

Norfolk Minerals and Waste Local Plan

Silica Sand Review of the Minerals Site Specific Allocations DPD

Review of the Minerals and Waste Core Strategy and Development Management Policies DPD

Sustainability Appraisal Report – Part A -Scoping



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Sustainability Appraisal Report – Part A - Scoping

October 2015

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Abbreviations

Acronyms and other abbreviations used in this report are listed below:

| | |
|-----------------------|--|
| AONB | Area of Outstanding Natural Beauty |
| AQMA | Air Quality Management Area |
| BERR | Department for Business, Enterprise and Regulatory Reform |
| BGS | British Geological Survey |
| BMV | Best and Most Versatile (Agricultural Land Classification) |
| BREEAM | Building Research Establishment Environment Assessment Methodology |
| CO₂ | Carbon dioxide |
| CWS | County Wildlife Site |
| DCLG | Department of Communities and Local Government |
| DCMS | Department for Culture, Media and Sport |
| DECC | Department of Energy and Climate Change |
| DEFRA | Department of Environment, Food and Rural Affairs |
| DfT | Department for Transport |
| DPD | Development Plan Document |
| EA | Environment Agency |
| EU | European Union |
| GNDP | Greater Norwich Development Partnership |
| GOS | Government Office for Science |
| HRA | Habitats Regulations Assessment |
| IPCC | Intergovernmental Panel on Climate Change |
| JNCC | Joint Nature Conservancy Council |
| LNR | Local Nature Reserve |
| LSOA | Lower Super Output Area |
| MMO | Marine Management Organisation |
| MSSA | Minerals Site Specific Allocations |
| NCC | Norfolk County Council |
| NMWDF | Norfolk Minerals and Waste Development Framework |
| NNR | National Nature Reserve |
| NPPF | National Planning Policy Framework |
| NPPG | National Planning Practice Guidance |
| SA | Sustainability Appraisal |
| SAC | Special Area of Conservation |
| SEA | Strategic Environmental Assessment |
| SPA | Special Protection Area |
| SPD | Supplementary Planning Document |
| SSSI | Site of Special Scientific Interest |
| SWMP | Surface Water Management Plan |
| UN | United Nations |
| UNECE | United Nations Economic Commission for Europe |
| UNESCO | United Nations Educational, Scientific and Cultural Organisation |
| WCS | Water Cycle Study |
| WSSA | Waste Site Specific Allocations |

Non-Technical Summary

Background

The principles of the planning system for England are set out in the Planning and Compulsory Purchase Act 2004 (as amended by the Localism Act 2010), the National Planning Policy Framework, National Planning Policy for Waste and the National Planning Practice Guidance.

The adopted Norfolk Minerals and Waste Development Framework (NMWDF) consists of the Core Strategy and Minerals and Waste Development Management Policies Development Plan Document (DPD), the Minerals Site Specific Allocations DPD and the Waste Site Specific Allocations DPD which together contain the policies for the development and use of land for minerals extraction and associated development and waste management facilities in Norfolk. These documents form the Local Plan for mineral and waste planning in Norfolk up to the end of 2026.

Under the Planning and Compulsory Purchase Act, there is a requirement for local planning authorities to undertake a Sustainability Appraisal (SA) on its Local Plan. Additionally, in July 2004 an assessment of the effects of certain plans and programmes on the environment, known as Strategic Environmental Assessment (SEA), became a requirement under European Directive 2001/42/EC. This Directive also applies to Local Plans.

In accordance with the Act, the Directive, and Government guidance, a combined SA/SEA was undertaken on the Development Plan Documents within Norfolk's adopted Minerals and Waste Development Framework.

There is a requirement within the NMWDF for a process of annual monitoring and a five yearly review of all the Development Plan Documents. There is also a requirement for a Silica Sand Single Issue Review of the Minerals Site Specific Allocations DPD to be undertaken. An SEA/SA will be undertaken of each review. This Scoping Report is the first stage in this process.

The SA/SEA process follows the requirements of the SEA Directive and Regulations and the National Planning Practice Guidance. This SEA/SA Scoping Report builds on the previous SEA/SA for the Minerals and Waste Site Specific Allocations and Minerals and Waste Core Strategy, to provide an up to date assessment for the Silica Sand Review and the review of the Minerals and Waste Core Strategy in 2016.

This Scoping Report provides an updated outline of the baseline information, key issues, relevant plans and programmes and SA/SEA framework. This report includes the following information:

- Statutory context;
- Influences of other plans and programmes;
- Sustainability baseline information;
- Issues for sustainable development; and
- Sustainability Appraisal Framework.

The purpose of the scoping consultation is twofold, to receive feedback from the relevant environmental bodies and also to inform them as to our SA/SEA activities. Consultation comments will be addressed as much as possible through subsequent stages of both the SA and the development of the Silica Sand Review and the review of the Minerals and Waste Core Strategy.

Policy, Plans and Programmes Review

A review of relevant European, national, regional and local planning policy has been undertaken as part of the SA/SEA process. The review highlights how the Silica Sand Review and the review of the Minerals and Waste Core Strategy can contribute to delivering wider national, regional and local sustainability objectives, whilst ensuring that key environmental protection objectives (such as the EU Wild Birds Directive and EU Habitats Directive) are respected.

The key issues that were identified in the review of relevant policies, plans and programmes included:

- Climate change mitigation and adaption: Reducing contributions to climate change through reduced landfilling, reducing road transportation where practicable, encourage energy efficient buildings and energy from renewable or low carbon sources.
- Improving health and well-being: Ensuring minerals and waste developments do not adversely affect residential amenity through their location and operations. Take into account cumulative impacts. Consider the potential to provide enhancements to public open space, public rights of way and recreation through restoration schemes.
- Protection and enhancement of landscape, the built environment and the historic environment: Ensuring minerals and waste developments are not located in areas that could adversely affect landscape, townscape or heritage assets. Provide enhancement through restoration schemes;
- Protection and enhancement of biodiversity, geodiversity and the natural environment: Ensuring minerals and waste developments and waste management facilities are not located in areas that could adversely affect biodiversity, geodiversity, water quality and soil quality. Provide enhancement through restoration schemes;
- Sustainable resource use: Ensuring minerals and waste resources are used efficiently. Providing sufficient facilities to enable waste to be managed as high up the waste hierarchy as practicable. Consider the location of minerals and waste developments in relation to the markets for the goods and services provided and the suitability of the road network.
- Minimisation of flood risk: Ensuring minerals and waste developments do not increase flood risk and are not situated in areas of high flood risk. Use restoration opportunities to reduce the causes and impacts of flood risk; and
- Supporting local economic growth: Providing a steady and adequate supply of minerals to the economy to support the planned house building, jobs growth and associated infrastructure. Providing sufficient waste management facilities, including waste water treatment capacity to meet the needs of the population and businesses. Plan for a steady and

adequate supply of silica sand. Safeguard known locations of mineral resources and mineral infrastructure.

Sustainability Baseline

The environmental, social and economic baseline for Norfolk was gathered in order to provide a base to predict future baseline evolution, and assess the effects of the Silica Sand Review and the review of the Minerals and Waste Core Strategy. Baseline information collection was based on specific indicators included in the monitoring and implementation framework of the adopted Norfolk Minerals and Waste Plans. Analysis of trends and targets was used to help predict how the baseline might evolve without the implementation of the Silica Sand Review and the review of the Minerals and Waste Core Strategy.

Sustainability Problems and Opportunities

A number of problems and issues were identified from a review of the baseline information which could affect Norfolk and its sustainable development in the future. Key problems and issues included:

Climate change

- Norfolk is predicted to have warmer, drier, summers and wetter warmer winters. Sea level is predicted to rise.
- Carbon dioxide and methane emissions should be reduced from minerals extraction and associated development and waste management facilities by reducing the quantity of biodegradable waste landfilled, reducing road transportation, encouraging energy efficient buildings and the provision of low carbon or renewable energy sources.

Air quality

- Air quality Management Areas are designated in King's Lynn and Norwich due to traffic congestion.
- Minimise air pollution emissions from minerals extraction and associated development and waste management facilities and associated transportation.

Population

- Deprivation is higher in the urban areas of Norwich, Great Yarmouth, King's Lynn and Thetford.
- Increasing population requiring additional housing and associated facilities.
- Need to ensure that minerals and waste developments do not adversely affect the amenity of local communities, through their location and operations, including transport impacts and cumulative impacts.

Historic Environment

- Potential for minerals extraction and associated development and waste management facilities to affect the setting of heritage assets.
- Need to protect and enhance heritage assets through appropriate location and design of minerals and waste developments and restoration schemes.

Biodiversity, flora and fauna

- Problems of land take for development, water pollution affecting nature conservation designations and the loss of finite geodiversity resources.
- Need to protect and enhance habitats, species and geodiversity features as part of minerals and waste development planning, including through restoration schemes.

Landscape

- Gradual loss of countryside, landscape and tranquillity to development.
- The potential for minerals and waste development to impact on the AONB and Heritage Coast as well as landscape character
- Need to protect and enhance the landscape through appropriate location and design of minerals and waste developments, including through restoration schemes.

Human health

- High levels of health deprivation in the urban areas of Norwich, King's Lynn and Great Yarmouth.
- Poor housing quality in parts of Norwich, North Norfolk, King's Lynn and West Norfolk and Breckland.
- Need to ensure that minerals and waste facilities do not exacerbate health deprivation and take into account cumulative impacts.
- Provide enhancement to public open space, public rights of way and recreation through restoration schemes.

Water, soil

- Only a small percentage of the rivers in Norfolk have been classified as good status or better status by the Environment Agency.
- A significant proportion of the county is covered by Groundwater Protection Zones
- Need to preserve Norfolk's best and most versatile (grades 1, 2, or 3a) agricultural land
- Need to ensure that minerals and waste development do not negatively affect surface water quantity or quality or groundwater quantity or quality
- Need to ensure that minerals and waste development does not permanently reduce the proportion of high quality agricultural land.

Material Assets

- Need sufficient facilities to enable waste to be managed as high up the waste hierarchy as practicable and especially reduce the quantity of waste disposed of to landfill.
- Need sufficient facilities to enable waste to be disposed of or, in the case of mixed municipal waste from households, recovered, in line with the proximity principle
 - Variable production of recycled and secondary aggregates
- Declining production of sand and gravel since 2007
- Increasing production of silica sand
- Crushed rock for road building is mainly imported to Norfolk through one railhead in Norwich
- Need to safeguard mineral resources, extraction sites and infrastructure from being sterilised or prejudiced by non-mineral development
- Need to safeguard existing significant waste management facilities from being prejudiced by non-waste development

SA/SEA Framework

The SEA Directive does not specifically require the use of objectives or indicators, but they are a recognised way in which environmental, social and economic effects can be described, analysed and compared. Objectives and indicators were developed based on the development framework objectives; local planning and sustainability objectives, and review of the baseline and key issues for Norfolk.

The 13 sustainability objectives used in the assessment of the three adopted Norfolk Minerals and Waste Development Plan Documents are:

1. To mitigate the effects of climate change by reducing greenhouse gas emissions
2. To improve air quality in line with the National Air Quality Standards
3. To minimise noise, vibration and visual intrusion
4. To improve accessibility and reduce social exclusion
5. To maintain and enhance the character of the townscape and cultural heritage
6. To protect and enhance Norfolk's biodiversity and geodiversity
7. To promote innovative solutions for the restoration and after-use of minerals and waste sites
8. To protect and enhance the quality and distinctiveness of the countryside and landscape
9. To contribute to improved health and amenity of local communities in Norfolk
10. To protect and enhance water and soil quality in Norfolk
11. To promote sustainable use of minerals and waste resources
12. To reduce the risk of current and future flooding at new and existing development
13. To encourage employment opportunities and promote economic growth

These sustainability objectives have been reviewed and it is considered that the minor changes should be made to the objectives for use in the assessment of the Silica Sand Review of the Minerals Site Specific Allocations DPD and the review of the Minerals and Waste Core Strategy. In response to the consultation comments received to the Scoping Report, the following changes will be made to objectives SA1, SA4 and SA5:

1. To adapt to and mitigate effects of climate change by reducing contributions to climate change.
4. To improve accessibility to jobs, services and facilities and reduce social exclusion.
5. To maintain and enhance the character of the townscape and historic environment.

Factors, to be used in scoring each proposed site, area and policy against each SA Objective have been proposed of use in the Silica Sand Review and the Minerals and Waste Core Strategy Review.

Alternatives

Development of the **Silica Sand Review** will go through a number of stages, including a 'Call for Sites', Preferred Options and Draft Plan. Following the publication of the Initial Consultation document, the responses from the public consultation were assessed, and a Call for Sites undertaken in June 2015. Sufficient suitable sites to meet the shortfall were not submitted. Therefore, as proposed in the Initial Consultation document, Norfolk County Council has defined proposed Areas of Search for future silica sand extraction instead and these areas will be subject to Sustainability Appraisal. In deciding on the methodology used to define the areas of search, alternatives were considered regarding which land should be excluded from areas of search. The alternative options used to define the areas of search were consulted on in the Initial Consultation and have also been subject to Sustainability Appraisal.

At the Preferred Options stage the initial assessments of the potential site and the Areas of Search were published for consultation. The initial assessments included a preliminary conclusion regarding the acceptability of the proposed Specific Site or Areas of Search for inclusion in the Silica Sand Review for future silica sand extraction.

The consultation responses from the Preferred Options stage were used to refine the conclusions on which sites would be submitted to the Secretary of State as draft specific site allocations, or areas of search. The draft Silica Sand Review will be published for representations on soundness and legal compliance prior to its submission to the Secretary of State, for examination by an independent Planning Inspector. On adoption, the sites or areas included in the Silica Sand Review for future silica sand extraction will form part of the Minerals Site Specific Allocations Plan.

The **Minerals and Waste Core Strategy Review** will go through a number of stages, including consultation on the preparation of the Review and a formal representations period on the Pre-Submission version of the Minerals and Waste Core Strategy Review. All evidential data supporting the Core Strategy will be reviewed to understand if any changes to policy are required as the result of changing circumstances. A review of wider policy including the National Planning Policy and Planning Practice Guidance for both minerals and waste will also be undertaken.

The consultation responses from the preparation stage will be used to refine the policies to be included in the Pre-Submission version of the document for submission to the Secretary of State. The Minerals and Waste Core Strategy Review will then be published for representations of soundness and legal compliance prior to its submission to the Secretary of State for examination by an Independent Planning Inspector.

Consultation

In accordance with the SEA Directive, Norfolk County Council has carried out a scoping consultation on the Silica Sand Review, and the Minerals and Waste Core Strategy Review with statutory environmental bodies and other key stakeholders, for a six week period in March-April 2015. Consultation comments have been addressed as much as possible through subsequent stages of both the SA/SEA and the development of the Silica Sand Review and will be addressed the Minerals and Waste Core Strategy review.

The Initial Sustainability Appraisal Report -Part A and Part B accompanied the Preferred Options version of the Silica Sand Review for a six-week period of consultation. Comments received in response to this consultation will be taken into account and addressed through the development of the Draft Silica Sand Review, which will form part of the Mineral Site Specific Allocations Plan when adopted.

The Draft Sustainability Appraisal Report will accompany the Draft Silica Sand Review, for a six-week period of consultation. The documents will be sent out to the three statutory consultees; Historic England, Environment Agency, and Natural England, and to other stakeholders and the public. Comments received will be documented, along with a commentary on how these comments were taken on board in relation to modifications to the draft Plan if required.

A separate Initial Sustainability Appraisal Report will accompany the plan preparation stage of the Minerals and Waste Core Strategy Review for a six week period of consultation. Comments received in response to this consultation will be taken into account and addressed through the development of the Pre-Submission version of the Minerals and Waste Core Strategy Review.

A Draft Sustainability Appraisal Report will accompany the Pre-Submission version of the Minerals and Waste Core Strategy Review, for a six week period of consultation. The documents will be sent to the three statutory consultees; Historic England, Environment Agency, and Natural England, and to other stakeholders and the public. Comments received will be documented, along with a commentary on how these comments were taken on board in relation to modifications to the Pre-Submission version of the Minerals and Waste Core Strategy Review if required.

1. Introduction

1.1 Terms of Reference

Under the European Directive 2001/42/EC, on the assessment of the effects of certain plans and programmes on the environment (also known as the 'Strategic Environmental Assessment (SEA) Directive'), and the resulting Environmental Assessment of Plans and Programmes Regulations 2004, a SEA is required to ensure that the environmental effects of the Silica Sand review of the Minerals Site Specific Allocations DPD, and the review of the Minerals and Waste Core Strategy are considered.

Under the Planning and Compulsory Purchase Act and the Town and Country Planning (Local Planning) (England) Regulations 2012, there is also a requirement for local planning authorities to undertake a Sustainability Appraisal (SA) on their Local Plan. This Scoping Report is the first stage in the SEA/SA process.

1.2 Purpose of the Scoping Stage and Scoping Report

The aim of the Scoping Report was to set the context and scope for the SEA/SA of the Norfolk Silica Sand Review of the Minerals Site Specific Allocations Plan and the review of the Norfolk Minerals and Waste Core Strategy. Specifically it aims to:

- Review relevant policies, plans and programmes and their implications for the Silica Sand Review and the Minerals and Waste Core Strategy Review;
- Establish the baseline environmental information and key issues for Norfolk;
- Set the context and objectives of the SEA/SA; and
- Decide on the scope for the SEA/SA, ensuring that it covers all the significant environmental, social and economic effects of the Silica Sand Review and the Minerals and Waste Core Strategy Review.

The Scoping Report was issued for formal consultation to the three statutory consultees (Environment Agency, Natural England and Historic England) and other local stakeholders, and comments made have been incorporated into this report.

1.3 Links with wider studies

Habitats Regulations Assessment

Under the European Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Fauna and Flora (also known as the 'Habitats Directive'), the resulting Conservation of Habitats and Species Regulations 2012, a Habitat Regulations Assessment (HRA) is required where a plan may give rise to significant effects on European designated sites, known as Natura 2000 sites.

Natura 2000 sites consist of Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites, and also include potential SPA (pSPA) and candidate SAC (cSAC). Within Norfolk there are a number of SPAs and

SACs, and therefore a HRA may be required. A HRA Stage 1 'Test of Likely Significance' will be undertaken for the Silica Sand Review and the Minerals and Waste Core Strategy Review to determine whether there are likely to be any significant effects on Natura 2000 sites. If significant effects are determined then a Stage 2 'Appropriate Assessment' will be required. The HRA process will be undertaken in parallel with the SEA/SA and the Silica Sand Review and Minerals and Waste Core Strategy Review processes and will feed into each other.

1.4 Limitations of the Scoping Exercise

Norfolk County Council relied on published data and information provided by others (as well as data obtained by NCC) in the production of the Scoping Report. The information presented in this report is the result of a desk-based review and no formal requests for records have been made.

The baseline information collected in this Scoping Report is the most up-to-date information currently available, however it is possible that conditions described in this report may change over time. It is likely that this dataset will be up-dated throughout the SEA/SA process and for post-adoption monitoring requirements as new information becomes available or other information presents itself. The consultation process aims to identify additional information required to ensure all potential environmental effects have been considered with regard to the Silica Sand Review and the Minerals and Waste Core Strategy Review.

1.5 Structure of the Scoping Report

The Scoping Report is set out as follows:

- Section 1 of this report provides an introduction including background, purpose of the SA Report and SA/SEA limitations;
- Section 2 outlines the legislative context and requirements of SA and SEA and summarises the approach to be taken for the SA/SEA process;
- Section 3 describes the Norfolk Minerals and Waste Development Framework, or Local Plan;
- Section 4 presents the review of relevant plans and programmes and implications for the Silica Sand Review, the review of the Minerals and Waste Core Strategy and SA/SEA (SA/SEA Task A1);
- Section 5 describes the sustainability baseline conditions for Norfolk, and also details the likely evolution of the baseline without the implementation of the Silica Sand Review and the review of the Minerals and Waste Core Strategy (SA/SEA Tasks A2);
- Section 6 details the key problems and issues for Norfolk identified during the baseline review (SA/SEA Task A3);

1.6 Consultation

Previous Consultation Stages

Norfolk County Council's Environment, Development and Transport Committee agreed at its meeting on 16 January 2015 for the Initial Consultation on the Silica Sand Review and the Sustainability Appraisal Scoping Report to be published for a consultation period of six weeks.

The consultee comments and the responses to these made by Norfolk County Council planning officers are contained in the 'Initial Consultation Feedback Report 2015'. This can be found on the County Council's website at: <http://www.norfolk.gov.uk/view/ncc166849>

Norfolk County Council's Environment, Development and Transport Committee agreed at its meeting on 16 October 2015 for the Preferred Options of the Silica Sand Review and the Initial Sustainability Appraisal Report Part A and Part B to be published for a consultation period of six weeks.

The consultee comments and the responses to these made by Norfolk County Council planning officers are contained in the 'Preferred Options Consultation Feedback Report (January 2016)'. This document can be found on the County Council's website at: <http://www.norfolk.gov.uk/nmwdf>

2. Strategic Environmental Assessment and Sustainability Appraisal Legislative Requirements and Approach

2.1 Legislative Requirements

Under the Planning and Compulsory Purchase Act and the Town and Country Planning (Local Planning) (England) Regulations 2012, there is a requirement for local planning authorities to undertake a Sustainability Appraisal (SA) on their Local Plan. In July 2004, Strategic Environmental Assessment (SEA), became a statutory requirement in accordance with EU Directive 2001/42/EC. The objective of the SEA Directive is to provide a high level of protection to the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans with a view to promoting sustainable development. The SEA also works to inform the decision-making process through the identification and assessment of the cumulative significant effects a plan or programme will have on the environment at the strategic level.

In accordance with the Directive, the SEA Regulations and National Planning Practice Guidance, a combined SA/SEA will be undertaken on the Silica Sand Review and the Minerals and Waste Core Strategy review. Guidance on carrying out this SA/SEA will be taken from:

- National Planning Practice Guidance;
- A Practical Guide to the Strategic Environmental Impact Assessment Directive (DCLG, 2006);
- Environmental Assessment of Plans and Programmes Regulations 2004.

