes, especially those for more preferred modes of transport (wharves, railheads, etc). 	<ul style="list-style-type: none"> Which mode of transport (rail, road or water) is most likely to be used in the transportation of the aggregate? Is the site near to the strategic highway network?
Extent of remaining	<ul style="list-style-type: none"> Promote practices which protect remaining proven landbank and conserve 	<ul style="list-style-type: none"> To what extent does the proposed site minimise impacts on existing landbanks?

¹ The question regarding level of ability to restore sites that was included in the scoping report has been removed due to the difficulty of assessing this issue at the strategic level.

Topic	Objective	SA Questions. Does the plan...
landbank	primary aggregate resources. <ul style="list-style-type: none"> • Protect sites used for mineral working. • Prevention of resource sterilisation. 	i.e. contribute to landbanks through reserves.
Conservation and protection of resources	<ul style="list-style-type: none"> • Minimise the use of resources, such as water, energy etc., in the production of aggregates. • Minimise the impact upon resources, such as water bodies, through the provision of aggregates. 	<ul style="list-style-type: none"> • To what extent are resources used or impacted upon for the extraction of the aggregate?
Waste management	<ul style="list-style-type: none"> • Minimise the amount of waste produced per tonne of aggregate. 	<ul style="list-style-type: none"> • How much waste is likely to be produced per tonne of aggregate?
Other planning considerations	<ul style="list-style-type: none"> • Avoid permitting workings, especially sand and gravel extraction, within the buffer area around airports as suggested by the CAA Guidance CAP680 (13km radius). • Consider all other planning constraints in an objective and unprejudiced manner. 	<ul style="list-style-type: none"> • To what extent are resource blocks affected by other constraints e.g. CAA Guidance CAP680?

2.2 IDENTIFICATION AND ASSESSMENT OF POTENTIAL SUSTAINABILITY ISSUES

Matrices have been used to identify the sustainability effects of the issues, options and sites. These matrices are designed to help identify the potential impacts of the plan on each SA topic (guided by the SA Questions). A matrix has been designed for the appraisal of the issues and options and one has been designed for the appraisal of sites. The matrix for the assessment of the issues and options is a relatively simple matrix. It allows for a discussion and comparison of each of the options. A summary of the issues raised during consultation is also provided which provides additional information and has been used to guide the assessment team in their deliberations. The simplicity of the matrix is designed to reflect the fact that strategic options should (and in many cases can only be, due a lack of spatial expression) be assessed in broad terms. An illustration of the matrix used to assess issues and options is shown in Table 2a.

Table 2a: Matrix used to assess issues and options

Issue 1: Time period of plan coverage	Comparison of options
SA Questions. Does the plan...	The comparison of the options illustrates the relative merits of the individual options and at this stage does not infer that any of the options will be chosen to be the final preferred option.
Issues raised during consultation:	
Archaeology and cultural heritage	

<ul style="list-style-type: none"> • Include actions that could impact upon remains, sites and monuments valued for their cultural heritage? • Include actions to improve education and interpretation of archaeological remains? 	
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The matrix for the assessment of the sites is more detailed in recognition of the fact that more detailed information is available on which to base a fuller assessment. In addition, it is anticipated that by undertaking a more detailed assessment of sites at this stage it will save Bedfordshire County Council and Luton Borough Council time at the preferred options stage. The matrix provides for a summary of the impact to include information on nature and spatial extent of the impact, probability, duration, frequency and reversibility. Space is also provided which can be used to record the significance of the effect over the following timescales.

- Short term during site development;
- medium term during site working; and
- long term after final site restoration.

An illustration of the matrix used to assess sites is shown in Table 2b. Significance criteria for each SA issue have been devised to give more certainty to the scoring of the assessment. These are shown in Table 3.

Table 2b: Matrix used to assess sites

Site: MD1, Land off New Road, San				
SA Objective	Summary of impact (including nature and spatial extent of the impact, probability, duration, frequency and reversibility).	Significance of the effect		
		Short	Medium	Long
Archaeology and cultural heritage				
<p>To what extent are land based resource blocks constrained by designated sites or Conservation Areas?</p> <p>To what extent does the proposed site threaten the qualities of designated areas?</p>				

Table 3: Significance criteria for the assessment of sites

SA Objective	Potential positive effects ++ (green)	Likely to give rise to minor (positive or negative) impacts and with mitigation is likely to give rise to no change / minor positive minor² + / 0 / - (orange)	Potential negative effects³ -- (red)
Biodiversity and earth science			
To what extent are land based resource blocks constrained by designated areas e.g. National Nature Reserves, SSSIs, and SACs etc.? To what extent does the proposed site threaten the qualities of designated areas?	Will result in habitat creation and will contribute to the wider network of ecological habitats and biodiversity within the area. Will protect and enhance the quality and extent of natural priority habitats (as shown by the habitat opportunity areas mapping project).		Loss or irreparable damage to designated sites. Will hinder the development of habitat opportunity areas.
Archaeology and cultural heritage			
To what extent are land based resource blocks constrained by designated sites or Conservation Areas? To what extent does the proposed site threaten the qualities of designated areas?	Supports restoration or contributes to the character of an existing heritage area.		Loss or irreparable damage to designated sites.
Landscape			
To what extent are land based resource blocks constrained by designated areas e.g. National Parks etc.?). To what extent does the proposed site threaten the qualities of designated areas?	Significant improvements to existing landscape resulting in both on and off site landscape benefits.		Be at odds with the key characteristics of the relevant landscape type.
Land take			
To what extent do land based resource blocks conflict with areas of best and most versatile agricultural land?	Resource mainly lies within land classified as 4, 5 or unclassified.		Resource mainly lies within land classified as 1, 2 and 3a.
To what extent do land based resource blocks help achieve the	Site will help to achieve the objectives		Site will hinder the objectives of the wider

² Commentary will only note nature of impact and will not identify mitigation at this stage.

³ Please note that the red shading does not mean that sites should not be taken further in the planning process. It means that but that there are potentially significant issues which need mitigation before development can go ahead.

objectives of the wider development framework (i.e. contribution to amenity, landscape, biodiversity objectives through restoration).	of the wider development framework.		development framework.
Human health and amenity			
What level of nuisance or effect on quality of life or human health (for both existing or planned residential areas) is likely to occur as a result of the proposed site?	Improvements to current or future quality of life for existing / future local residents.		An increase in nuisance and decrease in current or future quality of life for existing / future local residents.
Transportation			
Which mode of transport (rail, road or water) is most likely to be used in the transportation of the aggregate? Is the site near to the strategic highway network?	Decrease in amount of aggregate moved on local roads near to centres of population.		Increase in amount of aggregate moved on local roads near to centres of population.
Extent of remaining landbank			
To what extent does the proposed site minimise impacts on existing landbanks? i.e. contribute to landbanks through reserves (<i>this may be an issue related to silica sand only</i>)	Contributes to an identified need for specific minerals which have a limited landbank.		Does not deliver minerals which have been identified as being required to maintain the landbank.
Conservation and protection of water resources			
To what extent are water resources used or impacted upon for the extraction of the aggregate?	Extraction will not lead to discharge into sensitive watercourses.		Site poses risk of pollution to sensitive watercourses which would need to be addressed through mitigation.
Waste management			
How much waste is likely to be produced per tonne of aggregate? (<i>this may be an issue related to silica sand only</i>)	Site will give rise to the most efficient extraction of mineral resources resulting in a minimal amount of waste per tonne of aggregate.		Site will give rise to an unacceptable proportion of waste per tonne of aggregate.
Other planning considerations			
To what extent are resource blocks affected by other constraints e.g. CAA restrictions re Guidance CAP680?	Site is not affected by other constraints (i.e. CAA restrictions).		Site is affected by other constraints (i.e. CAA restrictions).

A combination of expert judgement, analysis of baseline data and analysis of consultation responses has been used to judge the effects of the issues, options and the sites. In addition, GIS constraints data was made available by Bedfordshire County Council for each site and each site cluster. This GIS data consisted of the following:

- Sites of Special Scientific Interest, National Nature Reserves and County Wildlife Sites;
- Areas of Great Landscape Value, Green Belt, Common Land and Areas of Outstanding Natural Beauty;
- Sites of Archaeological Interest, Ancient Monuments and Historic Parks and Gardens;
- extant waste and mineral permissions, old mineral sites, and mineral consultation areas;
- public footpaths, public bridleways, bridleways open to all traffic, national cycle network and strategic highway network;
- floodplain, Internal Drainage Board Area;
- Airport safeguarding zone, bird strike zones, schools; and
- Areas of Best and Most Versatile Agricultural Land.

No zero plan scenario has been developed as part of the issues and options development. However, this has been taken into account as each issue, option and site is assessed against the current social, environmental and economic characteristics of the area which is subject to the DPD and the likely future situation without a DPD based on the trends in the baseline identified in the Scoping Report (future baseline).

At the preferred options stage further consideration will be given to the development of a zero plan scenario. It is sensible to do this at the preferred options stage because it is the effect of the plan as a whole that is being assessed.

2.3 ASSESSMENT OF THE POTENTIAL CUMULATIVE EFFECTS OF SITE CLUSTERS

Clusters 1 to 4 (see Figure 1) have been assessed for the cumulative effects on sustainability issues. Cluster 5 has not been assessed as it does not represent a coherent spatial cluster. The assessment of the cumulative effects of the site clusters was carried out in 3 phases:

- Collation of the sustainability assessments of the individual mineral sites for each of the four identified clusters;
- assessment of GIS data and maps for each cluster; and
- based upon the above 2 phases, an assessment of the potential overall positive and negative cumulative impacts of each of the four cluster groupings.



Figure 1: Location of the site clusters

For clarity and consistency each cluster assessment has been broken down into the following ten topic areas which have previously been used for the assessment of the individual sites:

- Biodiversity and earth science;
- archaeology and cultural heritage;
- landscape;
- land take;
- human health and amenity;
- transportation;
- extent of remaining landbank;
- conservation and protection of water resources;
- waste management; and
- other planning considerations.

The same key to significance used for the site assessments has been used for the site clusters.

3.0 RESULTS OF THE ISSUES AND OPTIONS ASSESSMENT

3.1 INTRODUCTION

The Issues and Options Consultation Paper puts forward eleven issues, all of which have a number of options attached to them. Not all issues and options have been fully assessed using the matrix. This is due to the fact that many of the options are not detailed enough to be able to undertake a coherent assessment. However, at the preferred options stage all policies and proposals will be subject to SA. The following options have not been assessed as part of this process (see Table 4).