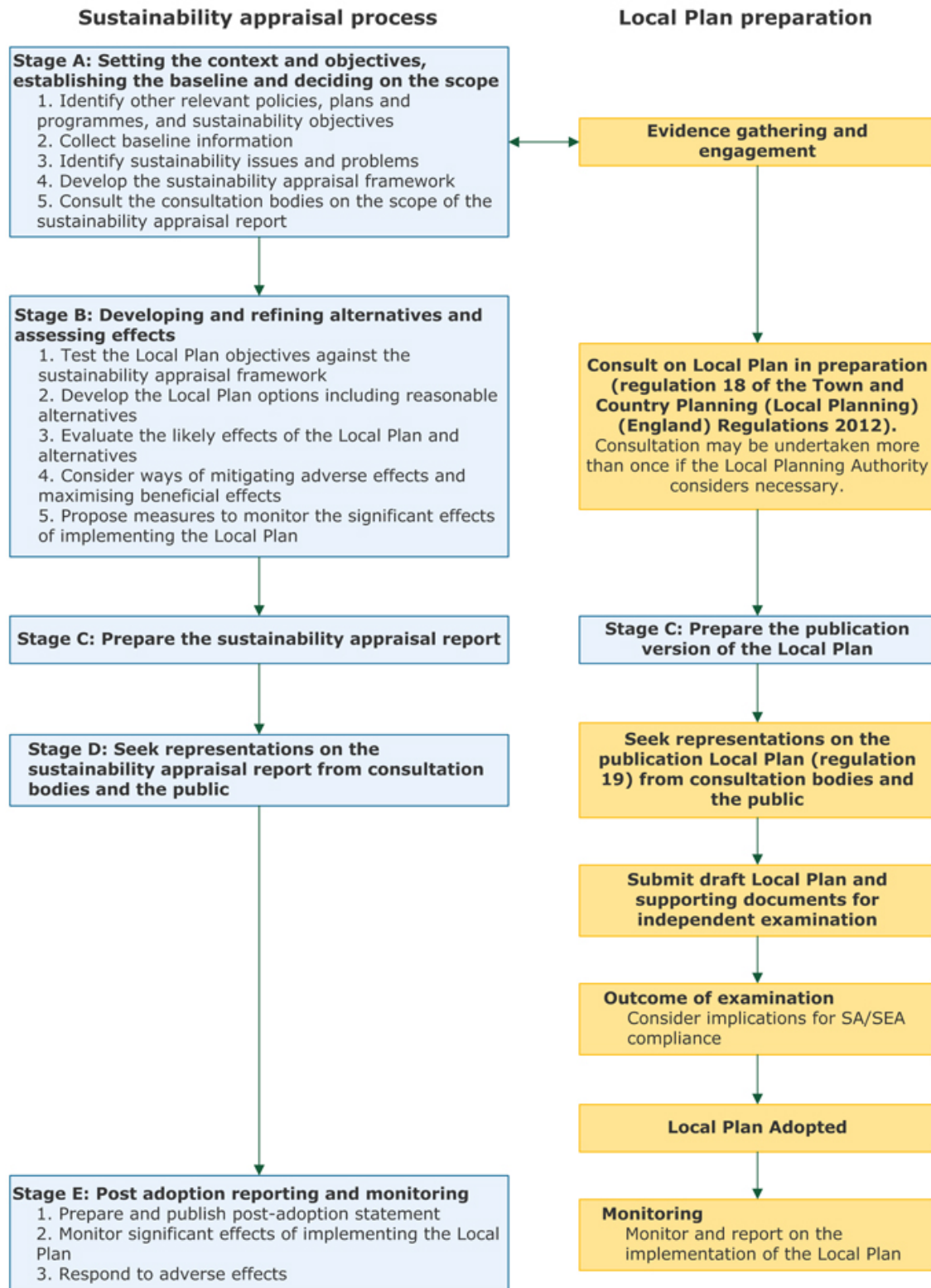
2.2 Approach to the SA/SEA Process

In applying SA/SEA to the Silica Sand Review of the Minerals Site Specific Allocations DPD and the Minerals and Waste Core Strategy Review, Norfolk County Council aims to:

- Identify alternative options for delivering sustainable minerals development in Norfolk;
- Identify alternative options for delivering sustainable waste management facilities in Norfolk;
- Further enhance positive environmental, social and economic effects of the plan; and
- Reduce and minimise the negative environmental, social and economic effects that may result from the implementation of the plan.

To ensure that the SA/SEA is robust and complies with current legislation and best practice, it will follow Stages A-E, identified in the National Planning Practice Guidance:

Figure 2-1: SA/SEA Process



| SA/SEA stage | SA/SEA Task | Task Purpose |
|---|---|--|
| Stage A Setting the context and objectives, establishing the baseline and deciding on the scope | A1: Identifying other relevant plans, programmes and environmental protection objectives | To establish how the plan is affected by outside factors and suggest ideas for how any constraints can be addressed and to help identify SA objectives. |
| | A2: Collecting baseline information | To provide an evidence base for sustainability problems, prediction of effects, and monitoring; to help in the development of SA objectives |
| | A3: Identifying environmental problems | To help focus the SA and streamline the subsequent stages, including baseline information analysis, setting of the SA objectives, predicting of effects and monitoring |
| | A4: Developing SA objectives | To provide a means by which the performance of the plan and alternatives can be assessed |
| | A5: Consulting on the scope of the SA/SEA | To ensure that the SA covers the likely significant effects of the plan |
| Stage B Developing and refining alternatives and assessing effects | B1: Testing the plan objectives against the SA/SEA objectives | To identify potential synergies or inconsistencies between objectives of the plan and SA objectives and help in developing alternatives |
| | B2: Developing strategic alternatives | To develop and refine strategic alternatives |
| | B3: Predicting the effects of the draft plan including alternatives | To predict the significant effects of the plan and alternatives |
| | B4: Evaluating the effects of the draft plan, including alternatives | To evaluate the predicted effects of the plan and its alternatives and assist in the refinement of the plan |

| SA/SEA stage | SA/SEA Task | Task Purpose |
|---|---|--|
| | B5: Considering ways of mitigating adverse effects | To ensure that adverse effects are identified and potential mitigation measures are considered |
| | B6: Proposing measure to monitor the effects of plan implementation | To detail the means by which the performance of the plan can be assessed |
| Stage C Preparing the Sustainability Appraisal Report | C1: Preparing the Sustainability Appraisal Report | To present the predicted effects of the plan, including alternatives, in a form suitable for public consultation and use by decision-makers |
| Stage D Consulting on the draft plan and the Sustainability Appraisal Report | D1: Consulting on the draft plan and Sustainability Appraisal Report | To give the public and consultation bodies an opportunity to express their opinions on the findings of the SA report and to use it as a reference point in commenting on the plan. To gather more information through the opinions and concerns of the public |
| | D2: Assessing significant changes | To ensure that the sustainability implications of any significant changes to the draft plan at this stage are assessed and taken into account |
| | D3: Decision making and providing information | To provide information on how the SA Report and consultees' opinions were taken into account in deciding the final form of the plan to be adopted |
| Stage E Monitoring implementation of the plan | E1: Developing aims and methods for monitoring | To track the effects of the plan to show whether they are as predicted; to help identify adverse effects |
| | E2: Responding to adverse effects | To prepare for appropriate responses where adverse effects are identified |

2.3 Components of the Environmental Report that make up the Sustainability Appraisal Report

The Sustainability Appraisal Reports which will be published alongside the draft Silica Sand Review and the draft Minerals and Waste Core Strategy Review will incorporate the requirements for an Environmental Report, as set out in the National Planning Practice Guidance Ref 11-019-20140306. Table 1 below indicates where specific requirements of the Strategic Environmental Assessment (SEA) Directive will be met.

Table 1: SEA Directive Requirements Checklist

| Environmental Report Requirements | Section of this Report |
|--|--|
| An outline of the contents, main objectives of the plan or programme and relationship with other relevant plans and programmes | Scoping Report – section 3 |
| The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme | Scoping Report – section 5 |
| The environmental characteristics of areas likely to be significantly affected | Scoping Report - sections 5 and 6 |
| Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Directives 79/409/EEC and 92/43/EEC | Scoping Report - Section 6 |
| The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation | Scoping Report - section 4 and Sustainability Appraisal Report- Part B for the relevant draft plan |
| The likely significant effects on the environment, including on issues such as biodiversity, population, human health, fauna, flora, soil, water, air, climatic factors, material assets, cultural heritage including architectural and archaeological heritage, landscape and the interrelationship between the above factors | Sustainability Appraisal Report- Part B for the relevant draft plan |
| The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme | Sustainability Appraisal Report- Part B for the relevant draft plan |
| An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information | Sustainability Appraisal Report- Part B for the relevant draft plan |
| A description of the measures envisaged concerning monitoring in accordance with Article 10 | Sustainability Appraisal Report for the relevant draft plan |
| A non-technical summary of the information provided under the above headings | Start of the Scoping Report and start of Sustainability |

| Environmental Report Requirements | Section of this Report |
|-----------------------------------|---|
| | Appraisal Report-Part B for the relevant draft plan |

2.4 Stage A - Scoping

This report covers Stage A of the SEA process, known as the scoping stage. Stage B for the Silica Sand Review is covered by the Initial Sustainability Appraisal-Part B. Stage B for the Minerals and Waste Core Strategy, and Stages C to D will be covered in the Sustainability Appraisal Reports accompanying the draft Silica Sand Review and the draft Minerals and Waste Core Strategy Review, and Stage E (Monitoring) will be carried out by Norfolk County Council as part of its annual monitoring of the Minerals and Waste Local Plan.

3. Norfolk Minerals and Waste Development Framework Context

3.1 Norfolk Minerals and Waste Development Framework

County councils and unitary authorities have responsibility for minerals and waste planning matters. Norfolk County Council produced a Local Development Framework, known as the Norfolk Minerals and Waste Development Framework (NMWDF). This framework consists of four Planning Policy documents which comprise the minerals and waste planning spatial strategy for the county and form the Minerals and Waste Local Plan.

3.2 Norfolk Core Strategy and Minerals and Waste Development Management Policies Development Plan Document (DPD)

The Core Strategy was the first DPD Norfolk County Council produced as part of the NMWDF. It sets out the vision for minerals and waste development planning in Norfolk for 17 years (from 2010 to 2026) and also contains measurable objectives to enable successful monitoring. The Objectives of the Minerals & Waste Core Strategy are set out overleaf. The Vision for the Minerals & Waste Core Strategy describes how the Council aims to fulfil its responsibility for providing minerals, and managing waste, within the county whilst at the same time taking into account social, economic and environmental sustainability considerations.

The policies contained in the Core Strategy are for use in making decisions on planning applications for mineral extraction and associated development and for waste management development, and in the selection of the Specific Site Allocations, Preferred Areas and Areas of Search for these developments in Norfolk.

The Core Strategy was accompanied by a SEA/SA Report which assessed the negative and positive impacts that the policies may have and proposed mitigation measures where considered appropriate. The Sustainability Appraisal findings formed part of the Examination in Public of the Core Strategy, which was found to be sound and legally compliant in 2011. The Core Strategy was adopted in September 2011. The Core Strategy will be reviewed five years after adoption, in 2016.

The **Minerals and Waste Core Strategy Review** will go through a number of stages, including consultation on the preparation of the Review and a formal representations period on the Pre-Submission version of the Minerals and Waste Core Strategy Review. All evidential data supporting the Core Strategy will be reviewed to understand if any changes to policy are required as the result of changing circumstances. A review of wider policy including the National Planning Policy and Planning Practice Guidance for both minerals and waste will also be undertaken.

The consultation responses from the preparation stage will be used to refine the policies to be included in the Pre-Submission version of the document for submission to the Secretary of State. The Minerals and Waste Core Strategy Review will then be published for representations of soundness and legal compliance prior to its submission to the Secretary of State for examination by an Independent Planning Inspector.

An Initial Sustainability Appraisal Report will accompany the plan preparation stage of the Minerals and Waste Core Strategy Review for a six week period of consultation. Comments received in response to this consultation will be taken into account and addressed through the development of the Pre-Submission version of the Minerals and Waste Core Strategy Review.

A Draft Sustainability Appraisal Report will accompany the Pre-Submission version of the Minerals and Waste Core Strategy Review, for a six week period of consultation. The documents will be sent to the three statutory consultees; Historic England, Environment Agency, and Natural England, and to other stakeholders and the public. Comments received will be documented, along with a commentary on how these comments were taken on board in relation to modifications to the Pre-Submission version of the Minerals and Waste Core Strategy Review if required.

3.3 The Minerals Site Specific Allocations DPD

The Minerals Site Specific Allocations Plan (MSSA) allocates specific sites which are available and acceptable in principle for mineral extraction (sand & gravel, carstone and silica sand) and associated development, to meet the requirements of Core Strategy Policy CS1 until the end of 2026.

The MSSA was accompanied by a SEA/SA Report which assessed the negative and positive impacts that individual sites may have and proposed mitigation measures where considered appropriate. The Sustainability Appraisal findings formed part of the Examination in Public of the MSSA, which was found to be sound and legally compliant in 2013. The MSSA was adopted in October 2013.

The MSSA will be reviewed in full five years from adoption, in 2018. However, there is also a requirement to carry out an early single issue Silica Sand Review of the MSSA. The Silica Sand Review is required because there is a shortfall in the amount of silica sand resource contained within allocated sites compared with the target in Core Strategy Policy CS1. The first consultation stage in the Silica Sand Review process will take place in 2015.

Development of the **Silica Sand Review** will go through a number of stages, including a 'Call for Sites', Preferred Options and Draft Plan. All sites which are submitted by landowners, agents and mineral operators as potential specific site allocations, preferred areas or areas of search will be assessed by officers in consultation with relevant stakeholders and Norfolk County Council's relevant specialist officers (including landscape, ecology, highways and archaeology). Following the publication of the Initial Consultation document, the responses from the public consultation were assessed; and a Call for Sites undertaken in June 2015. Sufficient suitable sites to meet the shortfall were not submitted.

Therefore, as proposed in the Initial Consultation document, Norfolk County Council has defined proposed Areas of Search for future silica sand extraction instead and these areas will be subject to Sustainability Appraisal.

At the current stage (Preferred Options) the initial assessments of the potential Specific Site and the Areas of Search have been published for consultation. The initial assessments include a preliminary conclusion regarding the acceptability of the proposed specific site or Areas of Search for inclusion in the Silica Sand Review for future silica sand extraction.

The consultation responses from the Preferred Options stage were used to refine the conclusions on which sites would be submitted to the Secretary of State as draft specific site allocations, or areas of search. The draft Silica Sand Review will be published for representations on soundness and legal compliance prior to its submission to the Secretary of State, for examination by an independent Planning Inspector. On adoption, the sites or areas included in the Silica Sand Review for future silica sand extraction will form part of the Minerals Site Specific Allocations Plan.

In accordance with the SEA Directive, Norfolk County Council carried out a scoping consultation on the Silica Sand Review, and the Minerals and Waste Core Strategy Review with statutory environmental bodies and other key stakeholders. Consultation comments have been addressed as much as possible through subsequent stages of both the SA/SEA and the development of the Silica Sand Review and the Minerals and Waste Core Strategy review.

The Initial Sustainability Appraisal Report Part A and Part B accompanied the Preferred Options version of the Silica Sand Review for a six-week period of consultation. Comments received in response to this consultation were taken into account and addressed through the development of the Draft Silica Sand Review, which will form part of the Mineral Site Specific Allocations Plan when adopted.

The Draft Sustainability Appraisal Report will accompany the Draft Silica Sand Review, for a six-week period of consultation. The documents will be sent out to the three statutory consultees; Historic England, Environment Agency, and Natural England, and to other stakeholders and the public. Comments received will be documented, along with a commentary on how these comments were taken on board in relation to modifications to the draft Plan if required.

3.4 The Waste Site Specific Allocations DPD

The Waste Site Specific Allocations Plan (WSSA) allocates specific sites which are available and acceptable in principle for waste management facilities, to meet the requirements of Core Strategy Policy CS4, until the end of 2026.

The WSSA was accompanied by an SEA/SA Report which assessed the negative and positive impacts that individual sites may have and proposed mitigation measures where considered appropriate. The Sustainability Appraisal findings formed part of the Examination in Public of the WSSA which was found to be sound and legally compliant in 2013. The WSSA was adopted in October 2013. The WSSA will be reviewed five years from adoption, in 2018.

3.5 Policies Map (previously referred to as a Proposals Map) – accompanies the adopted plans and is designed to act as a visual aid in interpreting the policies in the adopted Plans.

Monitoring these Norfolk Minerals and Waste planning documents is carried out as part of the Norfolk Minerals and Waste Sustainability Appraisal Monitoring Framework, but also through the compliance of planning conditions and potential enforcement cases. The Monitoring Framework will be reviewed as part of the Sustainability Appraisal process for the Silica Sand Review and the Minerals and waste Core Strategy Review.

Table 2: NMWDF Objectives in the adopted Core Strategy

| | |
|---------------|--|
| LDF1 | Ensure steady and adequate provision of primary, and increasingly recycled and secondary, minerals to meet requirements |
| LDF2 | Increase the proportion of waste recycling, composting and energy recovery |
| LDF3 | Minimise the amount of waste sent to landfill |
| LDF4 | Ensure mineral working takes place as close as reasonably possible to where these resources are used, and that waste is treated as close as reasonably possible to where it is generated |
| LDF5 | Increase the use and availability of sustainable transport in accessing waste and minerals facilities |
| LDF6 | Minimise the adverse traffic impacts of material extraction and associated development and waste management facilities |
| LDF7 | Minimise the impact of mineral extraction and associated development and waste management facilities on the environment by promoting opportunities to enhance and protect biodiversity, landscape and geodiversity, water supply, the wider countryside, and cultural heritage |
| LDF8 | Minimise soil and water contamination and flood risk arising from minerals and waste activities |
| LDF9 | Reduce methane and carbon dioxide emissions from mineral extraction and associated development and waste management facilities |
| LDF 10 | Contribute to the Renewables Obligation and regional targets for renewable energy by increasing the proportion of energy recovery from waste |
| LDF 11 | Improve employment opportunities, particularly for those most in need |
| LDF 12 | Ensure that mineral extraction and associated development and waste management facilities and associated transportation do not lead to Air Quality Management Areas and that emissions are reduced |
| LDF 13 | Mitigate adverse impacts on amenity resulting from mineral extraction and associated development and waste management facilities |

4. Task A1: Relationship with Other Relevant Policies, Plans, Programmes and Sustainability Objectives

4.1 Policy Review

A list of relevant policies, plans, programmes and environmental objectives was compiled and analysed for relevance to the Silica Sand Review and the Review of the Minerals and Waste Core Strategy. This analysis allowed the County Council planning officers to take on board how the Silica Sand Review and the Minerals and Waste Core Strategy Review could contribute to delivering wider international, national and local environmental, social and economic objectives.

This chapter of the Scoping Report contains:

- A table of relevant international and European plans, programmes and strategies
- A table of relevant national plans, programmes and strategies
- A table of relevant local plans, programmes and strategies, including plans covering the East of England, Norfolk, local planning authorities in Norfolk and adjacent to Norfolk, minerals and waste planning authorities within the East of England, and mineral plans from minerals planning authorities containing a silica sand resource of glass-sand quality
- A review of the key messages in the relevant international, European, national and local plans, programmes and strategies and an assessment of whether a review of the existing sustainability objectives is required based on the review
- Key issues identified in the review of relevant plans, programmes and strategies that should be taken into account in the Silica Sand Review, the Minerals and Waste Core Strategy Review and in the SA/SEA.