Table 4: Issues not subject to appraisal

Issue	Summary of options	Justification for not appraising
Issue 3: Aggregates recycling	<ul style="list-style-type: none"> Should aggregates recycling in terms of making policies and provisions for new facilities, be addressed in the Minerals Core Strategy and Site Allocations Plan; or Waste Core Strategy and Site Allocations Plan. 	It is considered at this time that a sustainability commentary would not add anything to the planning process as this is mainly a procedural issue and would not cause significant sustainability effects.
Issue 5: Other minerals:	<ul style="list-style-type: none"> Are the assumptions regarding brick clay, fuller's earth and chalk correct (that there are sufficient permissions) or should specific provision be made for these classes of minerals? Is it necessary and appropriate to identify the site at Pavenham? Should the minerals core strategy include a specific policy related to brickworks and should specific sites be proposed? 	It is considered at this stage that a sustainability commentary would not add anything as the effects of the option are not assessable at this stage due to the level of detail needed to make a meaningful assessment. If a specific policy is provided on brickworks and sites selected later in the planning process, these will be appraised at that stage.
Issue 7: Other policies:	<ul style="list-style-type: none"> Should policies M5 (rationalisation of reserves), M6 (requirements for mineral applications), M7 (import of materials for processing), M8 (borrow pits) and M9 (rail aggregate depots) be bought forward without significant modification? 	It is considered at this time that a sustainability commentary would not add anything to the planning process as this is mainly a procedural issue and would not cause significant sustainability effects.
Issue 8: Mineral Consultation Areas:	<ul style="list-style-type: none"> Should Mineral Consultation Areas be refined to give more focused coverage? 	It is considered at this time that a sustainability commentary would not add anything to the planning process as this is mainly a procedural issue and would not cause significant sustainability effects.
Issue 9: Reservoirs:	<ul style="list-style-type: none"> Should a policy on reservoirs be included in the plan? If this policy is necessary should this be addressed by expanding the policy on borrow pits? 	It is considered at this time that a sustainability commentary would not add anything to the planning process as this is mainly a procedural issue and would not cause significant sustainability effects.
Issue 10: Other Matters:	<ul style="list-style-type: none"> Should the core strategy include a policy encouraging mineral operators to maintain and environmental management system? Are there any other matters not covered 	It is considered at this stage that a sustainability commentary would not add anything as the effects of the option are not assessable at this stage due to the level of detail needed to make a meaningful

Issue	Summary of options	Justification for not appraising
	by existing policy that are worth considering?	assessment.
Issue 11: Market Monitoring:	<ul style="list-style-type: none"> Should the core strategy include a policy for all new consents to include a condition requiring mandatory annual reporting of sales? 	It is considered at this stage that a sustainable assessment would not add anything as the effects of the options are not assessable at this stage due to the level of detail required to make a meaningful assessment.

Four issues have options that are detailed enough to allow an assessment at this strategic level. These are shown in Table 5. The assessment matrices for these issues are shown in Appendix 1.

Table 5: Sites which have been assessed

Issue	Summary of options
Issue 1: Time period of plan coverage	<ul style="list-style-type: none"> Should the end date of the core strategy be 2018, 2021 or some other date?
Issue 2: Aims and objectives of the plan	<p>Two alternative aims have been suggested:</p> <ul style="list-style-type: none"> To make appropriate provisions for the supply of minerals in Bedfordshire and Luton in accordance with national and regional policy and in the most sustainable manner that can be achieved, taking into account the <i>Sustainable Communities</i> growth agenda; or To make appropriate provisions for the supply of minerals in Bedfordshire and Luton in accordance with national and regional policy, whilst protecting so far as possible, and where possible enhancing, the environment. <p>The following objectives have been suggested:</p> <ul style="list-style-type: none"> To identify appropriate landbanks for aggregates and industrial sands including, where necessary and achievable, separate landbanks for subdivisions of these mineral classes. To make appropriate provisions, where necessary, for the working of other mineral types in the plan area. To specify preferred sites for the supply of identified mineral needs and to ensure that these sites represent the most sustainable options. To conserve mineral resources by protecting them from sterilisation, encouraging their prudent use, and specifying appropriate phasing mechanisms for their release. To minimise adverse environmental impacts of mineral working and associated transport of minerals, and to make use of opportunities to improve the environment and make other sustainability gains. To ensure the appropriate restoration and after-use of mineral workings, taking particular account of biodiversity and public amenity needs.
Issue 4: Landbank for aggregates and industrial sands	<ul style="list-style-type: none"> Eleven options have been suggested in total from a single landbank, through to landbanks split on the basis of: <ul style="list-style-type: none"> Landbanks calculated using 2003 sales and split between concreting/building aggregate with Woburn & Quaternary sources for concreting aggregate; B1) Landbanks calculated using apportionment with 50/50 split between concreting/building aggregate and with 18:82 split between Woburn & Quaternary concreting aggregate sources (as per 2003 sales); B2) Landbanks calculated using apportionment with 70/30 split between concreting/building aggregate and with 18:82 split between Woburn & Quaternary concreting aggregate sources (as per 2003 sales); B3) Landbanks calculated using apportionment with 71/29 split between concreting/building aggregate and with 18:82 split between Woburn & Quaternary concreting aggregate sources (both as per 2003 sales);

Issue	Summary of options
	<ul style="list-style-type: none"> ▪ C1) Sub-regional apportionment split by 3 yr average production; ▪ C2) Sub-regional apportionment split by 5 yr average production; ▪ C3) Sub-regional apportionment split by 10 yr average production; ▪ D1) Production levels and split by 3 year average production; ▪ D2) Production levels and split by 5 year average production; ▪ D3) Production levels and split by 10 year average production; ▪ E) Some other proportion, and if so, what?
Issue 6: Strategic approach to site selection	<ul style="list-style-type: none"> • Extensions vs. new sites. Is it more desirable in principle to concentrate working sites (where reserves exist), or to shift production to new sites? Is it appropriate kind of general distinction as a basis for site selection? • Concentration vs. dispersal. Is it desirable to concentrate mineral working in certain areas or is better to try and disperse sites? Is it appropriate to make this kind of general distinction as a basis for site selection? • "Cherry-picking" vs. a longer term strategy. Should we attempt to come up with a strategy for site location at all, or should we simply "cherry pick" that best sites given time? • Should commercial competition be a consideration? (i.e. should we try to ensure that a number of mineral producers are active in the area, so as to foster competition?).

3.2 SUSTAINABILITY COMMENTARIES

The following are sustainability commentaries that Bedfordshire County Council and Luton Borough Council can use as part of their consultation into the issues and options. They are designed to be cut and pasted directly into reports or onto display material and will be used to develop the preferred option. The detailed appraisal matrices can be found in Appendix 1.

Issue 1: Time Period of Plan Coverage

This issue has three options; 2018, 2021 and all alternative dates (alternative dates suggested by consultees were 2016 and 2031). There was no consensus from consultees as to which of the three options would be preferable. Supporting comments for 2018 include:

- It avoids having to identify sites prematurely and more careful phasing of site allocations is necessary with longer timescales;
- it gives greater accuracy to demand calculations and government requirements may change in the interim; and
- it nearer the government policy of 2016 (for aggregates provision).

Supporting comments for 2021 include:

- It is consistent with the East of England Plan and PPS12. It is assumed that adjoining authorities will also wish to align their Minerals DPDs with the East of England Plan and thereby achieve a regional consistency to mutual benefit;
- it is important from a sustainability viewpoint that an adequate supply of local materials is available to satisfy the needs of the Milton Keynes and South Midlands Growth Area;

- the 10-year Plan period is a minimum, rather than a maximum requirement and it would allow for potential slippage in the Mineral Development Document programme, thereby ensuring a Plan period of “at least 10 years”, from the date of adoption; and
- the concern raised by the County of the unreliability of minerals demand forecasts beyond 2016 can be resolved through an interim review.

Supporting comments for other dates includes:

- 2016: The Quarry Products Association considers that an end date of 2016 should be used, as this corresponds to the Government’s existing forecasts for aggregates provision; and
- 2031: would satisfy the second ‘wave’ of growth post 2021 of the MKSM growth area.

The sustainability appraisal found that on balance Option B (2021) would appear to perform better against the sustainability criteria than Option A as it would provide more consistency with other plans thus helping the mineral planning process to meet other sustainability targets. However, this is purely on the basis of consistency of time lines and does not take into account any site specific information. Therefore, it is recommended that any decision made regarding the timescale of plan coverage is undertaken with a consideration of the potential number and location of sites to be developed within the plan period. Please see Appendix 1 for the full assessment.

Issue 2: Aims and Objectives

This issue presents two alternative aims, one which reflects the aims of sustainable development and the sustainable communities’ agenda and one which reflects environmental protection. In addition to the aims, six objectives are also suggested. Again, there was no consensus reached through the consultation as to which option would be preferable. However, the consultees did make some useful comments as to how the aims and objectives could be strengthened. Some of these comments are listed below:

- As identified in PPS9 on nature conservation, the Core Strategy should present a spatial vision and strategic objectives, with an accompanying core policy, for the conservation, restoration and enhancement of important BAP habitats and species;
- the aims and objectives should also take into account the emerging East of England Plan;
- specific reference should be made to protecting the residential amenity of residents as currently the aims and objectives sections refer to “minimising adverse environmental impacts”;
- each of the aims should include “identity and safeguard appropriate landbanks”, to “make appropriate provisions and safeguard, where necessary, for the working of other mineral types” and to “specify and safeguard preferred sites”;
- the future role of mineral sites, former mineral sites and potential mineral sites and their relationship with and contribution to the Communities Plan and growth agenda should be referred to; and

- the subject of restoration and after use of mineral workings needs to be addressed in a more positive manner. For example, the final bullet-point could be much more robust in seeking to achieve net gains in biodiversity, informal public open space/access land, rights-of-way and other public amenities compared with that which subsisted before the commencement of working.

The sustainability appraisal found that it may be useful to combine the two aims, including recognition that the delivery of the environmental element of sustainability needs to be through protection and enhancement. Suggested additions to the objectives include recognition of the social impacts of mineral development, an objective to reduce the distance travelled in recognition of the importance of climate change and recognition of the importance of encouraging the use of recycled/secondary materials. It is felt that in individual subject chapters in the Core Strategy a fuller framework could be given in particular to the biodiversity and landscape agendas, perhaps including more specific strategic objectives. Please see Appendix 1 for the full assessment.

Issue 4: Landbanks

In total 11 options have been selected for testing through the sustainability appraisal (this equals the 10 options included in the issues and options paper plus the option of not splitting the landbank which has been included in this appraisal for completeness). These options are complex. However, the two important factors influencing the outcome of the appraisal are:

- How much concreting aggregate will be provided through each option (specifically through quaternary sand and gravels); and
- will the option assist Bedfordshire County Council and Luton Borough Council meet their sub-regional apportionment?