| Table 3: International and European Plans, Programmes and Strategies | | | | | | |
|--|--|--|--|--|---|---|
| Ramsar Convention on Wetlands of International Importance (1971) | UN Framework Convention on Climate Change Copenhagen Accord (2010) | UNECE Convention on Access to information, public participation in decision-making and access to justice in Environmental matters (Aarhus Convention) (1998) | UNESCO World Heritage Convention (1972) | Kyoto Climate Change Protocol (2005) Doha amendment (2012) | Bern Convention on the Conservation of Migratory Species of Wild Animals (1979, amended 1985, 1988) | UNECE Convention on long-range trans-boundary air pollution (1979) as amended by the Gothenburg Protocol to abate acidification, eutrophication and ground-level ozone (1999) |
| Bern Convention on Conservation of European Wildlife & Natural Habitats (1979) | EU Wild Birds Directive (2009) | UN Convention on Biological Diversity (1992) | UN Millennium Declaration (2000) | Rio+20 'Future we want' (2012) | Johannesburg Summit on Sustainable Development (2002) | |
| EU Seventh Environmental Action Plan (2014) | EU Strategic Environmental Assessment Directive 2001/42/EC (2001) | EU Environmental Impact Assessment (2011) | EU Directive on the Assessment and Management of Environmental Noise 2002/49/EC (2002) | EU Biodiversity Strategy to 2020 (2011) | EU Directive on the Conservation of Natural Habitats of wild Flora & Fauna 92/43/EEC (1992) | EU Directive on the Protection of Groundwater (2006) |
| EU Floods Directive (2007) | EU Bathing water Directive (2006) | EU Renewables Directive (2009) | EU Waste Framework Directive 2008/98/EC (2008) | EU Landfill Directive (1999/31/EC) (1999) | EU Directive on the Management of Waste from the Extractive Industries 2006/21/EC (2006) | EU Air Quality Framework Directive – on ambient air quality and management 1996/62/EC |
| EU Transport White Paper (2011) | EU Nitrates Directive (1991) | EU Urban Waste Water Directive (1991) | EU Convention on the Protection of Archaeological Heritage (1972, revised 1992) | EU Sustainable Development Strategy (2006) | EU Spatial Development Perspective (1997) | Council Directive on Ambient Air Quality Limits 1999/30/EC |

| | | | | | | |
|---|---|---|--|--|--|------------------------------------|
| EU Water Framework Directive 2000/60/EC (2000) | EU Marine Strategy Framework Directive (2008) | EU Directive on Ambient Air Quality & Cleaner Air for Europe (2008) | EU Directive on the Incineration of Waste (2000) | EU Directive on the Energy Performance of Buildings (2002) | EU Landscape Convention (Florence Convention) (2004) | EU Clean Air Policy Package (2013) |
| EU Integrated Pollution Prevention & Control Directive 2008/1/EC (2008) | Proposal for a Directive Establishing a Framework for the Protection of Soil (2006) | IPCC's Fifth Assessment report on Climate Change (2013) | EU 2030 Framework for climate and energy (2014) | The Convention on the Protection of Archaeological Heritage of Europe (1985) | | |

| Table 4: National Plans, Programmes and Strategies | | | | | | |
|--|--|---|--|--|--|---|
| Wildlife & Countryside Act (1981) | Climate Change Act (2008) | Planning Act (2008) | Localism Act (2011) | Countryside & Rights of Way Act (2000) | Control of Pollution Act (1974) as amended | The Extractive Industries – 6 th Report (Select Committee for BIS, 2014) |
| Flood & Water Management Act (2010) | Marine & Coastal Act (2009) | Environment Act (1995) | Environmental Protection Act (1990) | Natural Environment & Rural Communities Act (2006) | Planning and Compulsory Purchase Act (2004) | UK Air Quality Standard Regulations (2010) |
| National Planning Policy Framework (DCLG, 2012) | National Planning Practice Guidance (DCLG, 2014) | Conservation of Habitats & Species Regulations (2010) | Water Environment Regulations (2003) | UK Marine Policy Statement (2011) | Environmental Permitting Regulations (2010, amended 2012) | Government Forestry and Woodlands Policy Statement (DEFRA, 2013) |
| The Waste Regulations (2011, amended 2012) | The Hazardous Waste Regulations (2005, amended) | Ancient Monuments & Archaeological Areas Act (1979) | The UK Post 2010 Biodiversity Framework, (DEFRA, 2012) | The Wetland Vision for England (EA, 2008) | Groundwater Protection: Policy & Practice (EA, 2012) | The Government's Statement on the Historic Environment for England (DCMS, 2010) |
| Healthy Lives, Healthy People: strategy for Public Health in England (Dept. of Health, 2010) | Government Review of Waste Policy in England (DEFRA, 2011) | UK Sustainable Development Strategy (ODPM, 2005) | Mainstreaming Sustainable Development (DEFRA, 2011) | Agricultural Waste Regulations (2006) | Anaerobic Digestion strategy and Action Plan (DEFRA, 2011) | National Infrastructure Plan (HM Treasury, 2014) |
| Rural Statement (DEFRA, 2012) | Safeguarding our Soils (DEFRA, 2011) | The Natural Choice – Securing the Value of Nature (DEFRA, 2011) | National Adaptation Programme (DEFRA, 2012) | Biodiversity 2020 (DEFRA, 2011) | New Anglia: Growth Deal (ODPM, 2014) | Groundwater Protection: Policy and Practice (EA, 2013) |

| | | | | | | |
|---|---|--|--|--|---|--|
| Government Forestry & Woodlands Policy Statement (DEFRA, 2013) | The Carbon Plan (DECC, 2011) | Good Practice Guide for Tourism (DCLG, 2006) | English National Parks & the Broads (DEFRA, 2010) | Waste Prevention Programme for England (2013) | East Inshore and East Offshore Marine Plan (MMO, 2013) | Historic Environment GPA in Planning Note 1: The Historic Environment in Local Plans (Historic England, 2015) |
| Biodiversity Indicators in Your Pocket (DEFRA, 2010) | UKNEA National Ecosystem Assessment (2011) | Model Procedures for the Management of Contaminated Land (DEFRA/EA, 2004) | England Biodiversity Strategy Climate Change Adaptation Principles (DEFRA, 2008) | Climate Change & biodiversity Adaption (Natural England, 2009) | The Air Quality Strategy for England, Scotland, Wales and Northern Ireland) 2007, 2011) | Historic Environment GPA Note 2: Managing Significance in Decision-taking (Historic England, 2015) |
| Climate Change Risk Assessment (DEFRA, 2012) | Carbon Budget Order (DECC, 2011) | The renewable energy roadmap update (DECC, 2012) | Energy Act (2013) | Microgeneration Strategy (DECC, 2011) | UK Bioenergy Strategy (DECC, 2012) | Historic Environment GPA Note 3: The Setting of Heritage Assets (Historic England, 2015) |
| National Planning Policy for Waste (DCLG, 2014) | UK Bioenergy Strategy (DECC, 2012) | Heritage protection for the 21 st Century (DCMS, 2007) | Creating Growth, Cutting Carbon, making Sustainable transport happen (DfT, 2011) | Expanding and Improving the Rail Network (DfT, 2012) | The Broads Act (1988) | Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural Land (Natural England, 2012) |
| Low Emissions Strategies: Using the Planning System to reduce transport emissions (DEFRA, 2010) | Geological conservation review (JNCC, 1977 onwards) | Strategy for the Management of solid LLRW from the Non-Nuclear Industry (DECC, 2010) | Low Carbon Transport: A Greener Future (DfT, 2009) | Managing Aggregates Supply in England (OR/08/042) (BGS, 2008) | Strategy for Sustainable Construction (BERR, 2008) | The Future of Food & Farming: Challenges and Choices for Global Sustainability (GOS, 2011) |

| | | | | | | |
|---|---|--|---|---|--|--|
| Civil Engineering Environmental Quality Assessment Award Scheme | Building Research Establishment Assessment Method | World Class Places: The Government's Strategy for Improving Quality of Places (2009) | National and regional Guidelines for Aggregates Provision in England 2005-2020 (DCLG, 2009) | By all Reasonable Means: Inclusive Access to the Outdoor for Disabled People (Countryside Agency, 2005) | Red Tape Challenge – Environment Theme Proposals (DEFRA, 2012) | Waste Management Plan for England (2013) |
| Climate Change Adaptation by Design (Town & Country Planning Association, 2007) | Planning for Climate Change (Town & Country Planning Association, 2012) | England's statutory landscape designations: a practical guide to your duty of regard (Natural England, 2010) | Fracking UK shale: planning permission and communities (DECC, 2014) | Shale Gas: made simple (DECC, 2014) | Developing Onshore Shale Gas and Oil – Facts about 'Fracking' (DECC, 2013) | Fracking UK shale: climate change (DECC, 2014) |
| Fracking UK shale: local air quality (DECC, 2014) | Fracking UK shale: regulation and monitoring (DECC, 2014) | Fracking UK shale: safety from design to decommissioning (DECC, 2014) | Fracking UK shale: understanding earthquake risk (DECC, 2014) | Fracking UK shale: water (DECC, 2014) | Background note on shale gas and hydraulic fracturing (DECC, 2014) | Onshore oil and gas exploration in the UK: regulation and best practice (DECC, 2013) |
| Planning (Listed Buildings and Conservation Areas) Act (1990) | Conservation Principles, Policy and Guidance (Historic England, 2008) | | | | | |

| Table 5: Local Plans, Programmes and Strategies | | | | | | |
|--|---|---|---|--|--|--|
| Breckland Council | | | | | | |
| Breckland Core Strategy (2009) | Breckland Site Specific Policies and Proposals DPD (2012) | Thetford Area Action Plan DPD (2012) | Breckland Integrated Delivery Document 2010 | Breckland Stage 1 Water Cycle Study (2008) | Breckland Water Cycle Study Stage 2 (2010) | Water Cycle Study Stage 2 – Attleborough Findings (2010) |
| Breckland Council – Strategic Flood Risk Assessment (June 2005) Breckland SFRA 2007 Update (Feb 2008) | Breckland Core Strategy Infrastructure Study (Attleborough Findings) (2008) | Attleborough Strategic Masterplan, 2011 | Breckland District, Landscape Character Assessment, May 2007 (Land Use Consultants) | Breckland Environment Strategy 2008-2013 | Securing Biodiversity in Breckland: First Report of the Breckland Biodiversity Audit (2010) | Further assessments of the relationship between buildings and stone curlew distribution (2013) |
| Broadland District Council | | | | | | |
| Broadland District Council - Development Management DPD (2015) | Broadland District Council - Site Allocations DPD (<i>submitted 2014</i>) | Broadland District Council - Growth Triangle Area Action Plan (<i>submitted 2015</i>) | Broadland landscape Character Assessment SPD (2013) | Broadland Rivers Catchment Flood Management Plan (Environment Agency) (2009) | Norwich Clinical Commissioning Group Health and Wellbeing Strategy 2013-2018 (<i>covers Norwich & part of Broadland</i>) | |
| Broads Authority | | | | | | |
| Broads Authority Core Strategy DPD (2007) | Broads Development Management Policies DPD (2011) | Broads Site Specifics Local Plan (2014) | Broads Authority Development and Flood Risk SPD (2008) | Broads Authority Biodiversity Action Plan and Framework (2009) | Broads Landscape Character Assessment (2006) updated 2012 | Broads Authority Strategic Flood Risk Assessment (2007) |
| Broads Landscape Sensitivity Study for Renewables and Infrastructure (2012) | The Broads Plan (2011) | | | | | |

| Greater Norwich Development Partnership | | | | | | |
|---|--|---|--|---|--|--|
| Greater Norwich Development Partnership Joint Core Strategy for Broadland, Norwich, and South Norfolk (2011 & 2014) | GNDP Green infrastructure Strategy (2007) and Delivery Plan (2009) | GNDP Greater Norwich Economic Strategy (2009-2014) | Partnership of Norfolk Authorities SFRA (2008) (Broadland, Norwich City, South Norfolk, Broads Authority, North Norfolk) | Norwich Urban Area Surface Water Management Plan (2011) (NCC, Norwich City, Broadland, South Norfolk) | Norwich Area Transportation Strategy (NCC) (2006) | Norwich Area Transportation Strategy Implementation Plan update (NCC) (2013) |
| Great Yarmouth Borough Council | | | | | | |
| Great Yarmouth Borough Core Strategy Local Plan (2015) | Great Yarmouth Borough-wide Local Plan 'saved' policies (2001) | Great Yarmouth and Waveney Water Cycle Scoping Study (2009) | Great Yarmouth landscape character assessment (2008) | Essex and Suffolk Water – Water Resources Management Plan 2015-2040 (2014) | Great Yarmouth Strategic Flood Risk Assessment (2009) | Great Yarmouth Borough Surface Water Management Plan (NCC, GYBC) (2014) |
| Borough Council of King's Lynn and West Norfolk | | | | | | |
| King's Lynn and West Norfolk Core Strategy (2011) | King's Lynn and West Norfolk Site Allocations and Development Management Policies (Submitted 2015) | Strategic Flood Risk Assessment (BC KL&WN) 2007 (addendum 2009) | Infrastructure Study (BC KL&WN) (2015) | Green Infrastructure Study and Management Plan (BC KL&WN) (2009) | Gaywood Clock Air Quality Management Area (2009) | Railway Road Air Quality Management Area (2007) |
| Outline Water Cycle Study Phase One (BC KL&WN) (2009) | Water Cycle Study Phase Two (BC KL&WN) (2011) | Great Ouse Catchment Flood Management Plan (EA, 2009) | Economic Strategy (BC KL&WN) (2009) | The Wash Shoreline Management Plan (2010) | King's Lynn Settlements Surface Water Management Plan (NCC, BCKLWN) (2015) | |

| North Norfolk District Council | | | | | | |
|---|--|---|--|--|---|--|
| North Norfolk Core Strategy incorporating Development Control Policies (2009) | North Norfolk Site Allocations DPD (2011) | North Norfolk landscape Character Assessment SPD | North Norfolk Shoreline Management Plan (2011) | North Norfolk Design Guide SPD (2008) | Kelling to Lowestoft Ness Shoreline Management Plan (2010) | |
| Norwich City Council | | | | | | |
| Norwich City Development Management Policies Local Plan (2014) | Norwich City Site Allocations and site specific policies Local Plan (2014) | A New Vision for Norwich - The Sustainable Community Strategy 2008-2020 (City of Norwich Partnership) | Norwich City Council Environmental strategy 2011-2014 | Norwich City Council Local Air Quality Management – Detailed Assessment 2012 | Norwich City Council Strategic Flood Risk Assessment Level 2 (2010) | Biodiversity Action Plan for the City of Norwich (2002) |
| South Norfolk Council | | | | | | |
| South Norfolk Development Management Policies Document (2015) | South Norfolk Site Specific Allocations and Policies Document (2015) | Wymondham Area Action Plan (2015) | Long Stratton Area Action Plan (examined in 2015) | South Norfolk place-Making Guide SPD (Sept 2012) | South Norfolk Landscape Assessment 2001 | South Norfolk Local Landscape Designations Review (2012) |
| Norfolk Adopted Neighbourhood Plans | | | | | | |
| Acle (2015) | Great Plumstead, Little Plumstead and Thorpe End Garden Village (2015) | Sproston (2014) | Strumpshaw (2014) | Cringleford (2014) | Brancaster Neighbourhood Plan (2015) | South Wootton Neighbourhood Plan (2015) |
| Local Listing of Heritage Assets | | | | | | |
| Local Listed Heritage Assets (North Norfolk District Council) | Local Listed Heritage Assets (Norwich City Council) | Local Listed Heritage Assets (Broads Authority) | Conservation Area Appraisals (Borough Council of King's Lynn and West Norfolk) | Conservation Area Appraisals (Broadland District Council) | | |

| Norfolk Wide plans | | | | | | |
|---|---|---|---|--|---|---|
| Delivering Economic Growth in Norfolk – the strategic Role for Norfolk County Council 2012-2017 | Norfolk Ambition - Sustainable Community Strategy for Norfolk 2003-2023 | Norfolk's Earth Heritage – valuing our Geodiversity (Norfolk Geodiversity Partnership) (2010) | Norfolk Geodiversity Action Plan 2011-2016 (Norfolk Geodiversity Partnership) | Biodiversity Supplementary Planning Guidance for Norfolk (NCC, 2004) | Tomorrows Norfolk, Today's Challenge – A climate change strategy for Norfolk (2008) | Connecting Norfolk, Norfolk's Transport Plan for 2026 (LTP3) NCC 2011 |
| Norfolk Rural Development Strategy 2013-2020 (NCC & Norfolk Rural Development Strategy Steering Group) (2013) | Norfolk Infrastructure Plan (Norfolk CC) (2012) | Norfolk Geodiversity Partnership site audit (2009) | Joint Municipal Waste Management Strategy for Norfolk 2006-2020 | Norfolk Biodiversity Partnership – habitats and Species Action Plans | Norfolk Coast AONB Management Plan Strategy 2014-2019 (Norfolk Coast Partnership) | Connecting Norfolk Implementation Plan 2011-2015 (NCC) (2011) |
| Norfolk Core Strategy and Minerals and Waste Development Management Policies DPD 2010-2026 (2011) | Norfolk Waste Site Specific Allocations DPD (2013) | Norfolk Minerals Site Specific Allocations DPD (2013) | Water Resources Management Plan 2015 (Anglian Water, 2014) | Local Economic Assessment for Norfolk – Sept 2013 update (NCC) | Norfolk's Local Flood Risk Management Strategy (NCC) (2015) | |

| East of England Plans | | | | | | |
|--|---|---|---|--|--|---|
| Realising the benefits of trees, woods and forests in the East of England - A Woodland for life Publication (2011) | Water for life and livelihoods. River Basin management Plan, Anglian River basin District (DEFRA and EA 2009) | Water resources strategy: regional action plan for the Anglian Region (Environment Agency) (2009) | New Anglia Local Enterprise Partnership for Norfolk and Suffolk: Strategic Economic Plan (2014) | Greater Cambs/ Greater Peterborough Enterprise Partnership: Strategic Economic Plan (2014) | Heritage Counts 2014 –East of England (English Heritage) | East of England Aggregate Working Party – Annual Monitoring Report 2012 (2013) |
| East of England Authorities' Minerals and Waste Plans & adjacent Minerals and Waste Plans | | | | | | |
| Essex Minerals Local Plan (2014) | Essex County Council & Southend-on-Sea Waste Local Plan (2001) | Thurrock Core Strategy and Policies for Management of Development (2011) | Hertfordshire Waste Core Strategy and Dev. Management Policies Document (2012) | Hertfordshire Minerals Local Plan (2007) | Hertfordshire Waste Site Allocations (2014) | Suffolk County Council - Minerals Core Strategy DPD (2008) |
| Suffolk County Council - Minerals Site Specific Allocations DPD (2009) | Suffolk County Council - Waste Core Strategy (2011) | Cambridgeshire and Peterborough Minerals and Waste Core Strategy (2011) | Cambridgeshire and Peterborough Minerals and Waste Site Specific Proposals Plan (2012) | Bedford, Luton & Central Beds Authorities - Minerals & Waste Local Plan: Strategic Sites and Policies (2014) | Bedford, Luton & Central Beds Authorities - Minerals T.E.P. 4: silica sand reserves and recent production (2011) | Minerals Technical Evidence Paper 2: Bedfordshire Silica Sand Study 2006/7 (Cuesta Consulting Limited) (2008) |
| Bedfordshire & Luton Minerals and Waste Local Plan 'saved' policies (2005) | Lincolnshire Minerals Local Plan 'saved' policies (1991) | Lincolnshire Waste Local Plan (2006) | | | | |

Note that the following relevant plans have not reached the pre-Submission Publication stage and therefore are NOT currently included in the SA table: Essex CC & Southend-on-Sea Replacement Waste Local Plan – *currently at plan preparation stage in 2014*

| Adjacent to Norfolk - District Councils' Plans | | | | | | |
|--|---|---|---|--|---|---|
| Forest Heath Core Strategy (2010) | Forest Heath and St Edmundsbury Joint Dev Management Policies Document (<i>at examination stage Nov 2014</i>) | Fenland Local Plan (2014) | East Cambridgeshire Core Strategy (2009) | Local Plan for East Cambs (in examination in Nov 2014) | The approach to future development in Waveney -Core Strategy (2009) | Waveney District Council - Site Specific Allocations (2011) |
| Waveney District Council - Development Management Policies (2011) | South Holland Local Plan (saved policies) (2006) | | | | | |
| Silica sand authorities located outside of the East of England | | | | | | |
| Surrey Minerals Plan Core Strategy DPD and Primary Aggregates DPD (2011) | Cheshire West and Chester Local Plan (Part one)(2015) | Cheshire County Council – Replacement Minerals Local Plan 'saved' policies (1999) | North Yorkshire Minerals Local Plan 'saved' policies (1997) | North Lincolnshire Local Plan 'saved' policies (2003) | Cheshire East Local Plan (<i>at examination October 2015</i>) | Lincolnshire Minerals and Waste Local Plan – Core Strategy and Development Management Policies (<i>at examination October 2015</i>) |

Glass silica sand only – other authorities with non-glass silica sand resources are not included

- Note that the following relevant plans have not reached the pre-Submission Publication stage and therefore are NOT currently included in the SA table: Cheshire West and Chester Local Plan (part 2) Land allocations and detail policies (*SA scoping update –Oct 2015*)
- North Lincolnshire Minerals and Waste DPD (*at plan preparation stage - no published documents by October 2015*)
- North Yorkshire CC, City of York & North York Moors National Park Minerals & Waste Joint Plan (*Preferred Options Nov 2015*)
- Lincolnshire Minerals & Waste Local Plan (Site Locations) (*at preparation stage in 2015*)
- South East Lincolnshire Local Plan (Boston Borough & South Holland) (*in preparation October 2015*)
- Forest Heath -Single Issue Review and Site Specific Allocations (*Further Issues and Options Consultation August 2015*)

Table 6: Key messages in the review of policies, plans and programmes linked to existing SA and LDF objectives

| LDF Objectives | SA Objectives | Key Messages in sources | Main Sources |
|--|--|---|---|
| <p>LDF9: Reduce methane and carbon dioxide emissions from mineral extraction and associated development and waste management facilities</p> | <p>SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change</p> | <p>Reduce contribution to climate change and ensure people, the built and natural environments can adapt to the changing climate.</p> <p>Move to a low carbon future through encouraging:</p> <ul style="list-style-type: none"> - Energy efficient buildings - New development to provide a decentralised energy supply unless it can be demonstrated to not be feasible or viable - promote energy from renewable and low carbon sources | <ul style="list-style-type: none"> • Kyoto Climate Change Protocol • UN Framework Convention on Climate Change Copenhagen Accord • Climate Change Act 2008 • EU Sixth Environmental Action Programme • The Carbon Budget Order 2009 • The Carbon Plan • Planning for Climate Change – Guidance for Local Authorities • The Natural Choice: Securing the Value of Nature • Mainstreaming Sustainable Development – the Government’s Vision and What this Means in Practice • England Biodiversity Strategy Climate Change Adaptation Principles • Climate Change and Biodiversity Adaptation: The Role of the Spatial Planning System • Climate Change Risk Assessment • Climate Change Adaptation by Design • National Adaptation Programme • The Future of Food and Farming: Challenges and Choices for Global Sustainability • Low Carbon Transport: A Greener Future • Tomorrows Norfolk, Today’s Challenge – A climate change strategy for Norfolk (2008) • Realising the benefits of trees, woods and forests in the East of England - A Woodland for life Publication (2011) • Norwich City Council Environmental strategy 2011-2014 • Breckland Environment Strategy 2008-2013 <ul style="list-style-type: none"> • Fracking UK shale: climate change (DECC, 2014) |

| LDF Objectives | SA Objectives | Key Messages in sources | Main Sources |
|--|--|--|---|
| | | <p>Reduce emissions to air from transport through using sustainable modes of transport, such as rail for bulk minerals and waste movements where practicable.</p> <p>Protect existing infrastructure (rail heads and wharfs) that enable alternative transport to be used.</p> <p>Assess the capacity of existing and potential transport infrastructure to ensure new development does not increase traffic congestion.</p> | <ul style="list-style-type: none"> • Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen, • Low Carbon Transport: A Greener Future, • Low Emissions Strategies, • Expanding and Improving the Rail Network, • Norwich Area Transportation Strategy (NCC) (2006) • Norwich Area Transportation Strategy Implementation Plan update (NCC) (2013) • Long Stratton Area Action Plan (pre-submission in October 2014) • Connecting Norfolk, Norfolk’s Transport Plan for 2026 (LTP3) NCC 2011 • Connecting Norfolk Implementation Plan 2011-2015 (NCC) (2011) • Norwich City Council Local Air Quality Management – Detailed Assessment 2012 • Gaywood Clock Air Quality Management Area (2009) • Railway Road Air Quality Management Area (2007) <p>The Local Plans and DPDs produced by Local Planning Authorities and listed under SA Objective SA13 also contain policies regarding climate change.</p> |
| <p>LDF12: Ensure that mineral extraction and associated development and waste management facilities and associated transportation do not lead to Air Quality Management</p> | <p>SA2: To improve air quality in line with the National Air Quality Standards</p> | <p>Ensure development proposals do not result in unacceptable air pollution.</p> <p>Minimise emissions to air from minerals extraction and associated development and waste management facilities and associated transportation.</p> <p>Ensure that no new Air Quality Management Areas are declared as a result of minerals extraction and associated development or waste management facilities.</p> | <ul style="list-style-type: none"> • Directive on Ambient Air Quality and Cleaner Air for Europe (2008/50/EC) • EU Integrated Pollution and Prevention and Control (IPPC) Directive (2008/1/EC) • NPPF • Environmental Permitting Regulations 2010 • Control of Pollution Act 1974 (as amended) <ul style="list-style-type: none"> • Fracking UK shale: local air quality (DECC, 2014) • Environmental Protection Act, 1990 • Environment Act 1995 • The Air Quality Strategy for England, Scotland, Wales, and Northern Ireland • Gaywood Clock AQMA, King’s Lynn (2009) • Railway Road Air Quality Management Area, King’s Lynn (2007) |

| LDF Objectives | SA Objectives | Key Messages in sources | Main Sources |
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| Areas and that emissions are reduced | | | <ul style="list-style-type: none"> • Norwich City Council Local Air Quality Management – Detailed Assessment 2012 • Norwich City Council Environmental strategy 2011-2014 • Norwich Area Transportation Strategy (NCC) (2006) • Norwich Area Transportation Strategy Implementation Plan update (NCC) (2013) • Long Stratton Area Action Plan (pre-submission in October 2014) • Connecting Norfolk, Norfolk’s Transport Plan for 2026 (LTP3) NCC 2011 • Connecting Norfolk Implementation Plan 2011-2015 (NCC) (2011) <p>The Local Plans and DPDs produced by Local Planning Authorities and listed under SA Objective SA13 also contain policies regarding air quality.</p> |
| <p>LDF6 Minimise the adverse traffic impacts of material extraction & waste management facilities</p> <p>LDF13 Mitigate adverse impacts on amenity resulting from mineral extraction & waste management facilities</p> | SA3: To minimise noise, vibration and visual intrusion | <p>Limit the impacts of minerals and waste development on amenity through appropriate site locations, site operations and management. Taking into account the location of sensitive receptors and suitable mitigation measures.</p> <p>Take into account cumulative effects of multiple impacts from individual sites and/or a number of sites in the locality.</p> | <ul style="list-style-type: none"> • Rio + 20 ‘Future we Want’ • NPPF • National and regional guidelines for aggregates provision in England • Norfolk Core Strategy and Minerals and Waste Development Management Policies DPD 2010-2026 (2011) • Norfolk Waste Site Specific Allocations DPD (2013) • Norfolk Minerals Site Specific Allocations DPD (2013) • South Norfolk Landscape Assessment 2001 • South Norfolk Local Landscape Designations Review (2012) • Breckland District, Landscape Character Assessment, May 2007 (Land Use Consultants) • Broadland landscape Character Assessment SPD (2013) • Broads Landscape Character Assessment (2006) updated 2012 • Great Yarmouth landscape character assessment (2008) • North Norfolk landscape Character Assessment SPD • North Norfolk Design Guide SPD (2008) • South Norfolk place-Making Guide SPD (Sept 2012) • Norfolk Coast AONB management strategy 2009-2014 (Norfolk Coast Partnership) |

| LDF Objectives | SA Objectives | Key Messages in sources | Main Sources |
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| <p>LDF11 Improve employment opportunities, particularly for those most in need</p> | <p>SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion</p> | <p>Protect open space for community benefit.</p> <p>Consider the potential for public use and access in restoration proposals for mineral extraction sites.</p> <p>Protect and enhance public rights of way.</p> <p>Ensure safe and suitable transport access to minerals and waste sites can be achieved for employees and customers</p> <p>Take into account cumulative effects of multiple impacts from individual sites and/or a number of sites in the locality.</p> | <ul style="list-style-type: none"> • NPPF • Healthy Lives, Healthy People: Our strategy for public health in England (2010) • Natural Choice: Securing the Value of Nature • English National Parks & the Broads 2010 • Good Practice Guide for Tourism 2006 • Realising the benefits of trees, woods and forests in the East of England - A Woodland for life Publication (2011) • A New Vision for Norwich - The Sustainable Community Strategy 2008-2020 (City of Norwich Partnership) • Norwich Area Transportation Strategy (NCC) (2006) • Norwich Area Transportation Strategy Implementation Plan update (NCC) (2013) • Long Stratton Area Action Plan (pre-submission in October 2014) • Connecting Norfolk, Norfolk's Transport Plan for 2026 (LTP3) NCC 2011 • Connecting Norfolk Implementation Plan 2011-2015 (NCC) (2011) <p>The Local Plans and DPDs produced by Local Planning Authorities and listed under SA Objective SA13 also contain policies regarding accessibility and social exclusion.</p> |
| <p>LDF7: Minimise the impact of mineral extraction and associated development and waste management facilities on the environment</p> | <p>SA5: To maintain and enhance the character of the townscape and historic environment</p> | <p>Protect and enhance historic and archaeological features to conserve the historic environment and maximise the economic impact of heritage.</p> <p>Take into account the contribution made by the setting of the heritage asset to the significance of that heritage asset.</p> <p>Engage people in assets of historical, architectural interest and townscapes, including world heritage sites, listed buildings,</p> | <ul style="list-style-type: none"> • EU Convention for the Protection of the Archaeological Heritage of Europe (Granada Convention, Valetta Convention), • UNESCO World Heritage Site Convention, • European Landscape Convention (Florence Convention) • Heritage Protection for the 21st Century • Ancient Monuments and Archaeological Areas Act 1979, • NPPF • Historic Environment GPA in Planning Note 1 (Historic England) • Historic Environment GPA in Planning Note 2 (Historic England) • Historic Environment GPA in Planning Note 3 (Historic England) • South Norfolk Place-Making Guide SPD (Sept 2012) • Heritage Counts 2014 – East of England (English Heritage) |

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| <p>by promoting opportunities to enhance and protect biodiversity, landscape and geodiversity, water supply, the wider countryside, and cultural heritage</p> | | <p>conservation areas, archaeologically important locations and historically important landscapes.</p> | <p>The Local Plans and DPDs produced by Local Planning Authorities and listed under SA Objective SA13 also contain policies regarding design, the protection and enhancement of the townscape and cultural heritage.</p> |
| | <p>SA6: To protect and enhance Norfolk's biodiversity and geodiversity</p> | <p>Protect and enhance biodiversity, including sites of nature conservation importance designated at a European, national and local level and protected species.</p> <p>Protect coastal landscapes and biodiversity.</p> <p>Avoid fragmentation of priority habitats and seek to enhance the permeability of land cover for species movement at a landscape scale.</p> <p>Halt the loss of biodiversity and create better habitat networks. Deliver a net-gain in biodiversity. Protect and enhance geological diversity.</p> <p>Recognise and enhance the natural capital provided by natural, semi natural and managed habitats and ecosystems to maintain flows of ecosystem services, such as food, water, flood control and recreation.</p> <p>Allocate land with the least</p> | <ul style="list-style-type: none"> • Ramsar Convention • UN Convention on Biological Diversity • Bern Convention on the conservation of • European Wildlife and Natural Habitats, Bonn Convention on the Conservation of Migratory Species and Wild Animals • EU Sixth Environmental Action Plan • European Sustainable Development Strategy • EU Habitats Directive (92/43/EEC) and EU Birds Directive (2009/147/EC) • Rio + 20 'Future we Want' • Wetlands Vision for England, • Biodiversity Indicators in your Pocket • Natural Environment and Rural Communities Act 2006, • National Ecosystem Assessment • Conservation of Habitats and Species Regulations 2010 • Wildlife and Countryside Act 1981 • The Natural Choice: Securing the Value of Nature • Biodiversity 2020 • England Biodiversity Strategy • Climate Change Adaptation Principles • National Parks Circular • NPPF • Mainstreaming Sustainable Development – the Government's Vision and What this Means in Practice • UK Post-2010 Biodiversity Framework • Climate Change and Biodiversity Adaptation • Geological Conservation Review • East Inshore and East Offshore Marine Plan 2013, • UK Marine Policy Statement 2011, |

| LDF Objectives | SA Objectives | Key Messages in sources | Main Sources |
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| | | environmental value. | <ul style="list-style-type: none"> • The wetland Vision for England 2008, • Government Forestry and Woodlands Policy Statement 2013 • Biodiversity Action Plan for the City of Norwich (2002) • Securing Biodiversity in Breckland: Guidance and Recommendations for Conservation and Research: First Report of the Breckland Biodiversity Audit (2010) • Further assessments of the relationship between buildings and stone curlew distribution (2013) • Norfolk's Earth Heritage – valuing our Geodiversity (Norfolk Geodiversity Partnership) (2010) • Norfolk Geodiversity Action Plan 2011-2016 (Norfolk Geodiversity Partnership) • Norfolk Geodiversity Partnership site audit (2009) • Biodiversity Supplementary Planning Guidance for Norfolk (NCC, 2004) • Norfolk Biodiversity Partnership – Habitats and Species Action Plans • Water for life and livelihoods. River basin management Plan, Anglian River basin District (DEFRA and Environment Agency 2009) • Realising the benefits of trees, woods and forests in the East of England - A Woodland for life Publication (2011) • Norwich City Council Environmental strategy 2011-2014 • GNDP Green Infrastructure Strategy (2007) and Delivery Plan (2009) • Borough Council of King's Lynn and West Norfolk - Green Infrastructure Study and Management Plan (2009) <p>The Local Plans and DPDs produced by Local Planning Authorities and listed under SA Objective SA13 also contain policies regarding the protection and enhancement of Norfolk's biodiversity and geodiversity.</p> |
| LDF7 Minimise the impact of mineral extraction and associated development | SA7: To promote innovative solutions for the restoration and afteruse of minerals sites and waste sites | Protect and enhance public rights of way and access. Use opportunities to reduce the causes and impacts of flood risk. Provide high quality restoration and aftercare, including for agriculture, geodiversity, | <ul style="list-style-type: none"> • Government Review of Waste Policy in England 2011, • NPPF, • NPPG, • Aarhus Convention, • New Anglia: Growth Deal (2014), • Localism Act, • Mainstreaming Sustainable Development, |

| LDF Objectives | SA Objectives | Key Messages in sources | Main Sources |
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| <p>and waste management facilities on the environment by promoting opportunities to enhance and protect biodiversity, landscape and geodiversity, water supply, the wider countryside, and cultural heritage</p> | | <p>biodiversity, native woodland, the historic environment and recreation.</p> <p>Develop strong, attractive and thriving neighbourhoods and societies and encourage public participation in the development of the local area.</p> | <ul style="list-style-type: none"> • By all Reasonable Means: Inclusive access to the outdoors for disabled people, • Countryside and Rights of Way Act (2000), • Healthy Lives, Healthy People: Our Strategy for Public Health in England, • National Planning Policy for Waste <ul style="list-style-type: none"> • Securing Biodiversity in Breckland: Guidance and Recommendations for Conservation and Research: First Report of the Breckland Biodiversity Audit (2010) • Norfolk's Earth Heritage – valuing our Geodiversity (Norfolk Geodiversity Partnership) (2010) • Norfolk Geodiversity Action Plan 2011-2016 (Norfolk Geodiversity Partnership) • Norfolk Geodiversity Partnership site audit (2009) • Biodiversity Supplementary Planning Guidance for Norfolk (NCC, 2004) • Norfolk Biodiversity Partnership – Habitats and Species Action Plans • Water for life and livelihoods. River basin management Plan, Anglian River basin District (DEFRA and Environment Agency 2009) • Realising the benefits of trees, woods and forests in the East of England - A Woodland for life Publication (2011) • Norwich City Council Environmental strategy 2011-2014 • Biodiversity Action Plan for the City of Norwich (2002) • GNDP Green Infrastructure Strategy (2007) and Delivery Plan (2009) • Borough Council of King's Lynn and West Norfolk - Green Infrastructure Study and Management Plan (2009) |
| <p>LDF7 Minimise the impact of mineral extraction</p> | <p>SA8: To protect and enhance the quality and distinctiveness of the countryside and</p> | <p>Conserve and improve local environmental quality, and landscapes, including the Broads Authority Executive Area, AONBs, and coastal landscapes.</p> | <ul style="list-style-type: none"> • EU Landscape Convention, • Climate Change and Biodiversity Adaptation: The Role of the Spatial Planning System, • Natural Environment and Rural Communities Act 2006, • English National Parks and the Broads, |

| LDF Objectives | SA Objectives | Key Messages in sources | Main Sources |
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| and associated development and waste management facilities on the environment by promoting opportunities to enhance and protect biodiversity, landscape and geodiversity, water supply, the wider countryside, and cultural heritage | landscape | <p>Require a high quality design of development which respects landscape character.</p> <p>Where applications for unconventional hydrocarbons represent major development planning permission should be refused in the Broads and AONBs except in exceptional circumstances and where it can be demonstrated that they are in the public interest.</p> | <ul style="list-style-type: none"> • NPPF, • National Planning Policy for Waste 2014, • Government Forestry and Woodlands Policy Statement 2013 • South Norfolk Landscape Assessment 2001 • South Norfolk Local Landscape Designations Review (2012) • Breckland District, Landscape Character Assessment, May 2007 (Land Use Consultants) • Broadland landscape Character Assessment SPD (2013) • Broads Landscape Character Assessment (2006) updated 2012 • Great Yarmouth landscape character assessment (2008) • North Norfolk landscape Character Assessment SPD • North Norfolk Design Guide SPD (2008) • South Norfolk place-Making Guide SPD (Sept 2012) • Norfolk Coast AONB management strategy 2009-2014 (Norfolk Coast Partnership) • Realising the benefits of trees, woods and forests in the East of England - A Woodland for life Publication (2011) • GNDP Green Infrastructure Strategy (2007) and Delivery Plan • Borough Council of King's Lynn and West Norfolk - Green Infrastructure Study and Management Plan (2009) <p>The Local Plans and DPDs produced by Local Planning Authorities and listed under SA Objective SA13 also contain policies regarding protection of the countryside and landscape.</p> |
| <p>LDF6</p> <p>Minimise the adverse traffic impacts of material extraction and associated development and waste</p> | SA9: To contribute to improved health and amenity of local communities in Norfolk | <p>Protect open space for community benefit.</p> <p>Limit the impacts of minerals extraction and waste management development on amenity.</p> <p>Take into account cumulative effects of multiple impacts from individual sites and/or a number of</p> | <ul style="list-style-type: none"> • NPPF, • NPPG, • Localism Act, • Natural Choice: Securing the Value of Nature, • Rio + 20 'Future we Want', • National and regional guidelines for aggregates provision in England, • Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural Land, • By all Reasonable Means: Inclusive access to the outdoors for disabled people, |

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| <p>management facilities</p> <p>LDF13</p> <p>Mitigate adverse impacts on amenity resulting from mineral extraction and associated development and waste management facilities</p> | | <p>sites in the locality. Seek to safeguard and improve the health and wellbeing of communities and improve inclusive access to services, facilities and the countryside.</p> <p>Protect and enhance public rights of way and access.</p> <p>Develop strong, attractive and thriving neighbourhoods and societies and encourage public participation in the development of the local area.</p> <p>Provide high quality restoration and aftercare, including for recreation.</p> | <ul style="list-style-type: none"> • Countryside and Rights of Way Act (2000), • Healthy Lives, Healthy People: Our Strategy for Public Health in England, • National Planning policy for Waste, • National Policy Statement for waste water, • National Policy Statement for hazardous waste <ul style="list-style-type: none"> • A New Vision for Norwich - The Sustainable Community Strategy 2008-2020 (City of Norwich Partnership) • GNDP Green Infrastructure Strategy (2007) and Delivery Plan (2009) • Borough Council of King's Lynn and West Norfolk - Green Infrastructure Study and Management Plan (2009) • Norwich Clinical Commissioning Group Health and Wellbeing Strategy 2013-2018 • Norwich Area Transportation Strategy (NCC) (2006) • Norwich Area Transportation Strategy Implementation Plan update (NCC) (2013) • Long Stratton Area Action Plan (pre-submission in October 2014) • Connecting Norfolk, Norfolk's Transport Plan for 2026 (LTP3) NCC 2011 • Connecting Norfolk Implementation Plan 2011-2015 (NCC) (2011) <p>The Local Plans and DPDs produced by Local Planning Authorities and listed under SA Objective SA13 also contain policies regarding health and amenity of local communities.</p> |
| <p>LDF8</p> <p>Minimise soil and water contamination and flood risk arising from minerals and waste activities</p> | <p>SA10: To protect and enhance soil and water quality in Norfolk</p> | <p>Enhance waterways and wetlands and recognise the impact that flood and water management works and pollution may have on the chemical, geomorphological, hydromorphological and ultimately, ecological status of waterways and wetlands.</p> | <ul style="list-style-type: none"> • Ramsar Convention, • European Nitrates Directive (91/676/EEC), • EU Groundwater Directive (2006/118/EC), • EU Urban Waste Water Directive (91/271/EEC), • EU Water Framework Directive (2000/60/EC), • EU SEA Directive (2001/42/EC), • Groundwater Protection: Policy and Practice, • NPPF, • NPPG, |

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| | | <p>Protect the best and most versatile agricultural land and fertile soils.</p> <p>Ensure development proposals do not result in unacceptable air, water or land pollution.</p> <p>Protect and enhance ground and surface waters; prevent deterioration and achieve overall good status of ground and surface waters.</p> | <ul style="list-style-type: none"> • Proposal for a Directive Establishing a Framework for the Protection of Soil (2006/0086), • Safeguarding our Soils, Protecting our Water, Soil and Air, • Agricultural Land Classification: Protecting the Best and Most Versatile Agricultural Land, • EU Nitrates Directive (91/676/EEC), • EU Bathing Water Directive (2006/7/EC), • Marine Strategy Framework Directive (2008/56/EC), • Directive on Ambient Air Quality & Cleaner Air (2008/50/EC) • EU Integrated Pollution Prevention & Control Directive (2008/1/EC), • Control of Pollution Act 1974 and Amending Act, 1989, • Environmental Protection Act, 1990, Environment Act 1995, <ul style="list-style-type: none"> • Fracking UK shale: water (DECC, 2014) • The Air Quality Strategy for England, Scotland, Wales, & NI • Breckland Stage 1 Water Cycle Study (2008) • Breckland Water Cycle Study Stage 2 (2010) • Water Cycle Study Stage 2 – Attleborough Findings (2010) • Great Yarmouth and Waveney Water Cycle Scoping Study (2009) • Outline WCS Phase 1 – BC King’s Lynn & West Norfolk (2009) • Water Cycle Study Phase 2 – BC King’s Lynn & West Norfolk (2011) • Water resources strategy: action plan for the Anglian Region (Environment Agency) (2009) • Water for life and livelihoods. River basin management Plan, Anglian River basin District (DEFRA and Environment Agency 2009) • Realising the benefits of trees, woods and forests in the East of England - A Woodland for life Publication (2011) • Norwich City Council Environmental strategy 2011-2014 • Essex and Suffolk Water – Water Resources Management Plan 2015-2040 (2014) • Anglian Water - Water Resources Management Plan 2015 |

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| <p>LDF2 Increase the proportion of waste recycling, composting and energy recovery</p> <p>LDF3 Minimise the amount of waste sent to landfill</p> <p>LDF10 Contribute to Renewables Obligation and regional targets for renewable energy by increasing the proportion of energy recovery from waste</p> | <p>SA11: To promote sustainable use of minerals and waste resources</p> | <p>Ensure that waste is managed as high up the waste hierarchy as practicable, recognising the need for a mix of types and scale of facilities, and that adequate provision must be made for waste disposal.</p> <p>Plan for the disposal of waste and the recovery of mixed municipal waste in line with the proximity principle, recognising that new facilities will need to serve catchment areas large enough to secure the economic viability of the plan.</p> <p>Ensure environmental limits are not breached.</p> <p>Ensure high quality design of built infrastructure.</p> <p>Support a low carbon economy.</p> | <ul style="list-style-type: none"> • Government Review of Waste Policy in England 2011, • NPPF, • NPPG, • National Planning Policy for Waste 2014, • Waste Regulations 2012, • Hazardous Waste Regulations 2009, • Waste Management Plan for England 2013, • Agricultural Waste Regulations • EU Transport White Paper, • European Sustainable Development Strategy, • The Carbon Plan, • New Anglia: Growth Deal 2014, • Carbon Budget Order 2011, • UK Renewable Energy Roadmap, • UK Bioenergy Strategy, • Microgeneration Strategy, • Energy Bill, • Strategy for Sustainable Construction, • UK Sustainable Development Strategy, • Mainstreaming Sustainable Development, • Sustainable Communities: A shared vision, a shared agenda. <ul style="list-style-type: none"> • Natural Choice: Securing the Value of Nature, • Planning for Climate Change –Guidance for Local Authorities, • Rio + 20 ‘Future we Want’, • Safeguarding our Soils, • Water White Paper, • Groundwater Protection : Policy and Practice, |

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| <p>LDF1 Ensure steady and adequate provision of primary, and increasingly recycled and secondary, minerals to meet requirements</p> | <p>SA11: To promote sustainable use of minerals and waste resources</p> | <p>Plan for a steady and adequate supply of aggregates in Norfolk.</p> <p>Make provision for the extraction of mineral resource of local and national importance in Norfolk.</p> <p>Do not identify new sites or extensions for peat extraction.</p> <p>Take into account the contribution that substitute or secondary and recycled material and minerals waste would make to the supply of materials before considering extraction of landwon minerals.</p> <p>Safeguard known locations of mineral resources of local and national importance so they are not needlessly sterilised by non-mineral development.</p> <p>Safeguard mineral infrastructure (such as rail heads and wharfage for bulk transport, concrete and recycled aggregate activities).</p> | <ul style="list-style-type: none"> • UK Marine Policy Statement, • Protecting our Water, Soil and Air, • Air Quality Standard Regulations, • Air Quality Strategy for England, Scotland, Wales and Northern Ireland, • Climate Change Act, • Control of Pollution Act, • Environmental Permitting Regulations, • Environmental Protection Act, • EU Directive on Energy Performance of Buildings (2002/91/EC), • Strategy for Sustainable Construction, • BREEAM, • CEEQuAAL, • World Class Places: The Government's Strategy for Improving the Quality of Places, • EU Landfill Directive (99/31/EC), • EU Waste Framework Directive (2008/98/EC), • NPPF, • NPPG, • National Planning Policy for Waste 2014, • Waste Regulations 2012, • Hazardous Waste Regulations 2009, • Waste Management Plan for England 2013, • Agricultural Waste Regulations, • Anaerobic Digestion Strategy and Action Plan, • Strategy for the Management of Solid Low Level Radioactive Waste from the Non-Nuclear Industry, • National Policy Statement for waste water, |