There was a mix of views expressed during the public consultation. Some people felt that the lowest figure was appropriate because it would limit the short term effects on the local environment from site allocations. Other felt that the government's apportionment figure was important especially due to the growth in development expected from the identified growth areas. At the stakeholder event at which the landbank options were specifically discussed, the following opinions were expressed by the group:

- The planning system should aim to meet the sub regional apportionment figure;
- more recycling needs to be encouraged in all cases;
- a lower figure would have knock on sustainability effects for other parts of the region;
- the split of the landbank needs to be based on available evidence and the likely market demand in the future;
- it was felt that current evidence supports a 60/40 split between concreting aggregate and building sands;

- 50/50 split would lead to an under supply of concreting aggregates which are less predictable than building sands and more likely to under yield; and
- 70/30 split would lead to an oversupply, meaning sites would take longer to work and communities would be exposed to negative effects for longer.

The sustainability appraisal found that Option C has the most positive sustainability effects as it ensures that the sub regional apportionment is met (ensuring the County is self sufficient as far as possible in terms of supplying building materials) and that concreting aggregate is neither under or over supplied. Out of the more detailed options within option C it is felt that the 60/40 split is a good middle ground that can be adapted if the proportions of building sand and concreting aggregate shift, thus minimising the risk of under and oversupply both of which have sustainability impacts. Options which minimise the need for new sites (single landbank, Option A, Option B1 and Option D1, D2 and D3) will minimise the environmental and community effects caused by mineral development in Bedfordshire from local sites. However, if substitution were to take place with other counties they would cause other sustainability effects such as increase in distance travelled and effects on sensitive receptors in other counties. Please see Appendix 1 for the full assessment.

Issue 6: Basis of Site Selection

Three options were tested as part of this issue:

- A. a presumption against mineral working in the upper Ouse valley (i.e. west of Bedford);
- B. concentrating future working of Greensand Ridge deposits around Leighton Buzzard / Heath and Reach or distributing it more widely to include Potton and other parts of the Ridge; and
- C. identifying all sites on the basis of their individual sustainability performance (determined via the sustainability appraisal), without reference to any broader locational strategy, in recognition of the over-riding fact that minerals can only be worked where they are found.

There was a mix of views expressed during the public consultation, a representation of which are listed below:

- Some consultees felt that the basis of site selection should be based on the impacts particularly impacts on residential amenity and some feel that the plan should not simply seek to concentrate mineral working in one area. While it is recognised that minerals can only be mined where they occur the burden of mineral extraction may be felt by communities for generations;
- a long term strategy for site selection would be preferable to "Cherry Picking". In the longer term it may be that if the current demand for aggregates continues the presumption against mineral extraction in the upper Ouse Valley should be reviewed;
- the new planning strategy should concentrate on the intensification of existing sites first provided that this strategy does not result in intolerably poor environmental conditions and/or environmental damage at these locations;

- a long – term strategy would appear the best, most sustainable option, especially in the light of the growth proposals and the need for a consistent and local supply over the next thirty years or so;
- it is neither appropriate to concentrate all extraction around Leighton Buzzard, nor to scatter such extraction over a wide area, a balanced approach between the two would appear the most sustainable option but evidence is needed to back this idea up; and
- English Nature would not support the relocation of mineral working in the upper Ouse Valley, where there are particular concentrations for wildlife habitats.

The sustainability appraisal found that:

Option 6a: The key element that is being assessed for this option is the different in sensitivity between the Upper Ouse Valley and other areas for mineral development. The Upper Ouse Valley is sensitive in terms of a number of criteria especially biodiversity, landscape and road transport. However, other areas in the county are also sensitive in terms of landscape and biodiversity (although, perhaps not as sensitive). If development did not occur in the Upper Ouse, strategic restoration benefits may be missed such as wetland creation opportunities and strategic flood risk attenuation. A key constrain, however, is that two of the 5 sites in the Upper Ouse Valley have significant objections from the County Ecologist and English Nature due to their proximity to sensitive SSSI sites (MD46 and 37).

Option 6b: The two options (concentrating development in Heath and Reach or distributing it more widely) have similar effects in many respects as both areas are equally as sensitive as regards issues such as biodiversity, landscape, employment etc. The main differences between the options are that effects on archaeology and cultural heritage would be of a higher magnitude if the strategy were dispersed but that the community effects would be of a higher magnitude if development were concentrated in Heath and Reach. Transport and climate change effects may also be of a lesser magnitude with a dispersed strategy because miles travelled to reach markets may be less.

Option 6c: Although sustainability appraisal is an important element in identifying effects (not least in terms of designing mitigation strategies and highlighting strategic environmental constraints), a more strategic approach to site selection needs to be incorporated into the plan development in order to allow a consideration of cumulative effects and potential long term benefits such as habitat creation and flood alleviation schemes. Please see Appendix 1 for the full assessment.

4.0 RESULTS OF THE SITE ASSESSMENT

4.1 INTRODUCTION

Each site has been assessed using the site assessment matrix. The assessment matrices for the sites are included within Appendix 2.

4.2 SUSTAINABILITY COMMENTARIES

The following are sustainability commentaries for each site that Bedfordshire County Council and Luton Borough Council can use as part of their consultation into the issues and options. They are designed to be cut and pasted directly into reports or onto display material and will be used to develop the preferred option.

Cluster 1: Sites East of Bedford

Cluster 1, Site: MD3, Willington Lock: The main issues to do with this site relate to the fact that part of the site is currently Grade 1 best and most versatile agricultural land, plus the fact that the site may cause nuisance to residential developments and is also close to a navigable river is used for recreation purposes. Care must also be taken to avoid adverse effects on the Danish Camp Riverside Visitor Centre. There is the potential for impact on the County Wildlife Site (CWS), Blunham Disused Railway however, damage might conceivably be avoided or compensated by ensuring only a small section of the CWS is lost and that development would not lead to the loss of priority habitat or species. These issues could be considered a constraint to the development of this site. There is the potential to enhance the CWS over the long term through the use of a carefully designed restoration programme. In addition, the current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework. The site lies within the floodplain of the River Ouse and there is potential for archaeological interest on the site. This site is in close proximity to residential developments and access to this site would mean that vehicles would have to pass through either Great Barford or Willington to access the strategic road network during the operation of the site.

Cluster 1, Site: MD6, Blunham/Roxton: The main issues to do with this site relate to the fact that part of the site is currently Grade 1 best and most versatile agricultural land, plus the fact that the site may cause nuisance to residential developments and is also close to a navigable river is used for recreation purposes. These issues could be considered a constraint to the development of this site. In addition the site lies within the floodplain of the River Ouse and there is potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and

there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework. This site is in close proximity to residential developments. However, the A421 has now been dualled to by-pass Blunham. The old road is still in use for local access, so direct access could be a possibility.

Cluster 1, Site: MD7, Blackcat, Chawston: The main issues to do with this site relate to the fact that the site is currently Grade 1 and Grade 2 best and most versatile agricultural land plus the site is also within close proximity to residential developments at Wyboston and also a navigable river which is used for recreation purposes. These issues could be considered a constraint to the development of this site. In addition, parts of the site are within the floodplain of the River Ouse and there is potential for archaeological interest on the site. However, the site offers opportunities for landscape and ecological improvement through the development of a suitable afteruse programme. This site has good access links to the A1 and A421 and existing direct access to Black Cat roundabout. Consideration needs to be given to residential areas in close proximity to this site and the traffic, noise and safety concerns for local residents of Wyboston.

Cluster 1, Site: MD8, Willowhill Farm, Moggerhanger: The main issues to do with this site relate to the fact that the site is currently Grade 1 and Grade 2 best and most versatile agricultural land plus the fact that the site is also within close proximity to residential developments. These issues could be considered a constraint to the development of this site. In addition, there is the potential for impact on the adjacent County Wildlife Site, part of the site lies within the floodplain of the River Ouse and there is potential for archaeological interest on the site.. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework. Although this site is in fairly close proximity to the A421 and the A1, this site is near to residential developments and access would mean that vehicles would have to pass in close proximity to Willington or Moggerhanger and this route can be narrow in some points. A bridleway falls within this site however there is an opportunity to improve this through extension to the north-east.

Cluster 1, Site: MD9, Dairy Farm: The main issues to do with this site relate to the fact that the site is currently Grade 1 and Grade 2 best and most versatile agricultural land plus that fact that the site is also within close proximity to residential developments and brings development slightly closer to Willington school. It is also near to a navigable river is used for recreation purposes. Care must also be taken to avoid adverse effects on the Danish Camp Riverside Visitor Centre. The site also has the potential to affect the setting of a scheduled ancient monument (Henge and Bowl Barrows). In transportation terms, the main concerns about this site for future mineral extraction are its close proximity to Willington and its links to the A421, although it is likely that access to the site could be gained via the established access to Willington Quarry. These issues could be considered a constraint to the development of this site. In addition, much of the site lies within the floodplain of the River

Ouse and there is potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework.

Cluster 1, Site: MD10, Bridge Farm, Great Barford: The main issues to do with this site relate to the fact that the site is currently Grade 1 and Grade 2 best and most versatile agricultural land plus that fact that the site is also within close proximity to residential developments and the two schools in Great Barford. It is also near to a navigable river is used for recreation purposes. The site also has the potential to affect the setting of a scheduled ancient monument and is close to Barford Conservation Area. In transportation terms, the main concerns about this site for future mineral extraction are its close proximity to residential areas and its links to the A421. It may also affect the Great Barford footpaths (4 and 21) and the Ouse Valley Way long distance walk during the operation of the site. These issues could be considered a constraint to the development of this site. In addition, there is the potential for impact on the adjacent County Wildlife Site, the site lies partly within the floodplain of the River Ouse and there is potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework.

Cluster 1, Site: MD11, Land at Octagon Farm South: The main issues to do with this site relate to the fact that the site is currently Grade 1 best and most versatile agricultural land plus that fact that the site also has the potential to affect the setting of a scheduled ancient monument. The site is also in close proximity to residential property at Octagon Farm. In transportation terms, the main concerns about this site for future mineral extraction are due to the potential for site traffic to pass through the residential developments of Willington and Moggerhanger. This site affects a MOD safeguarding direction. These issues could be considered a constraint to the development of this site. In addition, the site lies within the floodplain of the River Ouse and there is potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework. This site is effectively an "infill" site – all the surrounding land is being, or has been, already worked. This could represent effective resource efficiency to complete extraction via the proposal site.