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| | <p>SA11: To promote sustainable use of minerals and waste resources</p> | <p>Maintain a landbank of at least 7 years for sand and gravel and at least 10 years for crushed rock.</p> <p>Plan for a steady and adequate supply of silica sand. Provide a stock of at least 10 years of permitted reserves to support investment in processing plant and equipment.</p> <p>The exploratory, appraisal or production phase of hydrocarbon extraction can only take place where DECC have issued a Petroleum Licence. Norfolk does not currently (December 2014) have any areas currently under licence. The 14th onshore round of licensing by DECC in 2014, included the northern half of Norfolk as one of the areas under offer for applications for licences. The outcome of this licensing round is expected in 2015.</p> | <ul style="list-style-type: none"> • National Policy Statement for hazardous waste • Fracking UK shale: planning permission and communities (DECC, 2014) • Shale Gas: made simple (DECC, 2014) • Developing Onshore Shale Gas and Oil – Facts about ‘Fracking’ (DECC, 2013) • Fracking UK shale: climate change (DECC, 2014) • Fracking UK shale: local air quality (DECC, 2014) • Fracking UK shale: regulation and monitoring (DECC, 2014) • Fracking UK shale: safety from design to decommissioning (DECC, 2014) • Fracking UK shale: understanding earthquake risk (DECC, 2014) • Fracking UK shale: water (DECC, 2014) • Background note on shale gas and hydraulic fracturing (DECC, 2014) • Onshore oil and gas exploration in the UK: regulation and best practice (DECC, 2013) • Essex Minerals Local Plan (2014) • Essex County Council & Southend-on-Sea Waste Local Plan (2001) • Thurrock Core Strategy and Policies for Management of Development (2011) • Hertfordshire Waste Core Strategy and Development Management Policies Document (2012) • Hertfordshire Minerals Local Plan (2007) • Hertfordshire Waste Site Allocations (2014) • Suffolk County Council - Minerals Core Strategy DPD (2008) • Suffolk County Council - Minerals Site Specific Allocations DPD (2009) |

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| | SA11: To promote sustainable use of minerals and waste resources | | <ul style="list-style-type: none"> • Suffolk County Council - Waste Core Strategy (2011) • Cambridgeshire and Peterborough Minerals and Waste Core Strategy (2011) • Cambridgeshire and Peterborough Minerals and Waste Site Specific Proposals Plan (2012) • Bedford Borough, Luton Borough & Central Bedfordshire Authorities - Minerals and Waste Local Plan: Strategic Sites and Policies (2014) • Bedfordshire & Luton Minerals and Waste Local Plan 'saved' policies (2005) • Bedford Borough, Luton Borough & Central Bedfordshire Authorities -Minerals Technical Evidence paper 4: silica sand reserves and recent production (2011) • Minerals Technical Evidence Paper 2: Bedfordshire Silica Sand Study 2006/7 (Cuesta Consulting Limited) (2008) • Lincolnshire Minerals Local Plan 'saved' policies (1991) • Lincolnshire Waste Local Plan (2006) • Surrey Minerals Plan Core Strategy DPD and Primary Aggregates DPD (2011) • Cheshire West and Chester Local Plan (Part one) (at examination in 2014) • Cheshire County Council – Replacement Minerals Local Plan 'saved' policies (1999) • North Yorkshire Minerals Local Plan 'saved' policies (1997) • North Lincolnshire Local Plan 'saved' policies (2003) • Norfolk Core Strategy and Minerals and Waste Development Management Policies DPD 2010-2026 (2011) • Norfolk Waste Site Specific Allocations DPD (2013) • Norfolk Minerals Site Specific Allocations DPD (2013) • Joint Municipal Waste Management Strategy for Norfolk 2006-2020 (2006) • East of England Aggregate Working Party – Annual Monitoring Report 2012 (2013) • Norwich City Council Environmental strategy 2011-2014 |

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| <p>LDF4: Ensure mineral working takes place as close as reasonably possible to where these resources are used, & that waste is treated as close as reasonably possible to where it is generated</p> <p>LDF 5: Increase the use and availability of sustainable transport in accessing waste and minerals facilities</p> | <p>SA11: To promote sustainable use of minerals and waste resources</p> | <p>Consider the suitability of the road network and the extent to which access would require reliance on local roads, the rail network and transport links to ports.</p> <p>Use sustainable modes of transport, such as rail for bulk minerals and waste movements where practicable.</p> <p>Protect existing infrastructure (rail heads and wharfs) that enable alternative transport to be used.</p> <p>Assess the capacity of existing and potential transport infrastructure to ensure new development does not increase traffic congestion.</p> <p>Consider the location of mineral extraction and associated development and waste management facilities in relation to the markets for the goods and services provided.</p> | <ul style="list-style-type: none"> • Low Carbon Transport: A Greener Future, • Low Emissions Strategies, • Expanding and Improving the Rail Network, • Creating Growth, Cutting Carbon: Making Sustainable Local Transport Happen, • Norwich Area Transportation Strategy (NCC) (2006) • Norwich Area Transportation Strategy Implementation Plan update (NCC) (2013) • Long Stratton Area Action Plan (pre-submission in October 2014) • Connecting Norfolk, Norfolk's Transport Plan for 2026 (LTP3) NCC 2011 • Connecting Norfolk Implementation Plan 2011-2015 (NCC) (2011) • Norwich City Council Local Air Quality Management – Detailed Assessment 2012 • Gaywood Clock Air Quality Management Area (2009) • Railway Road Air Quality Management Area (2007) • A New Vision for Norwich - The Sustainable Community Strategy 2008-2020 (City of Norwich Partnership) |
| <p>LDF8 Minimise soil and water contamination and flood risk arising from minerals and</p> | <p>SA12: To reduce the risk of current and future flooding at new and existing development</p> | <p>Recognise the impact of flooding on new and existing development and also the impact this development can have on exacerbating the risk of flooding elsewhere, taking into account the impacts of climate change.</p> | <ul style="list-style-type: none"> • EU Floods Directive (2007/60/EC) • EU Water Framework Directive (2000/60/EC) • Flood and Water Management Act 2010 • NPPF • NPPG • Marine Strategy Framework Directive (2008/56/EC) • Marine and Coastal Access Act |

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|--|---|---|--|
| waste activities | | <p>Ensure that development does not increase flood risk.</p> <p>Consider opportunities to reduce flood risk through better management of surface water, provision for conveyance and of storage of flood water. New developments should incorporate sustainable drainage systems.</p> <p>Avoid inappropriate development in areas vulnerable to coastal change.</p> | <ul style="list-style-type: none"> • UK Marine Policy Statement • Natural Choice: Securing the Value of Nature <ul style="list-style-type: none"> • Norfolk's Local Flood Risk Management Strategy (2015) • Partnership of Norfolk Authorities SFRA (2008) (Broadland, Norwich City, South Norfolk, Broads Authority, North Norfolk) • Norwich City Council SFRA Level 2 (2010), • Norwich Urban Area Surface Water Management Plan (2011) • Breckland Council – Strategic Flood Risk Assessment (June 2005) • Breckland SFRA 2007 Update (Feb 2008) • Broadland Rivers Catchment Flood Management Plan (Environment Agency) (2009) • Broads Authority Development and Flood Risk SPD (2008) • Broads Authority Strategic Flood Risk Assessment (2007) • Great Yarmouth Strategic Flood Risk Assessment (2009) • Great Yarmouth Borough Surface Water Management Plan (NCC, GYBC) (2014) • King's Lynn & West Norfolk SFRA 2007 (addendum 2009) • Great Ouse Catchment Flood Management Plan (Environment Agency, 2009) • The Wash Shoreline Management Plan (2010) • Kelling to Lowestoft Ness Shoreline Management Plan (2010) • North Norfolk Shoreline Management Plan (2011) <p>The Local Plans and DPDs produced by Local Planning Authorities and listed under SA Objective SA13 also contain policies regarding flood risk.</p> |
| LDF1 Ensure steady and adequate provision of primary, and increasingly recycled and secondary, | SA13: To encourage employment opportunities and promote economic growth | Provide a steady and adequate supply of minerals to the economy. Ensure continued economic viability and access to services for rural areas. Across Norfolk as a whole, between 2013 and 2026, the | <ul style="list-style-type: none"> • Rio + 20 'Future we Want', • NPPF • NPPG • National and regional guidelines for aggregates provision in England • New Anglia: Growth Deal 2014 • Defra Rural Statement • Localism Act 2011 <ul style="list-style-type: none"> • Norfolk Infrastructure Plan (NCC), • New Anglia LEP: Strategic Economic Plan, |

| LDF Objectives | SA Objectives | Key Messages in sources | Main Sources |
|--|---------------|---|---|
| <p>minerals to meet requirements</p> <p>LDF11 Improve employment opportunities, particularly for those most in need</p> | | <p>Local Planning Authorities plan to deliver 65,000 dwellings and around 60,000 jobs.</p> <p>The Greater Norwich City Deal commits Broadland, Norwich and South Norfolk districts to deliver 13,000 more jobs than the Joint Core Strategy target and bring forward 3,000 dwellings from the period after 2026.</p> <p>The scale of growth should reflect a location's ability to provide jobs, services and sustainable transport. Therefore growth in Norfolk, in terms of additional dwellings, is concentrated in and around urban areas, selected market towns and well-located villages with local services.</p> <p>The planned housing development will also require associated infrastructure.</p> <p>Additional transport infrastructure included in Norfolk's 3rd Local Transport Plan includes the Norwich Northern Distributor Road, Bus Rapid Transit for the Norwich area, Junction improvements at Postwick, Longwater and Thickthorn, Norwich city centre enhancements. A Third River Crossing is required at Great Yarmouth to enhance access to</p> | <ul style="list-style-type: none"> • Greater Cambridgeshire & Greater Peterborough LEP: Strategic Economic Plan • GNDP Greater Norwich Economic Strategy (2009-2014) • Borough Council of King's Lynn and West Norfolk Economic Strategy (2009) • Delivering Economic Growth in Norfolk – the strategic Role for Norfolk County Council 2012-2017 • Local Economic Assessment for Norfolk – Sept 2013 update • Realising the benefits of trees, woods and forests in the East of England - A Woodland for life Publication (2011) • A New Vision for Norwich - The Sustainable Community Strategy 2008-2020 (City of Norwich Partnership) • Breckland Core Strategy (2009) • Breckland Site Specific Policies and Proposals DPD (2012) • Thetford Area Action Plan DPD (2012) • Breckland Core Strategy Infrastructure Study (Attleborough Findings) (2008) • Attleborough Strategic Masterplan, 2011 • Broadland District Council Development Management DPD • Broadland District Council – Site Allocations DPD • Broadland District Council – Growth Triangle Area Action Plan • Broads Authority Core Strategy (2007) • Broads Development Management Policies DPD (2011) • Broads Site Specifics Local Plan (2009) • Greater Norwich Development Partnership Joint Core Strategy for Broadland, Norwich and South Norfolk (2011 & 2014) • Great Yarmouth Borough Core Strategy Local Plan • Great Yarmouth Borough-wide Local Plan 'saved' policies (2001) • King's Lynn and West Norfolk Core Strategy (2011) • King's Lynn and West Norfolk Site Allocations and Development Management Policies • King's Lynn and West Norfolk Infrastructure Study (2015) • North Norfolk Core Strategy incorporating Development Control Policies (2009) |

| LDF Objectives | SA Objectives | Key Messages in sources | Main Sources |
|----------------|---------------|--|--|
| | | <p>the port and remove freight traffic from the town centre.</p> <p>Improvements are also required to the A47.</p> <p>This planned new housing, jobs and related infrastructure development will require aggregate minerals for its construction and waste management facilities, including sufficient waste water treatment capacity, to meet the needs of the population and businesses.</p> <p>Minerals and waste management operations also provide local employment.</p> <p>Prioritise the location of waste management facilities to enable the reuse of previously developed land, sites identified for employment uses, and redundant agricultural and forestry buildings and their curtilages.</p> <p>Important role of waste management in the circular economy to reduce waste and drive greater resource productivity.</p> | <ul style="list-style-type: none"> • North Norfolk Site Allocations DPD (2011) • Norwich City Development Management Policies Local Plan (2014) • Norwich City Site Allocations and Site Specific Policies Local Plan (2014) • South Norfolk Development Management Policies Document • South Norfolk Site Specific Allocations and Policies Document • Wymondham Area Action Plan • Long Stratton Area Action Plan • Norfolk Ambition – Sustainable Community Strategy 2003-2023 • Norfolk Rural Development Strategy 2013-2020 • Norfolk Core Strategy and Minerals and Waste Development Management Policies DPD 2010-2026 (2011) • Norfolk Waste Site Specific Allocations DPD (2013) • Norfolk Minerals Site Specific Allocations DPD (2013) • Connecting Norfolk, Norfolk’s Transport Plan for 2026 (LTP3) NCC 2011 • Connecting Norfolk Implementation Plan 2011-2015 (NCC) (2011) • Forest Heath Core Strategy (2010) • Forest Heath and St Edmundsbury Joint Development Management Policies Document • Fenland Local Plan (2014) • East Cambridgeshire Core Strategy (2009) • Local Plan for East Cambridgeshire • The approach to future development in Waveney -Core Strategy (2009) • Waveney District Council - Site Specific Allocations (2011) • Waveney District Council - Development Management Policies (2011) • South Holland Local Plan ‘saved’ policies (2006) |

4.2 Implications of the review of relevant policies, plans and programmes

During the policies, plans and programmes review, a number of key issues were identified that should be taken into account in the Silica Sand Review and the Minerals and Waste Core Strategy Review and in the SA/SEA. These included:

- Climate change mitigation and adaption: Reducing contributions to climate change through reduced landfilling, reducing mineral and waste road transportation where practicable, encourage energy efficient buildings and energy from renewable or low carbon sources.
- Improving health and well-being: Ensuring mineral extraction and associated development and waste management facilities do not adversely affect residential amenity through their location and operations, including air quality, noise, vibration, odour and transport impacts. Take into account cumulative impacts. Consider the potential to provide enhancements to public open space, public rights of way and recreation through restoration schemes.
- Protection and enhancement of landscape, the built environment and historic environment: Ensuring mineral extraction and associated development and waste management facilities are not located in areas that could adversely affect landscape, townscape or heritage assets. Promote good design. Provide enhancement through restoration schemes;
- Protection and enhancement of biodiversity, geodiversity and the natural environment: Ensuring mineral extraction and associated development and waste management facilities are not located in areas that could adversely affect biodiversity, geodiversity, water quality and soil quality. Provide enhancement through restoration schemes;
- Sustainable resource use: Ensuring minerals and waste resources are used efficiently. Ensuring sufficient facilities for waste re-use, recycling, composting and recovery to enable waste to be managed as high up the waste hierarchy as practicable. Consider the location of minerals extraction and waste management facilities in relation to the markets for the goods and services provided and the suitability of the road network.
- Minimisation of flood risk: Ensuring minerals extraction and associated development and waste management facilities do not increase flood risk and are not situated in areas of high flood risk. Use restoration opportunities to reduce the causes and impacts of flood risk; and
- Supporting local economic growth: Providing a steady and adequate supply of minerals to the economy to support the planned house building, jobs growth and associated infrastructure. Providing sufficient waste management facilities, including waste water treatment capacity to meet the needs of the population and businesses. Plan for a steady and adequate supply of silica sand. Safeguard known locations of mineral resources and mineral infrastructure.

5. Task A2: Baseline Conditions

5.1 Introduction

The establishment of a sustainability baseline helps develop a basis for forecasting and monitoring the effects the Silica Sand Review and the Minerals and Waste Core Strategy Review may have on the environment, society and economy. It also helps to identify existing and potential future environmental, social and economic problems and issues. In order to establish sustainability baseline conditions for Norfolk, existing sustainability data were collected from a wide range of sources including:

- Norfolk County Council
- Environment Agency
- Historic England
- Natural England
- www.magic.gov.uk (Multi-Agency Geographic Information for the Countryside - a web-based interactive map service)
- The adopted Minerals and Waste Development Framework

Both qualitative and quantitative indicators have been developed and extracted from the above data and documents. This information, coupled with an examination of thresholds, trends, and existing targets will be used to describe the current state of the environment and the likely evolution of the environment without implementation of the plan, or the “do nothing” scenario, as required by the SEA Directive.

As much of the SA process is iterative, the baseline will be continually reviewed in the light of consultation responses and changing circumstances.

Indicators will be selected mainly on the basis that they should be:

- Measurable
- Able to track progress against sustainability objectives at the Norfolk scale
- Available on an annual basis, to feed into Annual Monitoring Report, where possible
- Using data which is already collected wherever possible without significant resource implications for Norfolk County Council

Consideration will be given as to whether enough information on each indicator is available to answer the following questions:

- How good or bad is the current situation? Do trends show that it is getting better or worse?
- How far is the current situation from any established thresholds or targets?
- Are particularly sensitive or important elements of the economy, physical environment or community affected?

- Are the problems reversible or irreversible, permanent or temporary?
- How difficult would it be to offset or remedy any damage?
- Have there been significant cumulative or synergistic effects over time?
- Are there expected to be such effects in the future?

Section 5.1 summarises the relationship between the SA objectives, indicators, baseline, as well as the trends and targets. This information will be used to describe the baseline scenario against which the effects of the Silica Sand Review and the Minerals and Waste Core Strategy Review will be assessed. The sustainability baseline is described in detail in the following sub-sections.

Table 7: Sustainability Baseline Summary

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year |
|----------------|---|---|--|---|------|
| Climate | SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | Methane emissions from landfill sites in the UK (kt) % used in power generation % emitted into the atmosphere Carbon Dioxide emissions by Local Authority area | 2,390 kt generated 59% captured 52% used in power generation 7% flared 4% residual methane oxidised 37% methane emitted 7,153 kt generated in Norfolk (2005) 6,559 kt generated in Norfolk (2013) | UK methane emissions in the waste sector have decreased by 55% from 1990 to 2012 due to increased implementation of methane recovery systems at landfill sites. This trend is likely to continue as all new landfill sites are required to have these systems and many existing sites may have systems retrofitted. (UK GHG inventory 1990-2012 (April 2014) Ricardo AEA for DECC (Table A 3.7.2) Carbon Dioxide emissions for Norfolk have decreased over the period 2005-2013. However, individual Local Authority's performance has varied. All Authorities have recorded a decrease except for King's Lynn and West Norfolk which increased. (DECC Local Authority carbon dioxide emissions: 2005-2013 (2015)) | 2012 |

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year |
|----------------------|--|---|------------------------|--|--------------|
| Air, Human Health | SA2: To improve air quality in line with the National Air Quality Standards | Area of AQMAs in Norfolk | 282 hectares | Area increased this year in Norwich, as a result of the amalgamation of three separate AQMAs. AQMA in rural Breckland removed this year. | 2014 |
| | SA3: To minimise noise, vibration and visual intrusion | Number of complaints about the adverse impacts from minerals and waste | 39 | Increase from 2012/13 (33 complaints, however a decrease from 55 recorded in 2010/11 | 2013/14 |
| Population | SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Index of Multiple Deprivation: % lower super output areas in the 20% most deprived nationally | 9.6% | Decrease from 10.6% in 2007 | 2010 |
| | | Employment Deprivation: % lower super output areas in the 10% most deprived nationally | 6.4% | Increase from 6.2% in 2007 | 2010 |
| Historic Environment | SA5: To maintain and enhance the character of the townscape and historic environment | % of listed buildings at risk % scheduled ancient monuments at risk | 100 (0.95%) 22 (5%) | England: 2,433 listed buildings, 2,720 scheduled monuments, Suffolk: 40 listed buildings, 22 scheduled monuments, Cambridgeshire: 22 listed buildings, 55 scheduled monuments (2014) | 2014 2014 |
| | | Number of registered historic parks and gardens | 51 | England:1,632, East of England: 213, Suffolk: 23, Cambridgeshire: 34 (2014) | 2014 |
| | | Number of Conservation Areas and Conservation Area Appraisals | 304 | Local increase | 2014 |

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year |
|-------------------------------|---|--|-------------------------|---|------|
| | | Number of planning permissions granted contrary to historic environment objections from statutory consultees | Nil | Nil | 2014 |
| Biodiversity, flora and fauna | SA6: To protect and enhance Norfolk's biodiversity and geodiversity | Sites of Special Scientific Interest (SSSI): <ul style="list-style-type: none"> ▪ Number ▪ Area (ha) ▪ % in favourable or unfavourable recovering condition | 162 39,205 94.69% | 95.99% of SSSIs in England were in favourable or unfavourable recovering condition in 2014. 93.8% of SSSIs in the East of England were in favourable or unfavourable recovering condition in 2014. | 2014 |
| | | Number and area (ha) of Local Nature Reserves | 27 899.18 | England 1,558, Suffolk 36, Cambridgeshire 27 (2014) | 2014 |
| | | Number of non-statutory geodiversity sites such as County Geodiversity Sites | 5 | No change since 2008 | 2014 |
| | | Change in Norfolk BAP species throughout the county | 419 | National list of all BAP species - 1164 | 2009 |
| | | Number of County Wildlife Sites | 1326 | Number increasing | 2015 |
| | | Number of planning permissions granted contrary to biodiversity or geodiversity objections from | Nil | Nil | 2014 |

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year |
|-------------------------------|--|---|---------------------|--|---------|
| | | statutory consultees | | | |
| | | Number of planning permissions granted with restoration schemes providing biodiversity or geodiversity benefits | 2 | 2 | 2013/14 |
| Biodiversity Landscape | SA7: To promote innovative solutions for the restoration and afteruse of minerals sites | Planning permissions granted for minerals extraction requiring progressive restoration schemes | All new permissions | All new permissions granted for mineral extraction in Norfolk will require a progressive restoration scheme. Two new permissions were granted in 2013/14 | 2013/14 |
| Landscape | SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | % Woodland area land cover | 9.8% | National: 8.6% East of England: 7.3% | 2002 |
| | | Number of planning permissions for mineral and waste sites granted within or adjacent to (within 100m of) the AONB | 3 | Two mineral workings are located within the AONB, both of which were established prior to the AONB being designated. One site adjacent to the AONB was granted in 2014 | 2014 |
| | | Number of planning permissions for mineral and waste sites granted within or adjacent to (within 100m of) the Heritage Coast Area | Nil | Nil | 2014 |

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year |
|----------------|---|--|----------|--|------|
| | | Number of planning permissions for minerals and waste sites granted within or adjacent to (within 100m of) the Broads Authority Executive Area | 5 | 2 Mineral workings and 3 Waste management facilities are within 100m of the Broads Authority Executive Area | 2014 |
| | | Number of planning permissions granted within or adjacent to (within 100 m of) Conservation Areas | 6 | 3 Mineral workings and 3 Waste management facilities are located within 100m of a Conservation Area. 2 of the mineral workings and 2 of the waste management facilities were in existence prior to the designation of the Conservation Area. | 2014 |
| | | Number of planning permissions granted contrary to landscape objections from statutory consultees | Nil | Nil | 2014 |
| Human Health | SA9: To contribute to improved health and amenity of local communities in Norfolk | % lower super output areas in Norfolk in the 10% most health deprived nationally | 2.45% | Increase from 1.8% in 2007 | 2010 |
| | | % lower super output areas in Norfolk in the 10% most living environment deprived | 3.0% | Decrease from 3.4% in 2007 | 2010 |

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year | |
|-----------------|--|--|----------------------|--|---------|--|
| Water, Soil | SA10: To protect and enhance water and soil quality in Norfolk | % of Biological River Quality classified as good or very good | 18% (Anglian region) | National: 73% in 2009 (increase from 72% in 2008) | 2009 | |
| | | % of Chemical River Quality classified as good or very good | | National: 73% in 2009 (increase from 72% in 2008) | 2009 | |
| | | Number of permissions granted contrary to Environment Agency advice on water quality grounds | Nil | Nil | 2014 | |
| Material Assets | SA11: To promote sustainable use of minerals and waste resources | Household waste per head of population – kilograms | 437 | Slight increase in Norfolk for 2013/14 following reductions since 2008/09 Average 482kg per head of population in the UK in 2008/9 National figure for 2012/13 was 423Kg per head compared with 433Kg per head in Norfolk. (Norfolk population estimate is 870,100) | 2013/14 | |
| | | Household waste arising - tonnes | 379,873 | Slight increase on previous two years when arisings were under 376,000 tpa. | 2013/14 | |
| | | % of household waste: | | | | |
| | | <ul style="list-style-type: none"> ▪ recycled | 23.7% | Decrease on percentage recycled in recent years. In 2009/10, 2010/11 and 2011/12 over 27% of household waste was recycled. | 2013/14 | |

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year |
|----------------|--------------|--|----------|---|---------|
| | | <ul style="list-style-type: none"> ▪ composted | 18.8% | Slight continued increase on percentage composted in recent years. (15.6% in 2009/10, 17.2% in 2010/11, 17.8% in 2011/12) | 2013/14 |
| | | <ul style="list-style-type: none"> ▪ incinerated with energy recovery | 8.2% | Lower percentage than in 2012/13 (9%) but higher percentage than all other previous years. | 2013/14 |
| | | <ul style="list-style-type: none"> ▪ sent for refuse derived fuel | 3.8% | No waste sent for RDF until 2011/12. Increase on % sent in previous two years. | 2013/14 |
| | | <ul style="list-style-type: none"> ▪ landfilled | 44.9% | Slight increase in percentage landfilled in 2012/13 (44.28%) but decrease compared to all other previous years (e.g. 52% in 2011/12) | 2013/14 |
| | | % tonnage of waste recycled, composted and reused through households waste recycling centres (HWRCs) | 64.28% | 2013/14 shows a reduction in the percentage recycled etc in recent years. For example, in 2012/13 73% of waste at HWRCs was recycled etc. (42,357 tonnes recycled, composted & reused in 2013/14 out of a total of 65,890 tonnes received) | 2013/14 |
| | | Municipal Waste Arising - tonnes | 396,740 | Slight increase on recent years. However, arisings continue to be | 2013/14 |

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year |
|----------------|--------------|---|---------------------------------------|---|---------|
| | | | | lower than all years prior to 2009/10. | |
| | | Inert waste input (tonnes) <ul style="list-style-type: none"> ▪ Inert landfill/ quarry restoration ▪ Inert waste received at non-hazardous landfills ▪ Recovered | 270,000 102,171 407,000 | Increase in waste to inert landfills & quarry restoration compared to 2012/13 (247,000t), but general decrease since 2009/10. Likely to be due to reduced construction and mineral extraction. Decrease in quantity recovered compared to 2012/13, but greater than 2011/12 and 2010/11. Quantity of inert waste recovered reduced significantly from 2006/7 to 2010/11 likely due to reduced construction. | 2013/14 |
| | | Non-hazardous waste input (tonnes): <ul style="list-style-type: none"> ▪ Landfilled ▪ Recovered | 257,500 825,000 | Reduction in non-hazardous waste to landfill compared to previous year. Continued general trend of a reduction in non-hazardous waste to landfill over the previous 10 years. Increase in waste recovered compared to all previous years. However, this is partly due to one large facility (100,000 tpa) reporting their figures where they had not done so before. Also a general increase in recycling and composting figures at existing sites compared to the previous two years. | 2013/14 |

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year |
|----------------|---|--|---|--|--|
| | | Sand & gravel Production – tonnes 10 years' sales average - tonnes Permitted reserves – tonnes Landbank - years | 1,114,935 1,705,088 13,335,398 7.8 | Decrease of 1.5% from 2012 figure, which itself was a decrease of 12% from 2011 production. Lower than the average for the last 20 years (2.21 million tonnes) | 2013 2004-2013 31/12/2013 31/12/2013 |
| | | Carstone: Production – tonnes 10 years sales average – tonnes Permitted reserves – tonnes Landbank - years | 37.193 123,306 1,841,470 14.9 | Decrease of 68% from the 2012 figure, which was an increase of 90% from 2011 production. Lower than the average for the last 20 years (206,000 tonnes) | 2013 2004-2013 31/12/2013 31/12/2013 |
| | | Silica sand: 3 year sales average – tonnes 10 years' sales average – tonnes Permitted reserves – tonnes Landbank - years | 790,100 636,500 3,500,000 5.5 | Increase of 1.7% from the three year average from 2011-2013, which was a increase of 19% from the 2010-2012. Increased production as other similar sites in England have closed at the end of their working lives. | 2012-2014 2005-2014 31/12/2014 31/12/2014 |
| Climate, Water | SA12: To reduce the risk of current and future flooding at new and existing development | Number of minerals and waste planning permissions granted contrary to the advice of the Environment Agency or Norfolk County Council as Lead Local Flood Authority on flood risk grounds | 0 | Continued position that minerals and waste permissions have not been granted in Norfolk contrary to an objection from the Environment Agency on flood risk grounds. | 2013/14 |

| SEA Topic Area | SA Objective | Indicator | Baseline | Comparators (Benchmark, trend or target) | Year |
|----------------|---|------------------------------|----------|---|---------------------|
| Population | SA13: To encourage employment opportunities and promote economic growth | Unemployment Rate in Norfolk | 6.7% | England 7.6%. The national figure is are a small decrease on the 2010/11 figures, the Norfolk figure is an increase on the 2010/11 figure | Dec 2012 – Dec 2013 |

5.2 Description of the Current Sustainability Baseline

5.2.1 Climate change

Emissions of greenhouse gases have been identified as a world-wide problem as evidenced by the international treaty on climate change, the Kyoto Protocol. It is commonly recognised that emissions of greenhouse gases can contribute to climate change. Judged by overall impact, carbon dioxide (CO₂) is the most important greenhouse gas in the UK, with methane the second most important. The major sources of methane are landfilled biodegradable waste, agriculture, natural gas distribution and coal mining. Methane emissions arise from landfill sites and also contribute significantly to climate change as they have a very high global warming potential (molecule for molecule, about 20 times that of CO₂).

Carbon dioxide, the most common greenhouse gas, is also cause for concern as emissions arise from the use of energy in the production processes at minerals and waste facilities, and are also emitted through the transport of minerals and waste.

5.2.2 Air

Air quality throughout the county and in the East of England is generally good, and problems arise only on a localised basis. Norfolk currently (2014) contains three Air Quality Management Areas (AQMAs) - one in Norwich and two in King's Lynn which have all been declared for exceeding limits of nitrogen dioxide (NO₂) from traffic sources.

5.2.3 Population

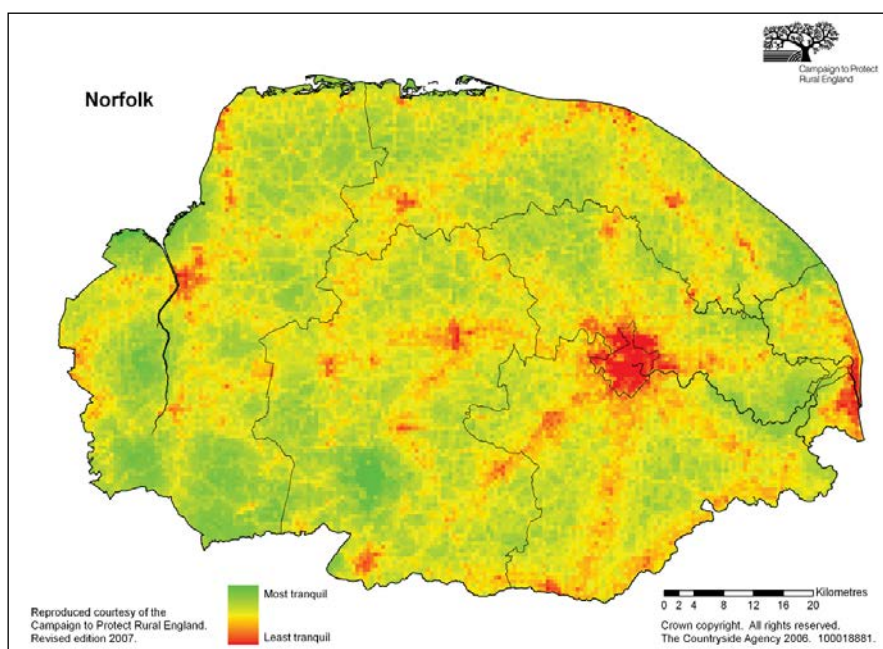
There were 870,100 people living in Norfolk in 2013 (Population estimates based on Census data on www.norfolkinsight.org.uk) of whom about 317,000 lived in urban areas of Norwich (210,000), Great Yarmouth (63,000) and King's Lynn (44,000). The Norfolk population increased by around 7.1% from 2001-2011. The county's population density is 1.6 people per hectare.

Norfolk has an ageing population, with larger proportions of ages of 45 and older, and lower proportions of ages below 44, than is seen in the East of England or England as a whole. To illustrate, in 2011 48.7% were aged 45 or over in Norfolk, compared with 43.7% for the East of England and 41.8% in England as a whole.

Issues which could affect Norfolk's population include amenity problems such as noise, dust, odour, birds, litter, visual intrusion and vibration, as well as accessibility and social exclusion. Complaints which arise from minerals and waste sites can be used as a proxy through which to measure general amenity issues, as they are typically complaints of noise nuisance, dust, etc. The number of complaints about minerals and waste facilities received by Norfolk County Council was 39 in 2013-14 and 33 in 2012/13, a significant reduction from the 55 recorded in 2010-2011. This general downward trend has been evident for a number of years with complaints falling steadily from a high of 220 in 2002-2003.

Loss of tranquillity from noise and light pollution is also an issue in Norfolk, and tranquil areas can be viewed in Figure 5-1.

Figure 5-1: Tranquillity in Norfolk



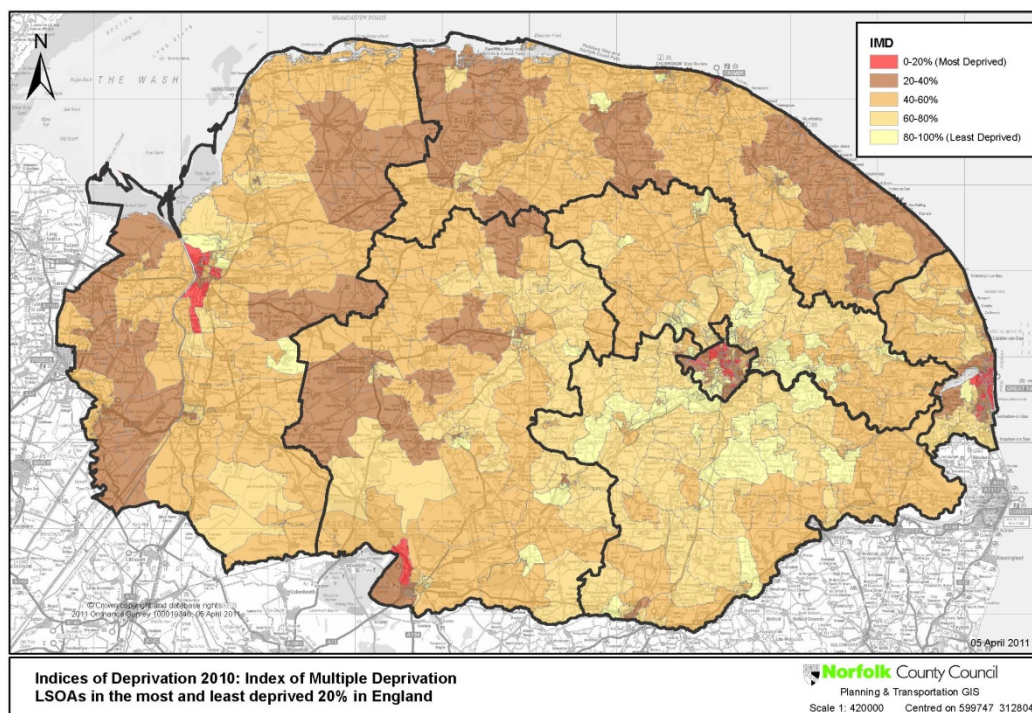
Source: <http://www.cpre.org.uk/campaigns/landscape/tranquillity/national-and-regional-tranquillity-maps/county-tranquillity-map-norfolk>

The Index of Multiple Deprivation is often used to highlight those areas most likely to suffer from social exclusion. It is important to note that not everybody who lives in a deprived area is deprived and vice versa that not everyone who is deprived lives in a deprived area. The Indices of Multiple Deprivation are described by DCLG (2010) as follows “The model of multiple deprivation... is based on the idea of distinct domains of deprivation which can be recognised and measured separately. These domains are experienced by individuals living in an area. People may be counted in one or more of the domains, depending on the number of types of deprivation they experience.” Seven distinct domains of deprivation are combined in the Index of Multiple Deprivation. The seven domains are: income deprivation, employment deprivation, health deprivation and disability, education skills and training deprivation, barriers to housing and services, living environment deprivation and crime.

In Norfolk, in 2007, 56 (or 10.6%) of lower super output areas (groupings of Census Output Areas with a minimum population size of 1,000 persons and nested within Census Ward boundaries) were ranked among the 20% most deprived nationally. These areas are predominantly located in urban areas, centred on Norwich, Great Yarmouth, and King's Lynn, as can be seen in Figure 5-2.

In 2010 the situation had changed slightly with 51 LSOAs (or 9.6%) ranked among the 20% most deprived nationally. The Indices of Deprivation study (DCLG) indicated that nearly 47,400 Norfolk residents live in an area classified as being within the ten percent most deprived areas in England. Norfolk is the most deprived county in the East of England based on most indicators. Great Yarmouth has the highest proportion of its residents living in an area measured as being within the most deprived ten percent in the country, at 22%; the figure for Norwich is 9% and King's Lynn is just under 8%.

Figure 5-2: Index of Multiple Deprivation in Norfolk

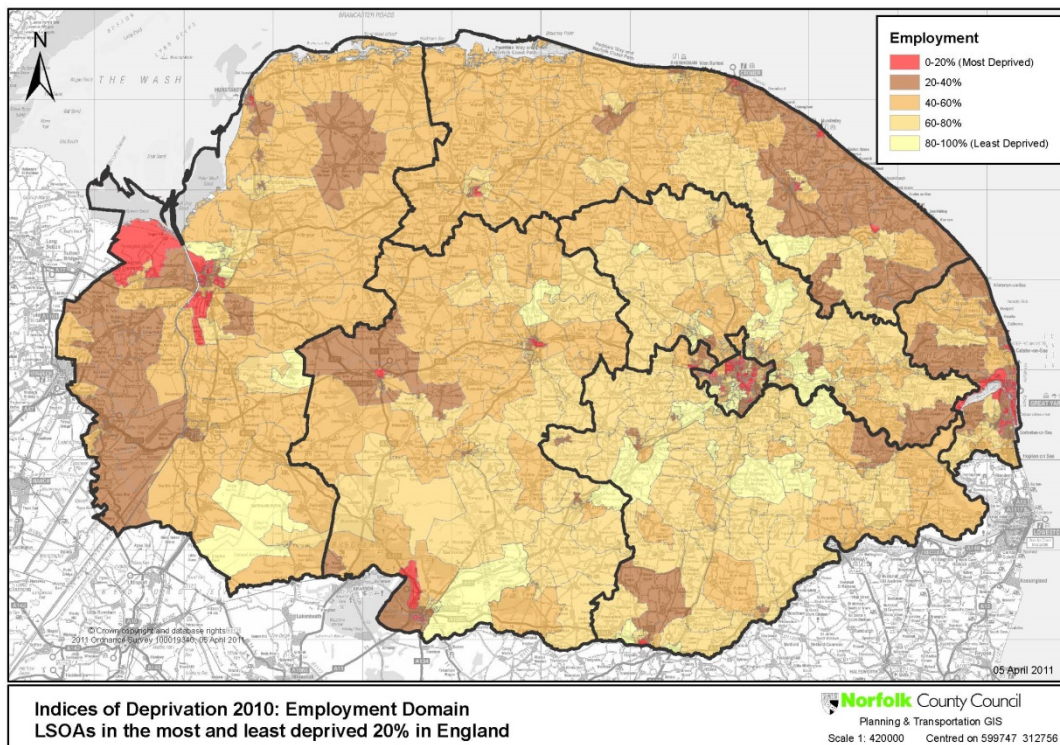


Norfolk has been described as the most self-contained employment area in the East of England. Norfolk is a rural county and agriculture is the dominant land use. However, the majority of jobs in Norfolk are located in urban areas, with agriculture only accounting for half a percent. The mining, quarrying and utilities sector, accounts for just over 1% of the jobs in Norfolk, with construction employing a further 6.1%.

In Norfolk, in 2007, 6.2% of the LSOAs were in the 10% most employment deprived nationally and is centred on urban areas as seen in Figure 5-3. This figure had changed to 6.4% (or 34 LSOAs) in 2010.

The unemployment rate for Norfolk in the period between April 2012 and March 2013 was an estimated 5.5% of the working age population. This compared favourably with a regional unemployment rate of 6.6% and a national unemployment rate of 7.8%. Youth unemployment is a significant feature in Norfolk with the 16-24 age group accounting for 44% of the unemployment totals despite only making up 13% of the working age population.

Figure 5-3: Employment Deprivation in Norfolk



5.2.4 Historic Environment

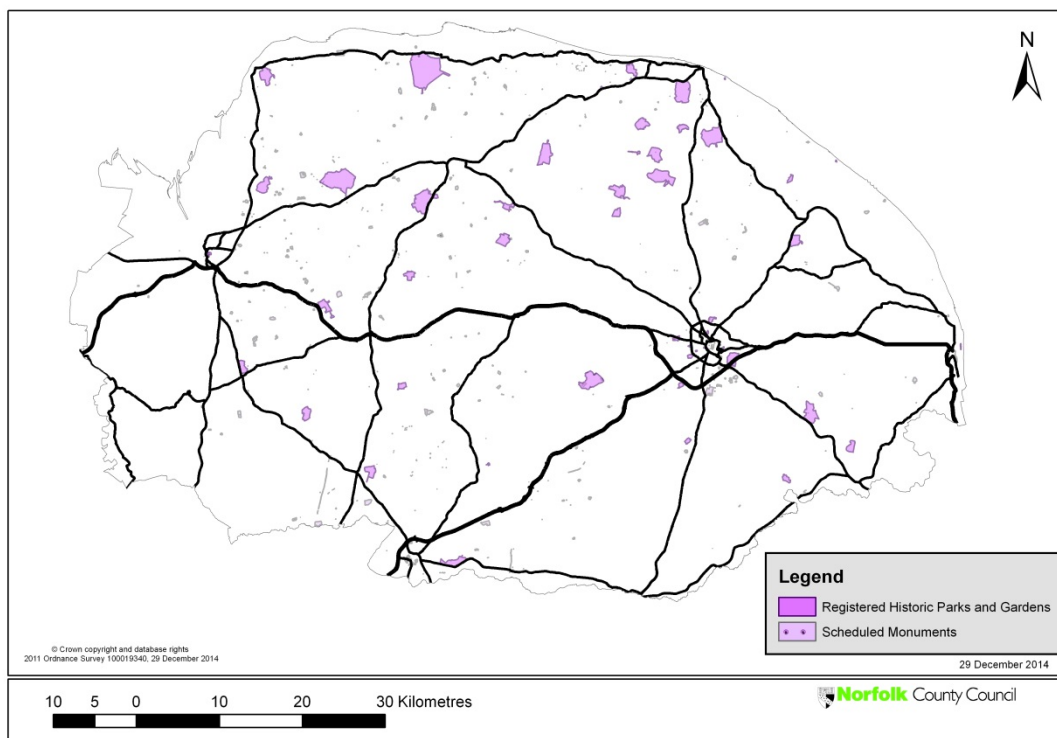
Norfolk is rich in cultural heritage which dates from the Palaeolithic period (before 10,000 BC), through prehistoric, Roman, Anglo-Saxon and Medieval times to the present day. From earliest times humans have influenced the appearance of the landscape leaving a rich heritage of historic domestic and industrial buildings, monuments and defensive structures.

Norfolk is an area of historical importance and has a rich and diverse history and culture, which can be enjoyed through its numerous architectural and archaeological sites. The spatial distribution of heritage environment designations can be viewed in Figure 5-4. Currently, 0.4% of listed buildings and 4.9% of scheduled monuments in Norfolk are at risk. Table 8 summarises the number and area of historic environment designations in Norfolk. Norfolk also contains a large number of areas in which either undesignated heritage assets or archaeological assets occur. Archaeological assets may either be known or unknown where the potential of assets is high but no field studies have been carried out. The Drainage Mills in the Broads and Fens are particularly important in these areas, and the Broads Authority Executive Area is identified as an area of Exceptional Waterlogged Archaeology.