Cluster 1, Site: MD12, Land at Octagon Farm North: The site is close to residential developments but the current working is closer than the proposal site. The site is effectively an "infill" site – all the surrounding land is already being worked. This could represent effective resource efficiency to complete extraction via the proposal site. It is also near to a navigable river is used for recreation purposes. These issues could be considered a constraint to the development of this site. In addition, the site lies within the floodplain of the River Ouse and there is potential for

archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework. Also the site is not classed as best and most versatile agricultural land.

Cluster 1, Site: MD30, Land north of Bedford Road, East of Willington: The main issues to do with this site relate to the fact that the site is currently Grade 1 best and most versatile agricultural land plus that fact that the site is adjacent to residential developments and brings mineral development right up the edges of Willington and slightly closer to Willington school. In transportation terms, there are concerns about its close proximity to Willington and the traffic management, noise and safety implications this would have on local residents and the safety implications of the increased number of vehicles using the A603. Willington footpath No 3 would be affected by the proposed scheme so the link to the Sustrans cycleway must be maintained or diverted. These issues could be considered a constraint to the development of this site. In addition, there is the potential for impact on the adjacent County Wildlife Site however, this is a priority area for the creation of wetland habitat and long term restoration plans could provide a benefit. The site lies within the floodplain of the River Ouse and there is potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework.

Cluster 1, Site: MD31, Land south of Bedford Road, Willington: The main issues to do with this site relate to the fact that the site is currently Grade 1 and Grade 2 best and most versatile agricultural land and that the site is in close proximity to residential developments at Cople and Willington. In transportation terms, there are concerns about its close proximity to residential areas and the traffic management, noise and safety implications this would have on local residents. These issues could be considered a constraint to the development of this site. In addition, the site is not constrained by any designations however, there is potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework.

Cluster 1, Site: MD32, Land south of Bedford Road, next to Wood Lane, Willington: The main issues to do with this site relate to the fact that it affects Grade 2 best and most versatile agricultural land. Also, site traffic would need to pass through Willington therefore the traffic management, noise and safety implications this would have on local residents would need to be taken into account in the consideration of this site. These issues could be considered a constraint to the development of this site. In addition, the site is not constrained by any designations however, and

there is potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework.

Cluster 1, Site: MD33, Land between Sandy Road and Wood Lane, Willington: The main issues to do with this site relate to the fact that the site is currently Grade 1 and Grade 2 best and most versatile agricultural land. Also, the site is in close proximity to residential developments at Willington and site traffic would need to pass through Willington, therefore the traffic management, noise and safety implications this would have on local residents would need to be taken into account in the consideration of this site. These issues could be considered a constraint to the development of this site. In addition, the site is not constrained by any designations however, there is believed to be the potential for Great Crested Newts in the area. There is also potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework.

Cluster 1, Site: MD34, Land east of Cople, south of Bedford Road, Willington: The main issues to do with this site relate to the fact that the site is currently Grade 1 best and most versatile agricultural land and the site will bring mineral development close to Cople and the school in Cople. These issues could be considered a constraint to the development of this site. In addition, the site is not constrained by any designations however, there is believed to be the potential for Great Crested Newts in the area. There is also potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework. The site is well placed to access the A421 without passing through any residential areas therefore not having any direct negative impacts on local residents. There is also a direct route from this site onto the A1. However, traffic using this route would pass through Willington and Moggerhanger.

Cluster 1, Site: MD35, Land north of Bedford Road, west of Willington: The main issue to do with this site relate to the fact that it may give rise to nuisance for the residents Willington. The site is not constrained by any designations however, it does lie within the floodplain of the River Ouse, and there is also potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework. The site is not classed as best and most versatile agricultural land. The site is well placed to access the A421 without passing through any residential areas therefore not having any direct negative impacts on local

residents. There is also a direct route from this site onto the A1. However, traffic using this route would pass through Willington and Moggerhanger.

Cluster 1, Site: MD39, Land at Cople: The main issues to do with this site relate to the fact that the site is currently Grade 1 and Grade 2 best and most versatile agricultural land and could cause nuisance to the residents of Cople. These issues could be considered a constraint to the development of this site. In addition, the site is not constrained by any designations however, there is also potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework. There is also a direct route from this site onto the A1. However, traffic using this route would pass through Willington and Moggerhanger.

Cluster 1, Site: MD47, NEW SITE: The main issues to do with this site relate to the fact that the site is currently Grade 1 and Grade 2 best and most versatile agricultural land and the site could cause nuisance to the residents of Cople. These issues could be considered a constraint to the development of this site. In addition, the site is not constrained by any designations however, there is also potential for archaeological interest on the site. The current condition of the landscape is judged to be poor and there is the opportunity for restoration of the mineral workings to contribute to the improvement of the wetland character and the ecological value of the river corridors, thus contributing to the objectives of the wider development framework. There is also a direct route from this site onto the A1. However, traffic using this route would pass through Willington and Moggerhanger.

Cluster 2: Sites in the Biggleswade Area

Cluster 2, Site: MD1, Land off New Road, Sandy: The main issues to do with this site relate to the fact that the site abuts the village of Beeston and could cause nuisance to this area as well as to residential properties in Seddington. Also, the family who live in Westray own the surrounding buildings and land. They strongly object to proposal and they own a covenant on the surrounding land which prevents such works. The site does not involve direct land take from designated sites. However, Sandy Warren SSSI is located close to this site, on the opposite side of the River Ivel. Nearby Warren Villas CWS is known to have populations of otters/water voles. Restoration presents an opportunity to link Warren Villas County Wildlife Site and to restore the land to wetland if appropriate. The site is considered as an Area of Archaeological Interest with the possibility of bronze age remains. It is not constrained by areas designated for landscape and the restoration phase of the development offers the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation.

Cluster 2, Site: MD4, Sandy Heath Quarry: The main issues to do with this site relate to the fact that the site falls within an Area of Great Landscape Value. The site is also within the landscape character designation of Type 6: Wooded Greensand Ridge. This is a large scale elevated landscape so development is likely to be visible from a large area. The site may cause nuisance to nearby residential developments and could cause negative impacts on Sandy from HGV traffic which would add to the traffic caused by an established operation at adjacent pit. There is no direct land take from designated wildlife sites. However, this is an area of strategic opportunity for heathland creation and adjacent to an agreed quarry heathland restoration.

Cluster 2, Site: MD5, Holme Green: The main issues to do with this site relate to the fact that much of the site is Grade 1 and 2 best and most versatile agricultural land and that operation may cause nuisance to nearby residential developments particularly Beauford Farm, Holme Grove and Holme Lodge. Development may also affect Sustrans Route 12. Although in close proximity to the A1, access to the site is difficult and substandard. Traffic from this site would be routed into Biggleswade or under the railway, both of which would have sustainability implications. A network of footpaths and bridlepaths are affected by the route and the proposed Great North Cycle route runs north-south through the centre of the site. The site is within the safeguarding zone for RAF Henlow. There is no direct land take from designated wildlife sites however there is potential for water voles and otters in drainage channels. There is the potential for enhancement to biodiversity and amenity value of the area given good restoration. Most of this site is in an Area of Archaeological interest and there is a Roman settlement nearby. The site is not constrained by areas designated for landscape and the restoration phase of the development offers the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation.

Cluster 2, Site: MD15, Land south of Broom village: The main issues to do with this site relate to the fact that the site bounds the River Ivel and Hiz County Wildlife Site and also the River Flit County Wildlife Site. It also affects a small area of Grade 2 agricultural land. Public consultation has raised an issue regarding trees which were planted at the intersection of field boundaries shortly after the enclosure at Southill in the late 18th century. There is the potential for enhancement to biodiversity and amenity value of the area given good restoration. The site may cause nuisance to residential developments, mainly Stanford, Broom and Langford. Although the Land at Broom Quarry site is located well for access to the A1 it is also situated close to residential developments. Any vehicles using this site would need to access it using local roads creating traffic management and safety implications for residents in local villages. Southill Footpath 6 and 7 are affected. There is the potential to provide new public access along SE and eastern boundaries to link the Navigator's Way to the Kingfisher Way long distance walk. The site is within the safeguarding zone for RAF Henlow. The site is within an Area of Archaeological Interest and the site adjoins Ivel navigation – former canal with Industrial heritage and recent commemorative planting for Whitbread Estates. The site is not constrained by areas designated for landscape and the restoration phase of the development offers

the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation.

Cluster 2, Site: MD16, Land east of Gypsy Lane, Broom: The main issues to do with this site relate to the fact that the site contains Grade 1 and Grade 2, best and most versatile agricultural land and abuts the village of Broom which could give rise to nuisance to the local community. This site is well located for access to the A1 however, the close proximity to residential developments may have implications for traffic management, noise and safety for local residents. The boundary between MD16 and 28 is a very important bridleway and must be protected. There is potential for water voles and otters. The site is not constrained by areas designated for landscape and the restoration phase of the development offers the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation. The circumstances of MD16 have now been taken over by the planning application which has been submitted, and the resolution of the County Council to grant planning permission for that development, subject to the prior completion of a legal agreement.

Cluster 2, Site: MD17, Land to the east of Potton Road, Potton: The main issues to do with this site relate to the fact that the village of Everton is already suffering from traffic congestion, which could be exacerbated if the site were developed. This site is located close to residential areas. And there may be particular transport concerns if site vehicles were travel through Everton towards the A1 and at the railway line crossing. The site is bounded on the north side by footpath Potton FP12 which would need diversion during site operation. The site is not constrained by areas designated for landscape and the restoration phase of the development offers the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation.

Cluster 2, Site: MD27, Land south of Beeston: The main issues to do with this site relate to the fact that the site abuts and brings mineral development closer to Beeston, causing potential nuisance and currently consists of Grade 1 and Grade 2 best and most versatile agricultural land. This site is located in a good position to access the strategic road network particularly the A1. However, in order to access the A1 any vehicles generated by this site would either have to travel through Beeston which would impose traffic management, noise and safety issues for local residents or would pass small number of dwellings at Brook End. Footpaths Northhill 11 and 15 and Sandy 11 and 40 would be affected which currently form part of the County's premier promoted route, the Greensand Ridge Walk as well as routes promoted by local groups. There is the opportunity for additional routes following restoration. The site is important for farmland birds, otters and water voles and there is the opportunity for further ecological and amenity enhancement with restoration. The site is within an Area of Archaeological Interest. The site is not constrained by areas designated for landscape and the restoration phase of the development offers the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation.

Cluster 2, Site: MD28, Land at Brooklands Farm: The main issues to do with this site relate to the fact that the site is currently Grade 1 and Grade 2, best and most versatile agricultural land, may cause nuisance to local residents and would cause Brooklands Farm to be landlocked. The site is within the safeguarding zone for RAF Henlow. There is an established HGV access from Broom Quarry. However, there is also a residential development in this location and consideration would need to be given towards any traffic, noise and safety implications, particularly from traffic turning westbound. Old Warden Footpath number 1 and 3 would be affected. Approximately 50% of this site is in an Area of Archaeological Interest and this is part of a wide area of pre-Roman archaeology to the west of Biggleswade. There is also a medieval castle nearby. The site is not constrained by areas designated for landscape and the restoration phase of the development offers the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation.

Cluster 2, Site: MD36, Ivel Farm, Sandy: The main issues to do with this site relate to the fact that the site is currently Grade 1 and 2, best and most versatile agricultural land and the development of the site may cause nuisance to residential developments adjacent to the site. The site is well located next to the A1 but would probably take access from the road to the superstore. At completion a possible new footpath including riverside length and connection to permissive path further north could be provided. Protected species previously recorded in the area include otter and water vole. The County Ecologist has indicated that MD36 is currently an extension of an existing quarry that has a restoration in hand to a range of biodiversity habitats. It is also within an important opportunity area for wetland priority habitat and long term restoration could enhance this habitat. The site is not constrained by areas designated for landscape and the restoration phase of the development offers the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation.

Cluster 2, Site: MD40, Land at Potton Road, Biggleswade: The main issues to do with this site relate to the fact that part of the site is currently Grade 1, best and most versatile agricultural land. The site is in close proximity to residential developments and although currently private agricultural land, according to public consultation responses is used extensively for informal recreation by the public. There is a proposed new housing site in close proximity to the site which would be affected. There are strategic transport issues with this site as any vehicles accessing the site from the A1 would pass through Biggleswade which would have effects on noise levels, safety and traffic management. English Nature has concerns regarding the proximity of the site to Sandy Warren SSSI. It is also near to Biggleswade Common County Wildlife Site. The site is considered as an Area of Archaeological Interest and there is a listed building in proximity to the site. The site is not constrained by areas designated for landscape and the restoration phase of the development offers the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation.

Cluster 2, Site: MD45, Land west of new road, Sandy: The main issues to do with this site relate to the fact that part of the site is currently Grade 1, best and most versatile agricultural land. The site may cause nuisance to existing residential developments, particularly Sandy to the north of the site and Beeston to the south west of the site. The site is well located in terms of its location to the strategic network; vehicles from the site can access the A1 via New Road. Safety of these vehicles joining the A1 from New Road would need to be taken into consideration. No public paths cross the site but land alongside the river forms part of the Kingfisher Way by a permissive path. Development of the site offers an opportunity to formalise this arrangement. There is no direct land take from designated wildlife sites, however the site is in the vicinity of Sandy Warren SSSI, and also abuts The Riddy local nature reserve. The site is not constrained by areas designated for landscape and the restoration phase of the development offers the opportunity for some enhancement to the existing landscape value of the area. However the site could be visible from a reasonably large area during operation.

Cluster 3: Sites in the Leighton Buzzard Area

Cluster 3, Site: MD13, Land North of Billington: The site is within close proximity to the residential area of Billington and will bring mineral development nearer to the settlement. The site will also bring minerals development closer to proposed housing development at Pratt's Quarry and Grovebury Farm. The public workshops indicated a concern that the site is part of open countryside which forms a natural boundary between Leighton Buzzard and Billington – there are major concerns that this break would be lost, resulting in the village losing its identity. Given the history of redundant sandpits in the area (given over to housing), there would need to be a guarantee of future protection from such uses in order to retain this break in development. The public workshops indicated a concern about health impacts from noise, dust and air pollution from more sand extraction in the area. There were particular concerns about impact on Wayside Farm, which would be surrounded by quarries. In the long term, the site could contribute to green infrastructure this would have a positive effect. The site does not conflict with areas of best and most versatile agricultural land. Although this is an extension to an existing quarry, from a land use and transport outlook this site is not well located as the route to the operators plant site through Leighton Buzzard and along the Vandyke Road is unpopular with local residents and the only alternative (via the A5) would require major junction improvements.

Cluster 3, Site: MD14, Land at Mile Tree Farm, Heath and Reach: Public consultation has revealed a concern about air pollution impacts and future potential use as landfill. There is likely to be a cumulative noise effect in association with the noise levels from existing plant at Double Arches Quarry. The site is located within the Growth Area to the east of Leighton Buzzard and in the long term could provide much needed green infrastructure. In addition the area is shown as an opportunity area for heathland and acid grassland and could have a positive effect in the long term if

the site was worked and restored to this after use. The site does not conflict with areas of best and most versatile agricultural land. South Beds District Council feel that the prospect of using Leighton Buzzard Narrow Gauge Railway to help transport extracted material should be investigated. This location benefits from being an extension to an existing site and is in close proximity to the A5. However, vehicles would need to use local roads to access it and this would add to already existing traffic using the local roads particularly through Heath and Reach. There are also safety implications of traffic joining the A5. Vehicles traveling along the A5 and onto the bypass towards the new M1 junction would pass through Hockliffe creating traffic management implications and safety for local traffic. Two important bridleways cross the site and these provide access to Hockliffe, Pottsgrove and Battleden from Heath and Reach. The nature of the effect would depend upon mitigation.

Cluster 3, Site: MD21, Land East of A4146 Billington: The public workshops indicated a concern that the site is part of open countryside which forms a natural boundary between Leighton Buzzard and Billington and that this break would be lost if the site were developed. Given the history of redundant sandpits in the area being redeveloped for housing, future protection from such uses would be required in order to retain this break in development. There will also be impacts on new residential development. The public workshops indicated a concern about health impacts from noise, dust and air pollution from more sand extraction in the area. The site may cause nuisance to residential developments, especially at Billington. From a transport perspective this site is well located to the strategic road network and would be worked as an extension to the existing Grovebury Road quarry which has an established access direct to the A505 and does not pass any residences. The proposal site would not intensify HGV traffic over existing use. A right of way extends along part of the site boundary. The nature of the effect would depend upon mitigation. The site does not conflict with areas of best and most versatile agricultural land. The site is located within the Growth Area to the east of Leighton Buzzard and in the long term could provide much needed green infrastructure.

Cluster 3, Site: MD43, Land between Gig Lane and Eastern Way, Heath and Reach: The site may cause nuisance to residential developments in Heath and Reach particularly as the site is within 500m of the school in Heath and Reach. This school is currently surrounded by active quarries. The site is located within the Growth Area to the east of Leighton Buzzard and in the long term could provide much needed green infrastructure. This is one of the few remaining green areas that abut the village. The site does not conflict with areas of best and most versatile agricultural land. This site is in close proximity to the A5 however, vehicles would need to use local roads to access it and this would add to already existing traffic using these local roads and impose safety implications for vehicles joining the A5. Heath and Reach is a residential settlement which is in close proximity to this site and consideration would need to be given to local residents and the suitability of this site for mineral extraction. Vehicles travelling along the A5 and onto the bypass towards the new M1 junction would pass through Hockliffe creating traffic management implications and safety for local traffic. There are also concerns that Gig Lane is currently the only safe pedestrian route eastwards at

the south of the village and that this would be lost. There are also concerns about the potential impact on the current character of this road.

Cluster 4: Sites in the Upper Ouse Valley

Cluster 4, Site: MD18, Bury Farm Pavenham: Stevington Marsh SSSI is located nearby which includes sensitive wetland communities. The nature of the effect on this resource is uncertain without further details. However, English Nature has stated that they would not wish to see any impacts upon this site and according to the Beds Wildlife Trust otter populations are known to be present on the site. In the long term the site could form part of a more widespread mitigation / restoration strategy in the Upper Ouse and this needs further investigation. The site is within an Area of Great Landscape Value (AGLV) and has a strong sense of character as recognised by the AGLV designation. The site does not conflict with areas of best and most versatile agricultural land. This site is more remote from communities than other sites and is a relatively small site. Access to this site would mean that HGV's would need to use the local roads before it can access the strategic roads, having impacts upon noise and safety. Footpath Pavenham 7 bisects the site. This path gives access to the riverside and Radwell. It forms part of a locally promoted route and the long distance Ouse Valley Way. The original ground levels should be restored once the quarry is worked so there will be no long term effect.

Cluster 4, Site: MD19, Land North of Bromham: This site is adjacent to an Area of Great Landscape Value (AGLV). This area has a strong sense of character as recognised by the AGLV designation. The site affects Grade 2, best and most agricultural land. This site is located close to the A421 and A6 however; to access these strategic routes would mean vehicles would have to pass through the residential areas of Bromham or Oakley and creating HGV traffic through these residential areas would have significant traffic, noise and safety implications. Housing development has been proposed off Lower Farm Road, Bromham which may add to the traffic problems in this area. There is permissive access along the Oakley Road edge of the field avoiding a busy road. Development may also affect Stevington Country Way. No water resource constraints have been identified. With appropriate restoration the site could contribute to the Ivel and Ouse Countryside Project.

Cluster 4, Site: MD37, Land at Westfield Farm, Oakley: The site affects the SSSI and County Wildlife Site of Stevington Meadow and Marsh. English Nature object to this potential site, as it includes Stevington Marsh SSSI, which contains sensitive wetland and grassland communities. The spatial extent of this impact could be widespread if the development affects two such valuable sites. Mitigation could not reduce the impact. The effect would be long term and would be irreversible. The site also affects the Area of Great Landscape Value of the Upper Ouse. This area has a strong sense of character as recognised by the AGLV designation. With appropriate restoration the site could contribute to the Ivel and Ouse Countryside Project. The site may cause nuisance to residential

developments at Pavenham, Oakley and Stevington. There is poor access to this site via tracks which lead to movement to or from the site through Oakley or Pavenham giving traffic management, noise and safety implications for local residents. This site is also accessible from the A428 however, vehicles using this route would be on minor roads which pass through small villages and may create traffic management, noise and safety issues.