Table 8: Historic Environment Designations

| Type | Number |
|--|--|
| Listed Buildings | 10,569 (2014) |
| Scheduled Monuments | 432 (2014) |
| Registered Historic Parks and Gardens | 51 (2014) |
| Conservation Areas | 304 (2014) (note: includes 21 Conservation Areas in Broads Authority Executive Area which are shared with other Local Authorities) |
| <p>Source: http://list.english-heritage.org.uk/ for listed buildings, Scheduled Monuments and Historic Parks and Gardens. Local Authorities in Norfolk for Conservation Areas</p> | |

Figure 5-4: Historic Environment in Norfolk



5.2.5 Biodiversity, flora and fauna, and geodiversity

Norfolk is one of the most important counties in England for its biodiversity, with a wide range of habitats including grasslands, woodlands, heathland, rivers and wetlands, farmland and coastal waters. The wider countryside also supports a considerable number of sites of local importance and has potential for habitat creation. The Norfolk Biodiversity Action Plan has individual plans and targets to conserve and enhance 61 species and 22 habitats within the county, all of which are considered to be of national importance.

Norfolk is home to numerous local, national, and international biodiversity designations (Figures 5-5 – 5-9) and is an area of high landscape quality. Table 9 summarises the number and area of the biodiversity and nature conservation designations in Norfolk.

Table 9: Biodiversity and Geodiversity Designations

| Status | Designation | Number of Sites |
|---------------|--|-------------------|
| International | Special Protection Areas | 7 |
| | Special Areas of Conservation | 12 |
| | Ramsar Sites | 8 |
| National | Sites of Special Scientific Interest | 162 |
| | National Nature Reserves | 22 |
| Local | Local Nature Reserves | 27 |
| | County Wildlife Sites | 1,326 (July 2015) |
| | County Geodiversity Sites (previously called Regionally Important Geological/ Geomorphological Sites (RIGS)) | 5 (2015) |

In terms of condition, some 96% of Norfolk’s Sites of Special Scientific Interest are in favourable or recovering condition, this is the same as the national levels. Unfavourable condition is due mostly to eutrophication, excessive nutrients, poor drainage conditions caused by water abstraction, agricultural runoff and water pollution from discharges, all of which are secondary impacts from water pollution.

Figure 5-5: Special Protection Areas (SPAs) in Norfolk

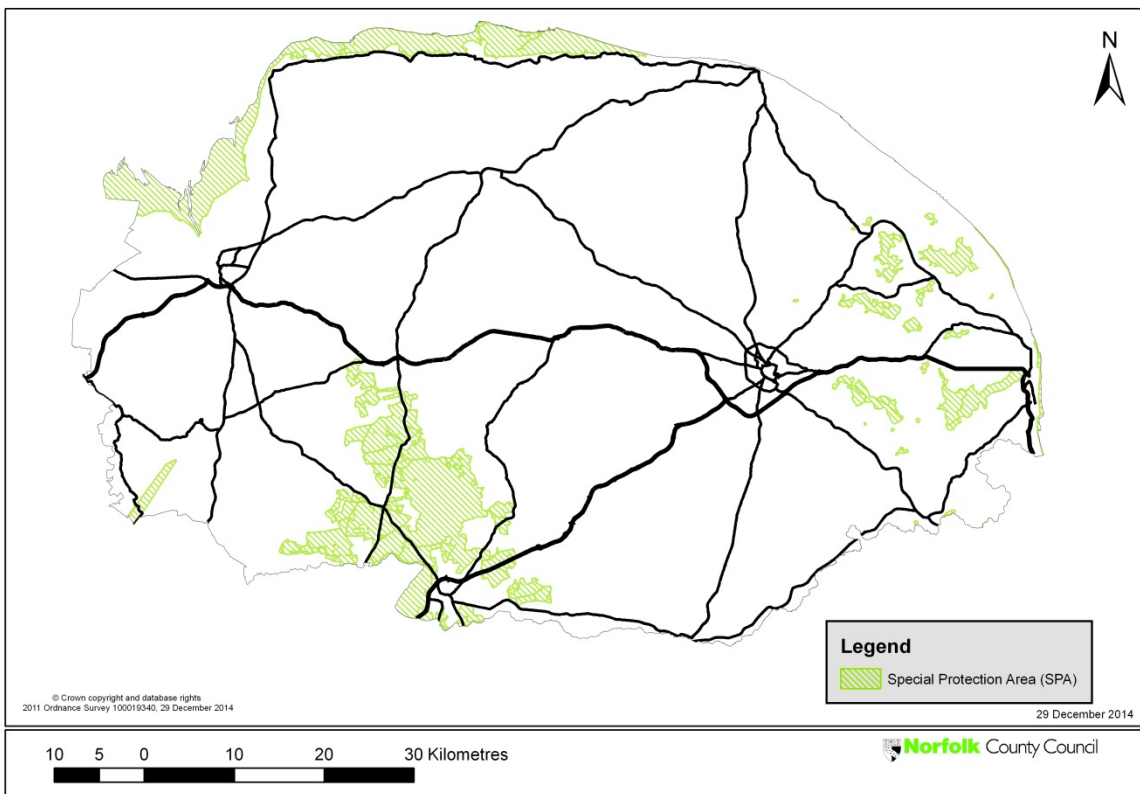


Figure 5-6: Special Areas of Conservation (SACs) in Norfolk

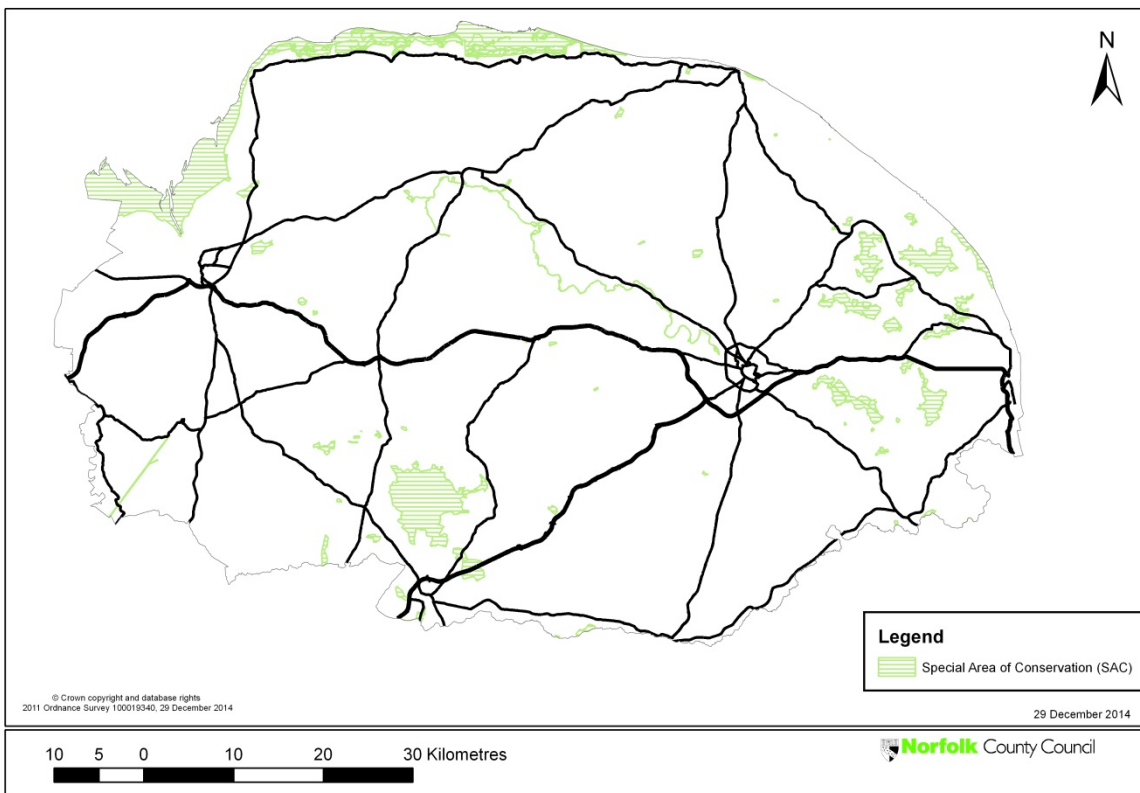


Figure 5-7: Ramsar Sites in Norfolk

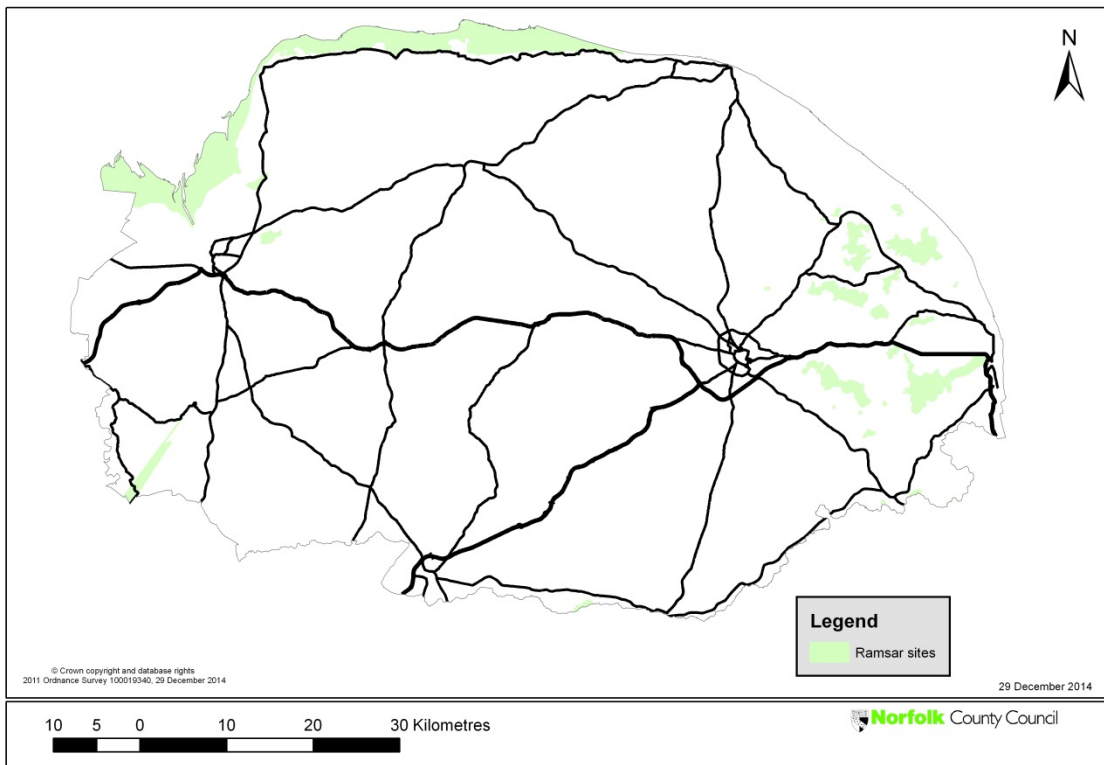


Figure 5-8: National Sites of Nature Conservation Value in Norfolk

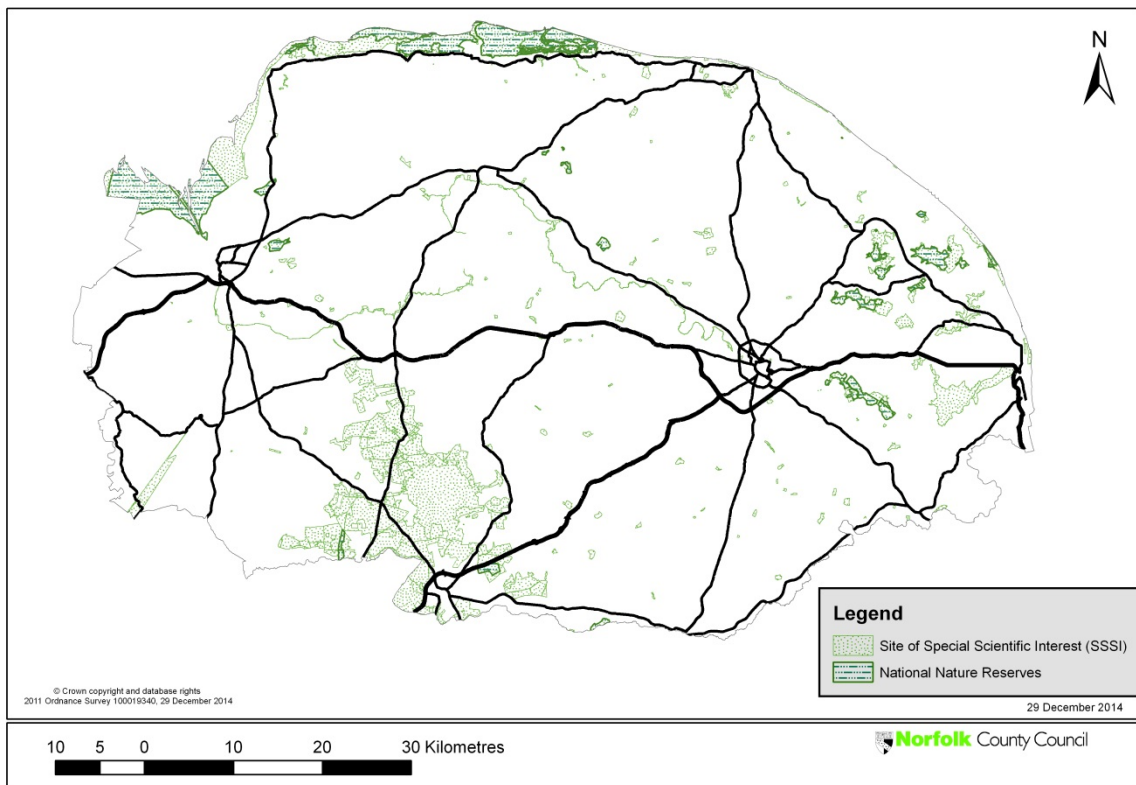
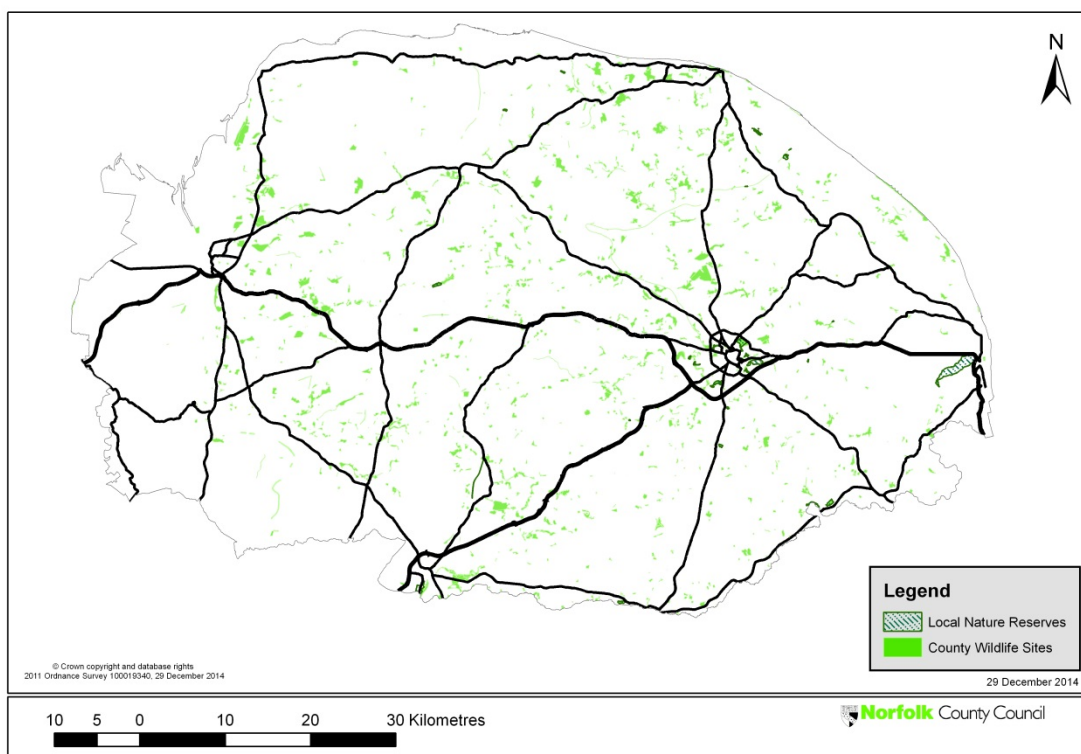


Figure 5-9: Local Sites of Nature Conservation Value in Norfolk



Norfolk is nationally important for its geodiversity, particularly sites and features relating to the story of environmental change (including fauna, flora, climate and early human occupation) over the last two million years. This period, known as the Ice Age, is important for an understanding of the background to climate change. Norfolk has important sites and features dating from the Cretaceous period, including the youngest chalk strata in Britain. It also has spectacular geomorphology, including the 40km stretch of coastal landforms on the north coast. Many of these sites and features have been designated under the Geological Conservation Review as geological or geomorphological SSSIs, and Norfolk has the highest percentage of such sites in the East of England (33%).

A Geodiversity Action Plan (Norfolk's Earth Heritage- valuing our geodiversity, 2010) has been completed to co-ordinate the non-statutory conservation of the county's geodiversity, and over 225 sites have been identified for possible RIGS designation.

Table 10: Geodiversity Designations

| Status | Designation | Number of Sites | Area (ha) |
|----------|----------------------------------|-----------------|-----------|
| National | SSSI | 37 | 8910 |
| Local | County Geodiversity Sites (RIGS) | 5 | 12.1 |

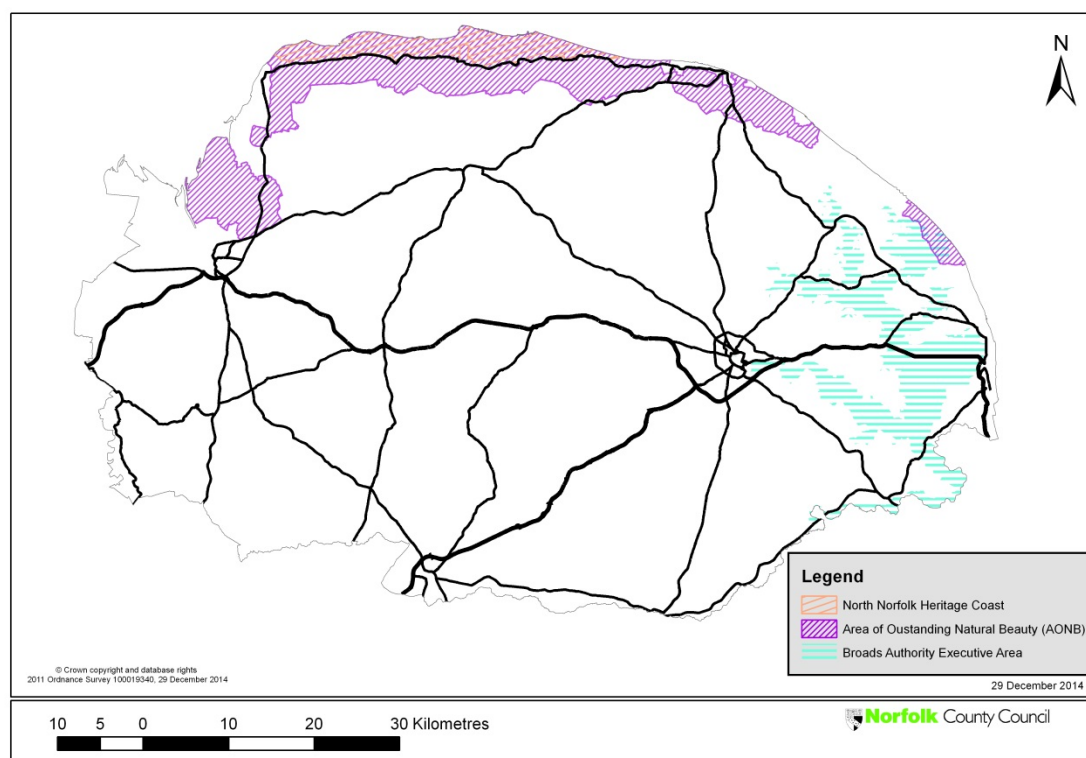
There are a range of threats to Norfolk's geodiversity, particularly to the integrity of finite landforms such as river terraces and floodplains and to finite geological resources, including interglacial deposits that are often spatially restricted.

5.2.6 Landscape and Soil

Norfolk is predominantly rural in its nature and the integrity of the landscape and countryside is an important aspect of quality of life for Norfolk residents. Minerals and waste development can threaten the character and integrity of Norfolk's landscape if it is not appropriately designed to respect landscape character. Many types of waste management facility are considered appropriate to locate on industrial and employment land.

Within the county, the Broads Authority Executive Area, the Norfolk Coast Area of Outstanding Natural Beauty and the Heritage Coast are protected by national designations and are some of the most prized landscapes in England (Figure 5-10).

Figure 5-10: Landscape Designations in Norfolk



The wider countryside supports a considerable number of sites of local landscape importance. Norfolk's countryside is predominately agricultural in character, containing diverse landscapes that reflect the local variation in physical factors. The area to the east and north of Norwich contains generally excellent to very good soils. The area known as the Brecks surrounding Thetford contains generally poor or very poor soils. The Fens to the west of King's Lynn contain virtually entirely excellent or very good soils. The majority of the remaining soils in Norfolk are moderate to good quality. 78.6% of the area is classified as good or better agricultural land grade 3 or above (Figure

5-11). The Agricultural land classification divides land quality into 5 grades : 1 – Excellent, 2 – Very Good, 3 – Good to Moderate, 4 – Poor, 5 – Very Poor.

Norfolk's varying landscapes are underlain by an intricate mosaic of different soils which has been mapped by the Soil Survey. Soil variability is principally as a result of the variable nature of the underlying geology, in particular the superficial geology. The majority of Norfolk's superficial geology has been shaped by glacio-fluvial actions. Soil quality to a great extent depends on the energy of the deposition event which laid down the superficial geology at a given site, the larger the material size the greater the energy required to transport it.