Cluster 4, Site: MD46, Land at Hill Farm, Chellington: Development of this site will need to ensure there won't be an impact on the nearby County Wildlife Site of Chellington Hill Farm. The County Ecologist has indicated that proposals to quarry this area should not go forward for further consideration. English Nature state that there is a need to ensure there won't be impacts on Felmersham Gravel Pits, a sensitive wetland SSSI located nearby. The site is also adjacent to Harrold Odell CWS. This site affects an Area of Great Landscape Value and is also within close proximity to Harrold Odell Country Park. The park has been looking into buying this land as an extension. Consultees are not in agreement as to whether mineral development would help this or hinder it. This area has a strong sense of character as recognised by the Area of Great Landscape Value (AGLV) designation. The site does not conflict with areas of best and most versatile agricultural land. The site may cause nuisance to residential developments at Harrold, Carlton, Odell and Felmersham. The site will also have an impact on amenity at Harrold-Odell Country Park during operation. The northern part of the site is bordered and crossed by Felmersham Footpath 6. Both are well used and link to Harold Odell Country Park. This is a strategic link in Kingfisher Way long distance trail. It is unclear whether the development would have an impact on these routes. The site is not located close to the strategic road network. Access to this site can be gained via the A6 although this would increase traffic already using this road and will add to the numbers of vehicles already using this network. Safety of these vehicles joining the A6 would also need to be taken into consideration. Once off this route access to the site is via local roads and the route to the site passes through small villages giving traffic management, noise and safety implications, particularly in Felmersham.

Cluster 4, Site: MD48, NEW SITE: This site encompasses a small County Wildlife Site (CWS). The CWS is based on a small old gravel pit and restoration of the larger proposal site could extend CWS. Care would be needed to ensure that the site is developed sympathetically to the current designated site. The site is within an Area of Great Landscape Value and this area has a strong sense of character as recognised by the Area of Great Landscape Value (AGLV) designation. Part of the site is Grade 2 best and most versatile agricultural land. This site is more remote from communities than other sites. Access to this site would mean that HGV's would need to use the local roads before it can access the strategic roads, having impacts upon noise and safety. However, this is a short length of local road and HGVs would not have to pass residences. In the long term sites within the Upper Ouse Valley could provide opportunities to alleviate flood problems. The nature of this impact is uncertain and would require further investigation. The site is in an airfield safeguarding zone.

Cluster 4, NEW SITE: MD49, Site Adjacent to Land at Hill Farm, Chellington: Development of this site will need to ensure there won't be an impact on the nearby SSSI of Chellington Hill Farm. The County Ecologist has indicated that proposals to quarry this area should not go forward for further consideration. English Nature state that there is a need to ensure there won't be impacts on Felmersham Gravel Pits, a sensitive wetland SSSI located nearby. The site is also adjacent to Harrold Odell CWS. This site affects an Area of Great Landscape Value and is also within close proximity to Harrold Odell Country Park. The park has been looking into buying this land as an extension. Consultees are not in agreement as to whether mineral development would help this or hinder it. This area has a strong sense of character as recognised by the Area of Great Landscape Value (AGLV) designation. The site does not conflict with areas of best and most versatile agricultural land. The site may cause nuisance to residential developments at Harrold, Carlton, Odell and Felmersham. The site will also have an impact on amenity at Harrold-Odell Country Park during operation. The site is bordered by a bridleway. Without details of mitigation it is unclear whether the development would have an impact on this route. The site is not located close to the strategic road network. Access to this site can be gained via the A6 although safety of the vehicles joining the A6 would need to be taken into consideration. Once off this route access to the site is via local roads and the route to the site passes through small villages giving traffic management, noise and safety implications, particularly in Felmersham.

Cluster 5: Other Areas

Cluster 5, Site: MD2, College Farm Salford: Part of this site contains the County Wildlife Site (CWS), Salford Wood (an area of ancient woodland). English Nature has concerns about damage/loss to the CWS. The County Ecologist has indicated that proposals to quarry this site are clearly contrary to the principles of PPS9 and the site should not go forward for further consideration. The site does not conflict with areas of best and most versatile agricultural land. With appropriate restoration the site could contribute to the aims of Forest of Marston Vale (see MWLP appendix 4). It is also a BAP opportunity area for woodland, neutral grassland and hedgerows. There are rights of way along parts of the site boundary and there is uncertainty as to whether the development would affect these. The site is an extension to existing working with established HGV access. However, in order to access this site, traffic would either have to pass through the village of Salford via the local road which is accessed via the A421 or it could travel west to join A5130 near Milton Keynes which would avoid the need to pass residences on local roads. Vehicles entering the site via the local road would have implications for traffic management through Salford, and on reaching the Strategic A421 signing at the complex M1 junction and safety for local traffic. The site affects an airport safeguarding zone. However, it is an extension of an existing working which has not caused problems.

Cluster 5, Site: MD20, Land at Whitsundoles Farm Salford: The site is not constrained by areas designated for ecology, archaeology or cultural heritage and does not threaten the qualities of designated areas. However, it is within the vicinity of Salford Wood CWS and care should be taken to ensure that development does not affect the site. The site is not within an Area of Archaeological potential. With appropriate restoration the site could contribute to the aims of Forest of Marston Vale. The site is also a BAP opportunity area for woodland, neutral grassland and hedgerows. However, site affects Grade 2, best and most versatile agricultural land. The site is further away from residential developments than most of the other sites. The site is an extension to existing working with established HGV access. However, in order to access this site, traffic would either have to pass through the village of Salford via the local road which is accessed via the A421 or it could travel west to join A5130 near Milton Keynes which would avoid need to pass residences on local roads. Vehicles entering the site via the local road would have implications for traffic management through Salford, and on reaching the Strategic A421 signing at the complex M1 junction and safety for local traffic. There are rights of way within this site. Mitigation will need to be included to ensure that the rights of way network is not disturbed. The site affects an airfield safeguarding zone. This area has been identified as a potential area for the Milton Keynes expansion. The site is an "infill" to land already worked / working for minerals and this would optimise resource exploitation from the site as a whole.

Cluster 5: Site: MD22, Land at Warren Woods, South of Clophill: This site lies within the County Wildlife Site of Warren Wood (ancient woodland which is likely to contain wet woodland, a national priority habitat). The County Ecologist has indicated that proposals to quarry this site are clearly contrary to the principles of PPS9 and the site should not go forward for further consideration. The site does not affect areas of best and most versatile agricultural land. Public footpath FP3 runs diagonally across the site in part along an avenue of Hornbeams which have historical value. Mitigation will be key to ensuring the coherence of the network of public rights of way. The site has a good strategic link to the A6. However, consideration needs to be given to the vehicles using this site as the existing road network Traffic generated by the site is also likely to use the A507 which is a single carriageway route and in some parts is unimproved. Therefore an increase in traffic to and from this site will also add to the congestion that already exists where the A507 meets the A6. The site is within the safeguarding zone for RAF Henlow.

Cluster 5, Site: MD23, Land to the West of Houghton Conquest: English Nature object to this potential site, as it is very close to Kings Wood and Glebe Meadows SSSI. Bedfordshire Wildlife Trust state that Great Crested Newts are known to be present in the Marston Vale therefore an ecological assessment will be required if the site is to be developed. The site may have a negative cumulative impact as it is on the other side of the road to the NIRAH development. NIRAH is a freshwater sanctuary, a resource for conservation and education. However, NIRAH is only a proposal at this time and the site (Quest Pit) is currently an active clay extraction site. There is also likely to be cumulative impacts given the proximity of existing clay pits, (Quest, Rookery) and also Stewartby landfill. The site may cause nuisance to residential developments at Houghton Conquest. There are

rights of way within the site and mitigation is needed to ensure that the rights of way network is not affected. The current operation at Quest (the pit subject of the NIRAH proposal) uses conveyor belt to transport clay to Stewartby Brickworks and therefore it is possible that a similar method could be used from proposal site, although this would have to cross over or under road. If road transportation were used the site is well located in terms of the strategic road network with the main A421 in close proximity however; access to the site is likely to be disrupted with the Highway Agency's improvements to the A421. All of this site lies within an MOD safeguarding direction.

Cluster 5, Site: MD24, Sundon Quarry: This site lies within the County Wildlife Site (CWS) of Sundon Chalk Pits. English Nature object to this potential site as it will destroy Sundon Chalk Quarry SSSI and Sundon Chalk Pits CWS. The County Ecologist has indicated that proposals to quarry this site are clearly contrary to the principles of PPS9 and the site should not go forward for further consideration. There are significant regenerative trees and woodland on the site which are likely to have significant nature conservation value in the light of the CWS and SSSI designations. This site lies within the Green Belt and lies partly within the Chilterns AONB. Most of the land is designated as open access land under the CRoW Act. The site does not contain Areas of Archaeological Potential or designated sites. The site does not conflict with areas of best and most versatile agricultural land. The site is a BAP calcareous grassland opportunity area. The site may cause nuisance to residential developments at Sundon. In addition, growth to be delivered as a result of the Milton Keynes and South Midlands SRS to the north of Dunstable, Houghton Regis and Luton it will bring residential development closer to the quarry site. There is "another route with public access" running east-west across the site from Upper Sundon to the Midland Mainline. There is also a footpath running in roughly the same direction from Upper Sundon to Chalton. The site affects a number of routes which form part of the regionally important Chiltern and Icknield Way. Mitigation would be needed. The Highways Agency state that they would need to be satisfied that the site would not be detrimental to the flow of traffic on trunk roads. Although this location is close to the M1 there are no junctions to access it that are in close proximity. With this being the current situation any traffic generated by the site would have to pass through the local roads and small villages which causes negative traffic, noise and safety implications for local residents. The site is located on a railway and material extracted on the site could potentially be transported this way (comment by South Bedfordshire District Council). This should be investigated. All of this site lies within an airfield safeguarding zone.

Cluster 5, Site: MD25, Houghton Regis Quarry: Part of this site lies within the County Wildlife Site of Houghton Regis Chalk Pits and part of the site is SSSI. The County Ecologist has indicated that proposals to quarry this site are clearly contrary to the principles of PPS9 and the site should not go forward for further consideration. English Nature also object to this potential site. The site is not within an Area of Archaeological Potential. The site is not constrained by designated sites or Conservation Areas. The site does not conflict with areas of best and most versatile agricultural land. The site may cause nuisance to residential developments in Houghton Regis, and some recently completed houses in Millers Way. It is likely that allocations in the Local Plan will bring further

housing development closer to the site. Residential growth as part of the Milton Keynes South Midlands Sub Regional Strategy would also bring development closer to the northern flank of the site. This would largely surround the site with residential development which would bring mineral development into direct conflict with a large number of houses. Houghton Regis footpaths 1,3 and 31 all affect the site. In addition these form part of the Chiltern and Icknield Ways plus provide important link to Blue Waters woodland open space for residents. Mitigation would be needed. The site lies within the Nitrate Vulnerable Zone. A reservoir appears to exist in this quarry which would appear to prejudice it's re-opening. The site is also above a major aquifer. All of this site lies within an airfield safeguarding zone.

Cluster 5, Site: MD26, Land at Medbury Farm, Elstow: All of this site is within an Area of Archaeological Interest including a likely Roman/medieval settlement. It also forms part of the John Bunyan Trail and affects the setting of Elstow ancient monument. Nearly all of this site is within Grade 2 and Grade 3, best and most versatile agricultural land. With appropriate restoration the site could contribute to the aims of Forest of Marston Vale. The site is also a BAP opportunity area for wetland and woodland, neutral grassland & heathland. The site may cause nuisance to residential developments in Elstow and Shortstown. There are rights of way issues within this site and mitigation would be needed to ensure the integrity of the rights of way network. The Highways Agency state that they would need to be satisfied that the site would not be detrimental to the flow of traffic on trunk roads. Currently this site is strategically well placed. However, access to the strategic network from this site is likely to change in the future. *The Wixams* new development is planned for 3 miles south of Bedford between the A6 and the B530. The site will be centred around the old industrial and storage site called the Elstow Storage Depot which is in close proximity to this site. The realignment of the A6 will have consequences to the access of this site, it is anticipated within the development plans that a new roundabout will be provided on the A6 at the existing access road that meets the A6, consequently maintaining good access to the site. Vehicles would need to make good use of this access to relieve traffic from Elstow village. All of this site lies within a MOD safeguarding direction. It is also close (c 1km) to Met Office meteorological station at Cardington Airfield, which is highly dust sensitive.

5.0 RESULTS OF THE ASSESSMENT OF SITE CLUSTERS

This section aims to discuss the significant positive and negative impacts of the 4 clusters, and to highlight potential overall impacts of each cluster. The full cluster assessment tables can be seen in Appendix 3.

Cluster 1 (Sites to the East of Bedford)

Landscape: The cluster has a landscape character designation of Type 4: Clay River Valleys and this landscape is in an overall poor condition. The landscape strategy for the area is to improve features of the landscape that evoke a strong sense of place such as areas of pasture which help to distinguish the valleys from the adjacent vales. Phased working and restoration could mitigate these impacts. There is potential to improve the wetland character of the area and the ecological value of the river corridors. Care would be needed to reduce the visual impact of sites particularly if more than one site is developed either at the same time or sequentially in this cluster as some of the sites will be visible from a significant distance.

Land take: Approximately 15% of the cluster is of Agricultural Land Value 1 and 40% Agricultural land value 2. These areas are designated by DEFRA as the highest quality agricultural land. This value will be lost if the site is restored for uses other than agriculture. This would represent a significant loss of agricultural land of high quality in this area.

Human health and amenity: The cluster is mainly located along the River Great Ouse which is a navigable river at this point and is used for recreational purposes (such as boating, walking, and cycling). If numerous sites were developed within the cluster, it could negatively affect its recreational value/use. Care must also be taken to avoid adverse effects on the Danish Camp Riverside Visitor Centre. If the sites in this cluster were to be developed there would be negative in the short and medium term. This is due to the close proximity of the minerals sites to residential developments. Settlements affected would include Great Barford, Willington, Moggerhanger, Cople, and Wyboston.

Transportation: Several of the sites in the cluster are within 1km of the strategic highway network (Sites MD 31, 32, 33, 35 and 39) but some sites would have to move minerals via LGV through local villages such as Great Barford, Roxton and Kempford. Careful routing would be required to minimise the negative impacts of mineral transportation. The River Great Ouse is close to the boundary of many sites in the Cluster. This river is navigable from this point to the North Sea at King Lynn and is currently used for recreation. This river represents a potential opportunity to carry minerals by barge from some of the sites to an unloading point downstream from Cluster 1. Appropriate barges (River has a 50 tonne barge carrying capacity) and loading and unloading infrastructure would be required. Assuming this mode was considered, care would have to be taken not to disrupt the amenity and biological value of the river as well as allowing access to the bridleway that follows much of the route of the river. A dismantled railway, part of the old Bedford to Cambridge line, runs through the cluster.

Currently this is used as part of the national cycling network Sustrans route 51. The Bedfordshire Railway Transport Association would like to see full re-opening of this route to Willington. This would mean that a large amount of quarrying material could be taken by rail. The cost and feasibility of this needs investigation to identify whether there is likely to be a cumulative effect. There are some issues with pipeline infrastructure. An oil pipeline crosses MD7 and a dual water main crosses MD35, and there are overhead power lines crossing MD3, 6, and 9. These may need to be diverted or safeguarded on these sites. Four sites are crossed by footpaths whilst a further four have footpaths on the boundaries including the north part of MD6 which is surrounded by footpaths.

Biodiversity and earth science: The cluster is located along the course of River Great Ouse down stream of Bedford. The closest SSSI is 4.5km from cluster and there are no NNRs within 5km. The main issues are maintaining the water table and flood plain issues. Care would have to be taken not to permanently damage priority plant and wildlife populations though these sites could be restored to increase wetland habitats thus increasing biodiversity in the long term. A potential opportunity for strategic Biodiversity restoration lies around the village of Great Barford.

Archaeology and cultural heritage: About 50% of the cluster is covered by an Area of Archaeological Interest. Apart from a few identified specific issues (sites MD 7,9,11). The overall nature of the archaeological and cultural effect is uncertain without further investigation into the likelihood of archaeological finds within the cluster.

Conservation and protection of water resources: All of the sites have some land in the floodplain of the River Great Ouse. Significantly affected sites (by area) are MD3, 6, 7, and 9 where production during flood events may be partly or totally curtailed. All of the sites are also wholly or in part within the Bedford internal drainage board area. If the sites were remediated to store water they may provide opportunities to alleviate flooding lower down the River Great Ouse downstream from Bedford or to provide additional water resources to help the river in drought periods. There are uncertainties about the nature of the impact and further investigation is required.

Effects in combination with other plans and projects: A review of the Bedford Development Framework Core Strategy and Rural Issues Plan Preferred Option and the Mid Bedfordshire Local Plan (Adopted 2005) highlights the following issues:

- There are no identified plans for large scale housing development within Cluster 1;
- The opening of the Great Barford Bypass in 2006 should reduce congestion in Great Barford and create a new route for the transportation of minerals in the Cluster.

Cluster 2 (Sites in the Biggleswade Area)

Significant environmental and social effects for Cluster 2 have been identified for:

Biodiversity and earth science: The cluster is located along the River Ivel. There is no direct land take from designated sites. However, there will potentially be cumulative negative effects on an NNR, SSSIs and CWSs. Care will need to be taken to protect the NNR, SSSIs and CWSs in the area. There is a lot of potential for habitat re-creation during site restoration.

Landscape: The cluster has a landscape character designation of Type 4: Clay River Valleys. This landscape is in an overall poor condition. The landscape strategy for the area is to improve features of the landscape that evoke a strong sense of place such as areas of pasture which help to distinguish the valleys from the adjacent vales. The wetland character of the area also needs to be improved along with the ecological value of the river corridors. The cumulative impacts on landscape will be potentially significant as many of the sites will be visible from a wide area. The cluster is adjacent to an Area of Great Landscape Value (AGLV) and one of the sites falls within the AGLV. Phased working and restoration could mitigate these impacts.

Land take: Most of the sites in this cluster are in part or entirely classified as either Grade 1 or 2 agricultural land. These areas are designated by DEFRA as the highest quality agricultural land. This value would be lost if site restoration was for purposes other than agriculture which may happen due to changes in landfill regulations. See www.qpa.org/pdf/inertfull.pdf on inert wastes. Minerals development may mean that the land cannot be restored to agricultural use and may therefore negatively affect areas of best and most versatile agricultural land.

Human health and amenity: If the Cluster was developed there would in the short to medium term be additional negative impacts to the village of Heath & Reach which is effectively surrounded by existing quarry activities. There is risk that future restoration of the quarry sites between Leighton Buzzard and the village of Billington will be used for housing thus joining the two settlements.

Transportation: Road traffic is the main transportation option for the minerals sites. The quarry traffic would reduce once the sites have been closed. The sites in this cluster are close to the A1. However, sites to the east of the A1 will need to travel significant distances to avoid travel through villages or conurbations. An increase in road traffic will have a negative impact on local residents and the environment. In the cluster there is a potential opportunity to use the railway network. Site MD 5 is adjacent to a rail line and most other sites in the cluster are less than 2 km from a rail line. However there are currently no loading and unloading facilities on this section of line for aggregates.

A large number of footpaths can be found in this cluster. Several footpaths will be affected by the development, including Footpaths Southill 6 and 7, Potton 12, Northill 11 and 15, Sandy 11 and 40, Old Warden 1 and 3. Some of these footpaths form part of Greensand Ridge Walk, the County's premier promoted route this would cause disruption to the footpaths in the area during development

of the minerals sites and would require relocation of walking routes while the minerals site were operating.

Archaeology and cultural heritage:

About 90% of the cluster is covered by an Area of Archaeological Interest. Apart from a few identified specifically identified archaeological issues (for sites MD 7,9,11). The overall nature of the archaeological and cultural effect is uncertain without further investigation into the likelihood of archaeological finds within the cluster.

Conservation and protection of water resources: A number of the sites in this cluster are on a floodplain. Parts of sites MD 1, 27, 36, 40 and 45 are within Flood Zone 3 (High Risk). Sites MD 1, 5, 27, 40, and 41 are within internal drainage board areas. Climate change predictions identify that flooding may become more common as global temperatures rise. However restoration opportunities could include schemes to store floodwater thus reducing future flooding. There are uncertainties about the nature of the impact and further investigation is required.

Effects in combination with other plans and projects: A review of the Mid Bedfordshire Local Plan (Adopted 2005) highlighted the following issues:

- In Biggleswade plans to build a large housing development (2,100 dwellings) to the east of the settlement in combination with the proposed minerals sites to the west may potentially have a significant negative effect on local residents.
- Smaller scale housing development in Langford (approximately 60 dwellings) and Polston (approximately 180 dwellings) in combination with the proposed minerals sites close to the settlements in the cluster may have negative effects on local residents.
- In Biggleswade and Sandy proposed extensions to employment zones and new employment zones in combination with the proposed minerals sites close to the settlements may lead to increased traffic levels. This could affect local air quality and be a nuisance for local residents. In Biggleswade there is also an area of land safeguarded for retail warehouse development which could also increase traffic levels, particularly from HGVs.
- The rail-served warehousing in Sandy is to be safeguarded due to its close connection to the A1. However, the rail-served warehousing in Biggleswade will not be safeguarded as its connections with the local highway network are poor and it could lead to an increase in HGV traffic.
- The plans do not mention the development of specific traffic calming measures in any of the settlements likely to be affected by the proposed minerals sites in this cluster. There are plans for traffic calming within the new residential developments.
- The A1 in Mid Bedfordshire is considered to be inadequate particularly around Sandy. The road is constructed to a historic design standard which is inappropriate to the volume of the traffic. If traffic levels on the A1 increase due to the development of minerals sites in this Cluster the problems of poor infrastructure could be exacerbated.

Cluster 3 (Sites in the Leighton Buzzard Area)

Please note that Cluster 3 is different from any of the other three clusters in terms of the potential minerals in the sites. Where clusters 1, 2 and 4 are sand and gravel, the sites in Cluster 3 are mainly silica sands. Silica sand is less commonly occurring than other sands and used mainly for industrial purposes.

Human health and amenity: If the Cluster was developed there would in the short to medium term be additional negative impacts to the village of Heath & Reach which is virtually surrounded by existing quarry activities. There is risk that future restoration of the quarry sites between Leighton Buzzard and the village of Billington will be used for housing thus joining the two settlements. A small number of individual properties would also be significantly negatively impacted. The long term impact is uncertain.

Transportation: Road traffic is the most likely transportation option for the minerals sites but the quarry traffic would diminish once the sites had been completed. However, there is a potential opportunity to explore using a private railway to transport goods from MD14 though Leighton Buzzard to the South of the town reducing the potential traffic though Leighton Buzzard and local villages. The mainline rail route is within 3.5 km or less of all the Cluster sites but there are no loading facilities available for aggregates.

Conservation and protection of water resources: The Cluster is not on the floodplain though it is located on the boundary of MD21. 75% of the sites are on the edge of Internal Drainage board areas. These are zones with are managed by the Local Authority concerned with matters of land drainage and the maintenance and control of certain watercourses. The mineral sites could have a cumulative positive or negative effect on local drainage and water management. Cluster 3 is located in a nitrate vulnerable zone and there are uncertainties of the impact of the cluster on the local floodplain and the local pumping station at Sandhouse, further investigations are required.

Biodiversity and earth science: Two of the four sites have been identified by local people as having locally significant plant and wildlife, some of which is protected, including badgers. However, this has not been confirmed through survey. It is assumed that care would need to be taken to preserve or transfer any significant local wildlife and plant value of existing sites and prevent damage to a local NNR and country parks.

Archaeology and cultural heritage: Some of the sites are adjacent to Areas of Archaeological Interest. The overall significance of the archaeological and cultural effect is uncertain without further investigation into the likelihood of archaeological finds within the cluster.

Landscape: The entire cluster is within the Greenbelt. Whilst this does not preclude minerals development it does mean that restoration would have to ensure that the open nature of the green

belt is restored. The cluster is not within an Area of Great Landscape Value but at least three of the sites have had local concerns expressed about loss of visual amenity. Many of the sites could be visible from a distance whilst the sites are active.

Waste management (relevant to this cluster only due to the presence of silica sand sites): There is no information from the sites appraisal on this topic; therefore no clear cluster assessment can be made. The question relates to the amount of waste that has to be disposed of to extract one tonne silica sand.

Effects in combination with other plans and projects: A review of the South Bedfordshire Local Plan (Adopted 2004) and the Milton Keynes and South Midlands Sub-regional Strategy (March 2005) highlighted the following issues:

- The area of Luton, Dunstable and Houghton Regis is proposed as a regional growth zone, with 26,300 new homes to be built by 2021. Leighton Linlade will absorb some of this housing growth. House building at this scale will require significant minerals resources. To build an average house the Quarry Products Association (QPA) states 60 tonnes⁴ of aggregates is required. Using this figure from the QPA a total of 1.6 million tonnes of aggregate (primary, recycled or secondary) will be required to meet this house building target. House building at this scale could potentially also have a negative impact on the area, particularly in terms of increased traffic, landscape and other impacts on local residents.
- Traffic congestion in the principal urban areas of Dunstable, Houghton Regis and Leighton Buzzard and also in more rural areas has been identified as a serious issue. Additional traffic from new residential developments and minerals development in the Cluster will exacerbate this problem.
- Two major infrastructure projects, close to Cluster 3, the Luton airport expansion and second runway and the widening of the M1 to 4 lanes for 15 miles have implications for the demand for local aggregates from which ever clusters have been identified.
- Rail routes in South Bedfordshire are at close capacity at peak times and recent increases in freight movement has added to these difficulties. Although there are no rail freight handling facilities in the area, any future plans to use rail to move minerals in this area may cause additional problems.
- In Leighton Buzzard plans to build a large housing development on the south-east edge of the settlement in combination with the proposed minerals sites to the south east may potentially have a significant negative effect on local residents and the landscape in the area. Two employment zones are also proposed in the south of Leighton Buzzard, which could further exacerbate impacts.

⁴ Quarry Products Association http://www.qpa.org/pro_fact01.htm

- Previous restoration on cluster 3 minerals sites has been to new housing this is likely to be a possibility for the restoration of newly developed sites in the cluster.

Cluster 4 (Sites in the Upper Ouse Valley)

Significant environmental and social effects for Cluster 4 have been identified for:

Biodiversity and earth science: Cluster 4 sites are located along the River Great Ouse upstream of Bedford. The closest SSSI to the cluster is on the Boundary of MD37 with another SSSI within 1 km of MD46. The Closest NNR is 1.5 km from MD 46. Two of the 5 sites have significant objections from Bedfordshire County Ecologist and English Nature due to their proximity to sensitive SSSI sites (MD46 and 37). Other sites also contain potential wetland habitat that would need careful management. However there are opportunities for restoration of sites into wetland habitat during phased working or after site work completion.

Landscape: All of cluster 4 is in an Area of Great Landscape Value apart from MD19 which is adjacent to the zone on the sites northern boundary. The landscape characteristic for the cluster is landscape character type 3: Limestone river valley with open water, with a strong overall quality. The workings from cluster 4 sites could be visible from a large area but this would be reversible at the end of mineral extraction.

Landtake: About 30% of the cluster 4 sites are identified as being on Agricultural Land Value 1 as identified by DEFRA (part or all of the sites downstream from Radwell). This means that if the site was restored it may not be possible to return sites to this high quality of agricultural land or if these sites were not restored for agricultural use the agricultural amenity of this land would be completely lost which may happen due to changes in landfill regulations See www.qpa.org/pdf/inertfull.pdf on inert wastes.

Human health and amenity: Cluster 4 is located in a rural area to the North West of Bedford, the villages most likely to be negatively impacted by minerals developments are Oakley, Harrold, Carlton, Odell and Felmersham, Stevington, and Bromham. These are likely to be negatively impacted by nuisance issues mainly caused by vehicle movements to the sites this would increase depending on the number of cluster sites developed.

Transportation: Road transport is the most likely form of transportation. The A6 is the closest strategic road route and the strategic route most likely to be used by the mineral sites in the cluster. The A6 is located to the East of the cluster on a North South orientation. However, all of the sites would need to use secondary roads to reach this or other strategic roads. This would have a negative impact on local villages as it is not possible to completely route LGV vehicles away from village roads. MD 18 and 46 are close to a mainline railway however there is no existing loading or unloading facilities for aggregates near the cluster. The River Great Ouse is not navigable in the area of the

cluster due to a number of weirs. A public footpath crosses a cluster 4 site and four footpaths are on site boundaries.

Conservation and protection of water resources: All of cluster 4 apart from MD19 is within the floodplain leading to a significant risk that during flood events part or the majority of minerals production would cease. Climate change predictions identify that flooding may become more common as global temperatures rise. However restoration opportunities could include schemes to store floodwater thus reducing future flooding lower down the River Great Ouse or to provide additional water to the river in drought conditions. The cluster also lies within a Nitrate Vulnerable Zone.

Archaeology and cultural heritage: Around 50% of the cluster sites are within an Area of Archaeological Interest and there is also one ancient monument on the boundary of MD46. There is little information on the overall Archaeological or cultural significance of the cluster, more work for each individual site would be needed to identify this.

Effects in combination with other plans and projects: A review of the Bedford Development Framework Core Strategy and Rural Issues Plan Preferred Option and the Milton Keynes and South Midlands Sub-regional Strategy (March 2005) highlighted the following issues:

- The area of Bedford, Kempston and Northern Marston Vale is proposed as a regional growth zone, with 19,500 new homes to be built by 2021. House building at this scale will require significant minerals resources. To build an average house the Quarry Products Association (QPA) states 60 tonnes⁵ of aggregates is required. This means a total of 1.2 million tonnes will be required to meet this house building target. House building at this scale could potentially also have a negative impact on the area, particularly in terms of increased traffic and other impacts on local residents.
- The Bedford Development Framework states that house building will extend the urban area of Bedford westwards and to the north and north east. Developing minerals in this Cluster will mean that the settlement of Broham will potentially be affected both to the north by minerals development and to the east by housing development.

Conclusions of the Cluster Assessment

The four clusters (just like all of the individual sites within them) have negative environmental impacts, uncertainties, and some positive impacts. Often the cumulative positive impacts for each cluster are in the longer term when minerals work is complete, where strategically planned (at a cluster level) restoration of minerals sites could bring significant benefits to the overall sustainability of the area within and around the cluster.

⁵ Quarry Products Association http://www.qpa.org/pro_fact01.htm

Due to the high density of population in Bedfordshire, all of these mineral developments will need to take place close to Bedfordshire villages and towns. Transport of aggregates will be mainly by road unless rail or waterways can be used and appropriate aggregate loading/unloading facilities built. Large Goods Vehicles (LGV) will be needed to transport minerals from any developed mineral site. These vehicles will often have to pass through villages and towns to reach the mineral sites and their delivery destinations. Some road delivery will still be needed even if rail or water infrastructure is developed to carry some of the minerals.

Future restoration of sites in a cluster may provide the local community with long term sustainability benefits especially if the restoration of sites is considered and planned strategically as a cluster. It should be noted that partial site restoration can occur whilst a minerals site is still active so some potentially negative impacts of a site can be reduced in the medium term and some positive impacts made dependant on the partial restoration chosen. So where are the opportunities for this in Besd?

The potential impacts of partial restoration have not been considered in the medium term effects in this assessment. Partial restoration should be considered for each individual site in a cluster potentially as part of an overall strategy to provide long term positive impacts in the area of the cluster.

APPENDIX 1: ISSUE ASSESSMENT MATRICES

Please see separate appendix document on <http://www.environmentcommunication.co.uk/MWDF-SA.htm>.

APPENDIX 2: SITE ASSESSMENT MATRICES

Please see separate appendix document on <http://www.environmentcommunication.co.uk/MWDF-SA.htm>.

APPENDIX 3: SITE CLUSTER ASSESSMENT MATRICES

Please see separate appendix document on <http://www.environmentcommunication.co.uk/MWDF-SA.htm>.