High energy environments such as glacial outwash deposits, or storm terraces, will generally contain greater proportions of stone, often in the form of gravel or cobble close to the site of the event; this diminishes over distance. These types of deposit often contain sand as the next most significant proportion, followed by silts and clay at variable proportions. Low energy deposition environments, such as river and estuarine locations, contain low levels of stone and sand in relation to silts and clays. High energy events are generally short-lived compared with low energy events.

The superficial geology is directly linked to soil quality in a number of ways; stoniness and droughtiness are principal indicators of soil quality. Therefore soils derived from an underlying geology deposited in high energy environments are more likely to score adversely for these indicators, as a result of the high proportions of sand and gravel. Due to the nature of the events these areas are also more likely to contain a more varied topography, and slope is another indicator used in determining agricultural land quality.

Mineral extraction may impact on soils through loss of farmland, and increasing run-off and siltation in rivers. Norfolk's soils support varied wildlife habitats and play a vital role in agriculture; peat soils play a significant role in sequestering atmospheric carbon. Soil conservation is an important issue in Norfolk and is partly addressed through the grading of agricultural land. The county's soils are threatened by erosion; contamination; destruction of soil profiles and structure; drying out and shrinkage of peat; acidification and ochre accumulation. Such issues are addressed by Natural England, the Environment Agency and FWAG, and by the Norfolk Geodiversity Action Plan.

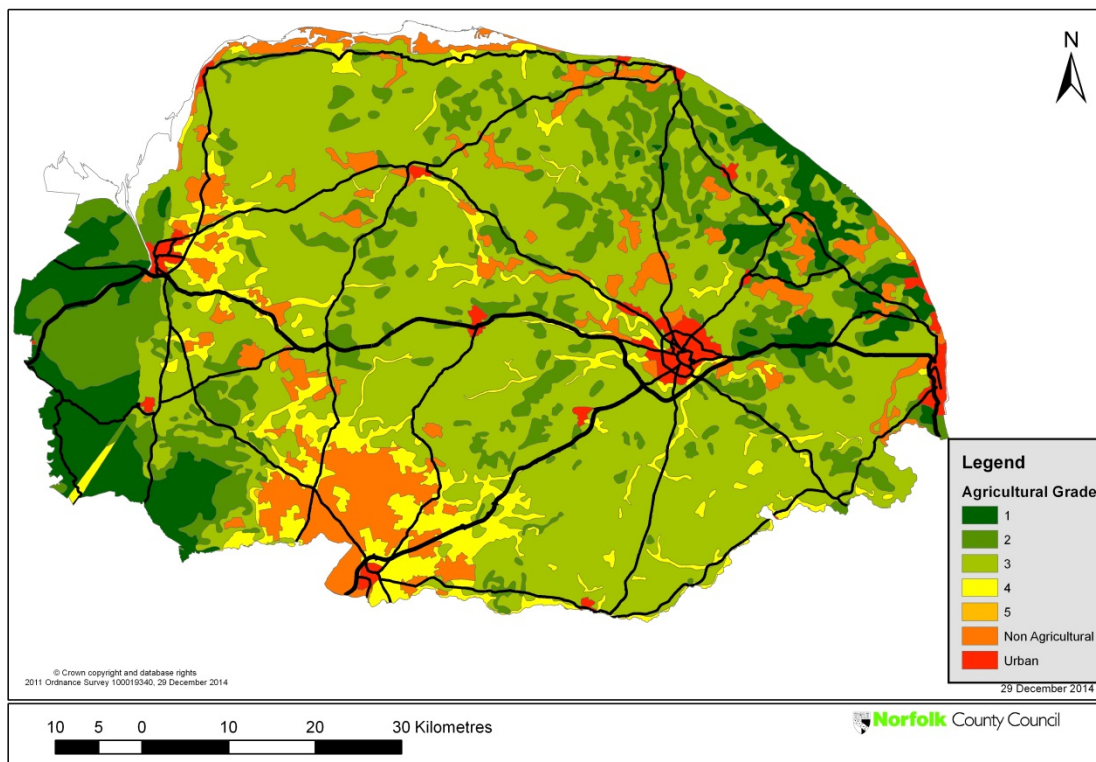
River valleys have been a traditional source of sand and gravel in Norfolk and many have experienced incremental growth in a number of water areas over a number of years which has changed their character. The intention is to direct new exploration and mineral development away from these areas, as detailed in adopted Minerals and Waste Core Strategy policy DM2 - Core River Valleys.

Development in these areas not only has adverse effects on landscape, but also has the potential to adversely affect flood risk, soil and water quality.

In recent years, concern has grown about the gradual degradation of both the countryside and urban environment through changing farming practices, drainage of wetlands, increased pressure from transport and the need for new housing and other development. There has been loss of biodiversity and landscape as a result of growth, development and road construction. Rural

tranquillity is rapidly being eroded due to growth and transport pressures which also lead to loss and fragmentation of habitats.

Figure 5-11: Agricultural Landscape Classifications in Norfolk



5.2.7 Human Health

The National Planning Policy Framework addresses human health as part of sustainable development, building on the UK Sustainable Development Strategy, with guiding principles including “ensuring a strong, healthy and just society”. In the NPPF three dimensions are described for sustainable development: economic, social and environmental. The social role includes a requirement for the planning system to support strong, vibrant and healthy communities. The planning system should meet this requirement “by providing the supply of housing required to meet the needs of present and future generations; and by creating a high quality built environment, with accessible local services that reflect the community’s needs and support its health, social and cultural well-being”.

Minerals and waste facilities can, if not correctly managed, adversely affect human health in a number of ways, from contaminating local soil and water, to dust and air emissions from operations and transportation of minerals and waste. The UK has a significantly more robust regulatory framework for managing emissions from minerals and waste facilities than many other countries, and the climate and scale of operations is often significantly different. Therefore, it is often inappropriate to compare mineral and waste operations from other countries with UK operations.

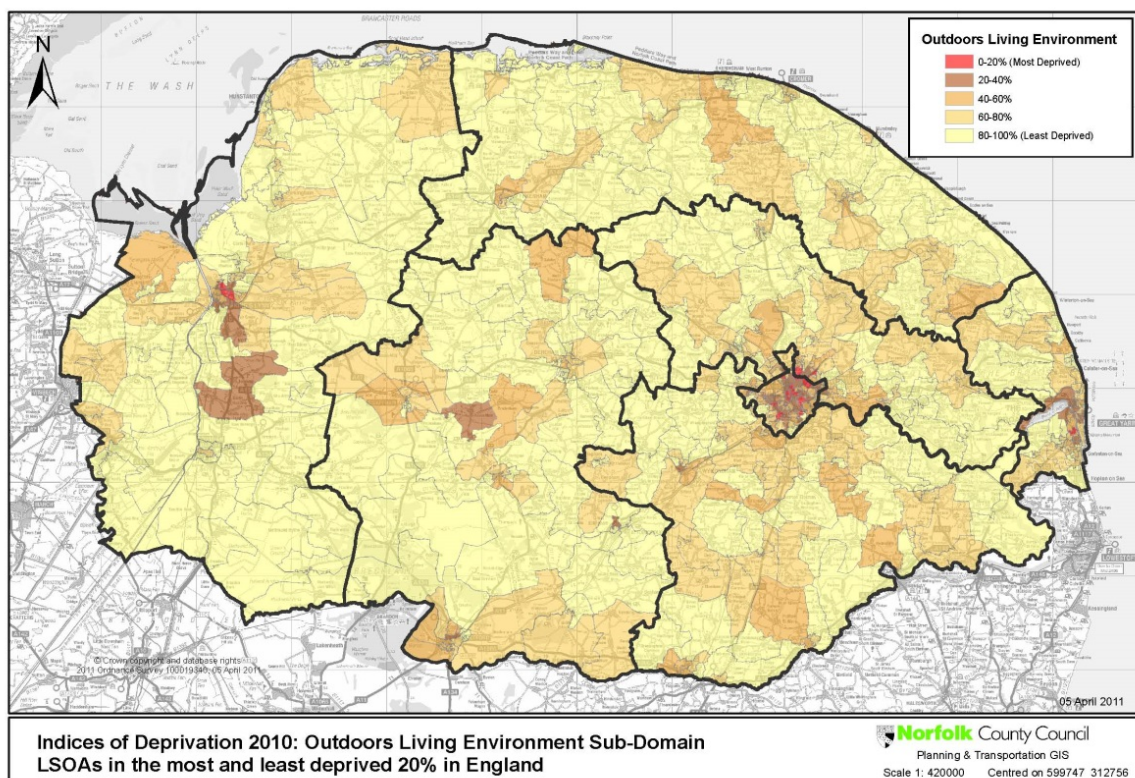
Human health components look at a wide range of conditions to measure and establish the baseline, including health and outdoors living environment deprivation.

Air quality also plays a significant role in human health, and regulations are based on concentrations considered safe for human health. There is growing evidence regarding the effects of pollutants from road transport and industry on human health. Air pollution is a potential hazard to the population as a whole, but in particular to vulnerable groups including pregnant women, the elderly, those suffering from respiratory and coronary illnesses, children and workers with high occupational pollution exposure levels. Reductions in air quality from increased air pollution concentrations may cause respiratory problems for local residents. The English indices of deprivation 2010, contains a sub-domain for 'outdoors' living environment which uses as indicators:

- Nitrogen dioxide indicator (component of air quality index)
- Particulates indicator (component of air quality index)
- Sulphur dioxide indicator (component of air quality index)
- Benzene indicator (component of air quality index)
- Air quality indicator
- Road traffic accidents indicator.

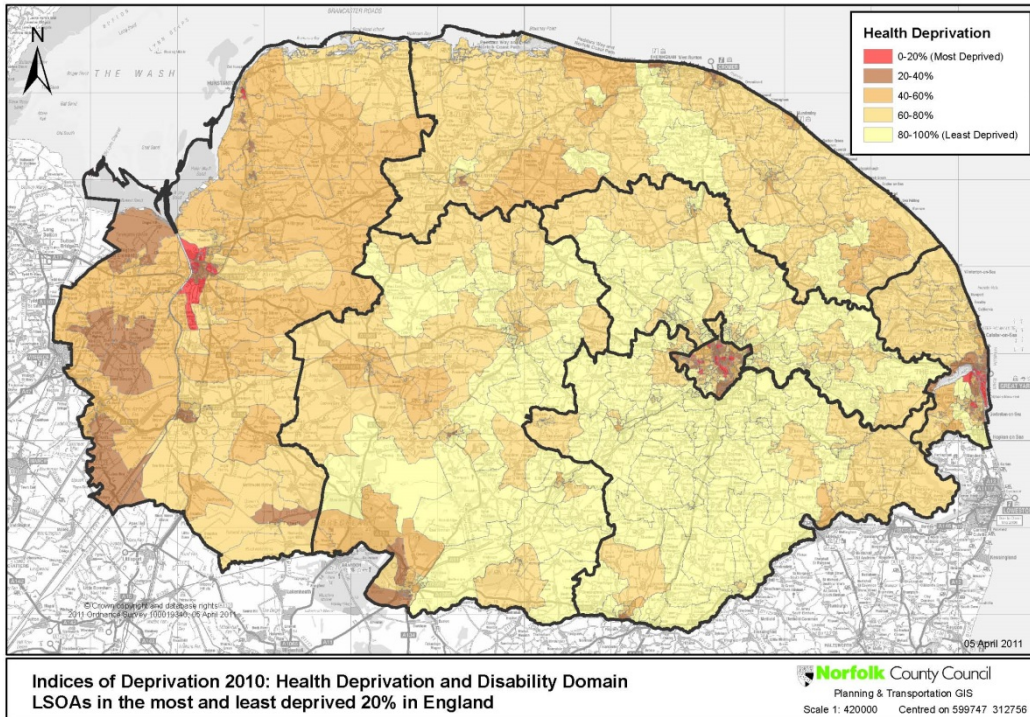
Air quality is discussed in more detail in Section 5.2.2; however it can be seen from Figure 5-12 that areas of greater deprivation based on this sub-domain are in urban areas, reflecting the impact of road traffic on air quality.

Figure 5-12: Outdoors Living Environment Deprivation in Norfolk



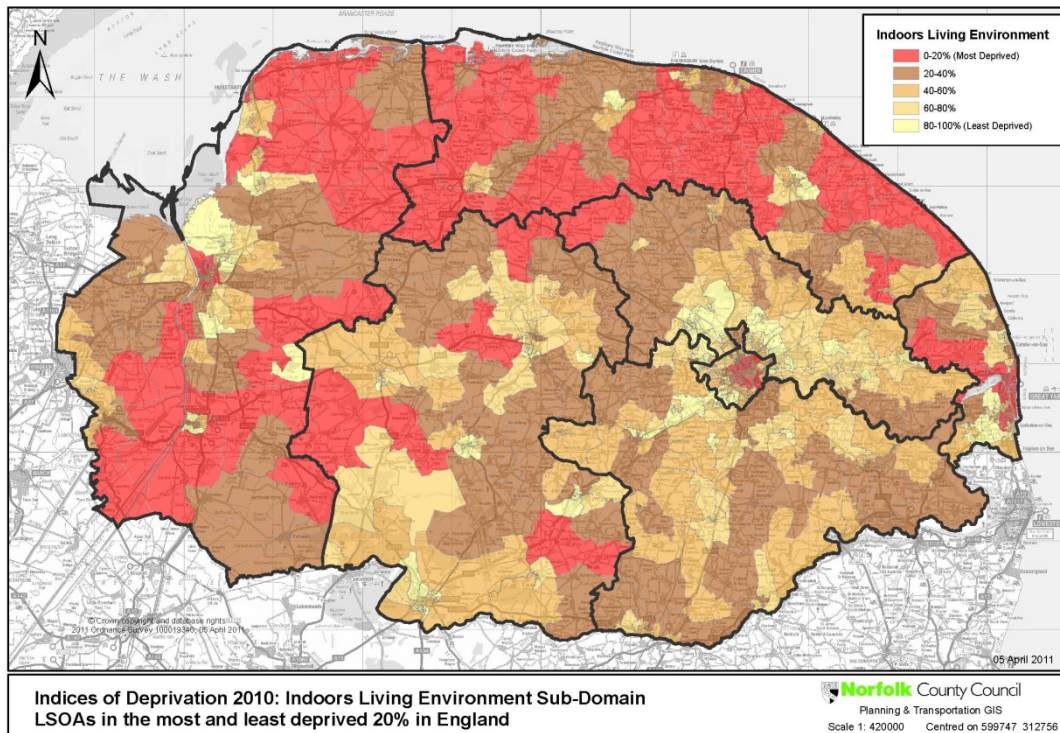
In 2007, there were 10 (or 1.8%) of lower super output areas in Norfolk that ranked within the worst 10% nationally for health deprivation and these can be seen in Figure 5-13. Health deprivation has been identified as an issue in Norfolk in the urban areas of King's Lynn, Norwich, and Great Yarmouth. In 2010, 13 (or 2.45%) of LSOAs in Norfolk were within the worst 10% nationally for health deprivation.

Figure 5-13: Health Deprivation in Norfolk



Indices of deprivation include a sub-domain for 'indoors' living environments. This category refers to the quality of housing, using housing in poor condition and housing lacking central heating as indicators. The 'indoor' and 'outdoor' sub domains are combined to form a living environment domain. In 2007, 3.4% of lower super output areas in Norfolk ranked within the worst 10% nationally for living environment deprivation (Figure 5-14). In 2010, 3% (16) of LSOAs ranked within the worst 10% nationally for living environment deprivation.

Figure 5-14: Indoor Living Environment Deprivation in Norfolk



5.2.8 Water Quality and Flood Risk

Historically, there was concern that minerals and waste development could have significant negative effects on water resources, from high levels of usage and abstraction, to ground and surface water contamination from diffuse and point sources, to altering patterns of drainage and increasing flood risk. However, UK legislation and policy now provides a robust regulatory framework to ensure protection of water quality and to ensure that flood risk is not negatively affected by development either at the site or downstream.

Patterns of mineral extraction in Norfolk have changed significantly over the last thirty years, with extraction in river valleys now being discouraged and greater utilisation of mineral resources from glacial formations. This has led to a reduction in the formation of water bodies in valleys as a result of mineral extraction which could change flow rates downstream. It should be noted that in some instances with a well-designed restoration scheme there is the opportunity for mineral extraction to increase flood storage areas which positively improve flood risk downstream.

On some mineral extraction sites high groundwater levels mean that some parts of a working need to be 'dewatered'. Dewatering is where water is pumped out of a working to artificially lower the groundwater so that working can take place. The Environment Agency and the Mineral Planning Authority require a 'hydrogeological risk assessment' to support planning applications for mineral extraction which involves dewatering to ensure that the working will not adversely affect groundwater levels or quality. The washing of mineral requires significant amounts of water; however modern plants use a series of lagoons to remove suspended material from the water so that it can be re-used in the washing plant many times. The use of lagoons reduces the likelihood and quantity of water that may need to be abstracted; all

abstractions over a daily volume threshold require an abstraction license issued by the Environment Agency following assessment.

Waste development is also far more strictly regulated now than in the past. UK legislation requires waste operations not to discharge pollutants to surface or groundwater. As an example, historically landfill sites were unlined and leachate (liquid emitting from the waste) was allowed to disperse into the groundwater to dilute it to levels below those thought to cause harm. Current legislation, which has been in force for a number of years, requires landfills to be engineered so that they are sealed to groundwater, to prevent leachate entering the groundwater. The Environment Agency would also need to assess the extent to which any impermeable barrier would block groundwater flows. Capping with impermeable material on finished landfill sites reduces the amount of rainwater entering the waste. Excess leachate is required to be collected and sent to an appropriate treatment facility as part of the ongoing management of closed landfills.

Water Quality

There has been a long-running problem with silt and soil entering rivers including within Norfolk, which builds up and increases the risk of local flooding. Silt infiltration is compounded by low summer river flow rates

Rivers provide a habitat for aquatic biodiversity, some of which require low levels of silt to survive. Silt and mud causes lasting damage if it enters rivers by:

- Smothering important fish and insect habitats;
- Destroying fish spawning sites;
- Affecting aquatic plant growth, which then limits the oxygen supply in the water;
- Building up in the river to increase the risk of flooding.

Agricultural practices have played a significant role in silt infiltration into rivers. Livestock accessing water have caused bank degradation and 'puddling' of mud on the low lying bankside. Ploughing and other machine use close to the bankside have similarly caused problems with silt and soil. These practices have been improved through such measures as leaving an uncultivated strip close to the riverbank which reduces windblown soil and bank damage.

Historically, mineral extraction also contributed to silt infiltration, however changes to the location of mineral extraction from river valleys and the discharge from workings as the result of 'dewatering' to lagoons for settlement prior to discharge to a watercourse has significantly reduced the issue.

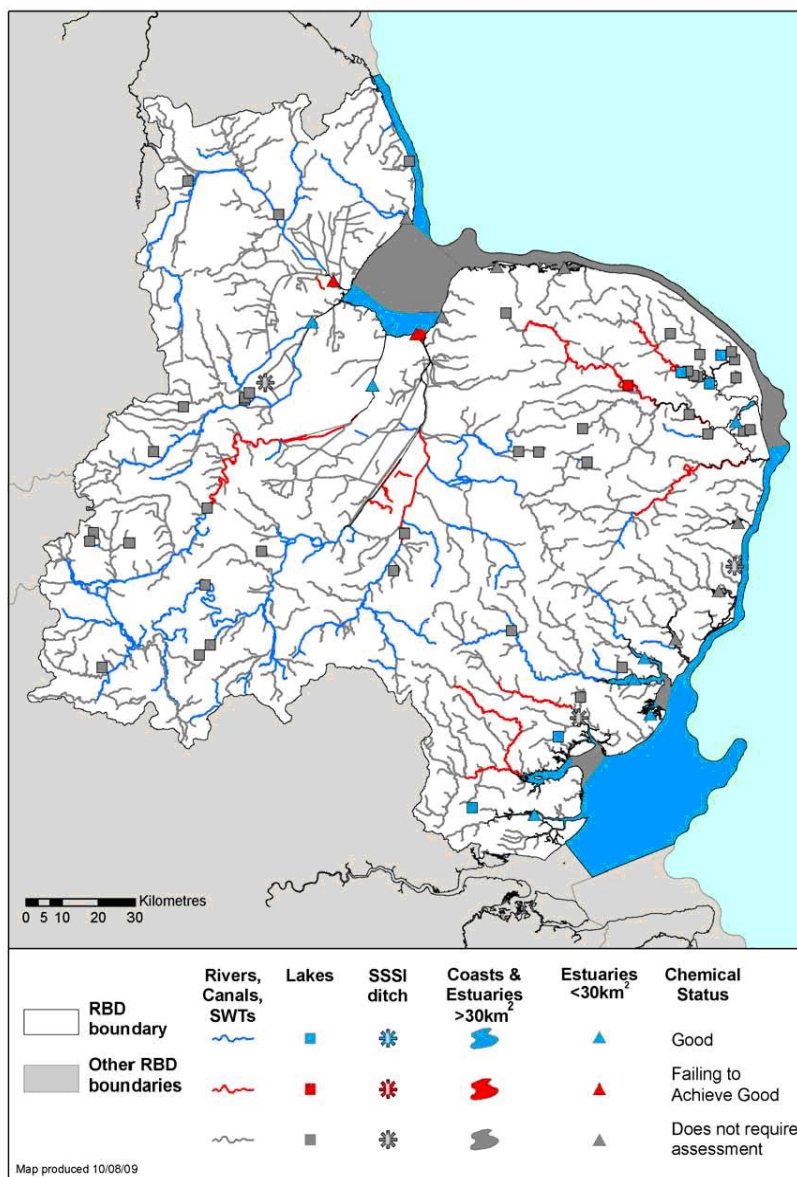
Under the Water Framework Directive, the Environment Agency has classified Norfolk's surface water bodies in terms of their ecological and chemical status. In total, only 18% of watercourses meet 'good' status or better; the main reasons for not meeting 'good' status are because of the 'phosphate', 'fish' and 'invertebrate' elements of the classification. In essence, fertiliser runoff enriching water bodies, over-abstraction and morphological alteration to water bodies have all contributed to the low level of 'good' status water bodies.

Figure 5-15: Surface water bodies ecological status in Anglian river basin (2009)



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Figure 5-16: Surface water bodies chemical status in Anglian river basin (2009)



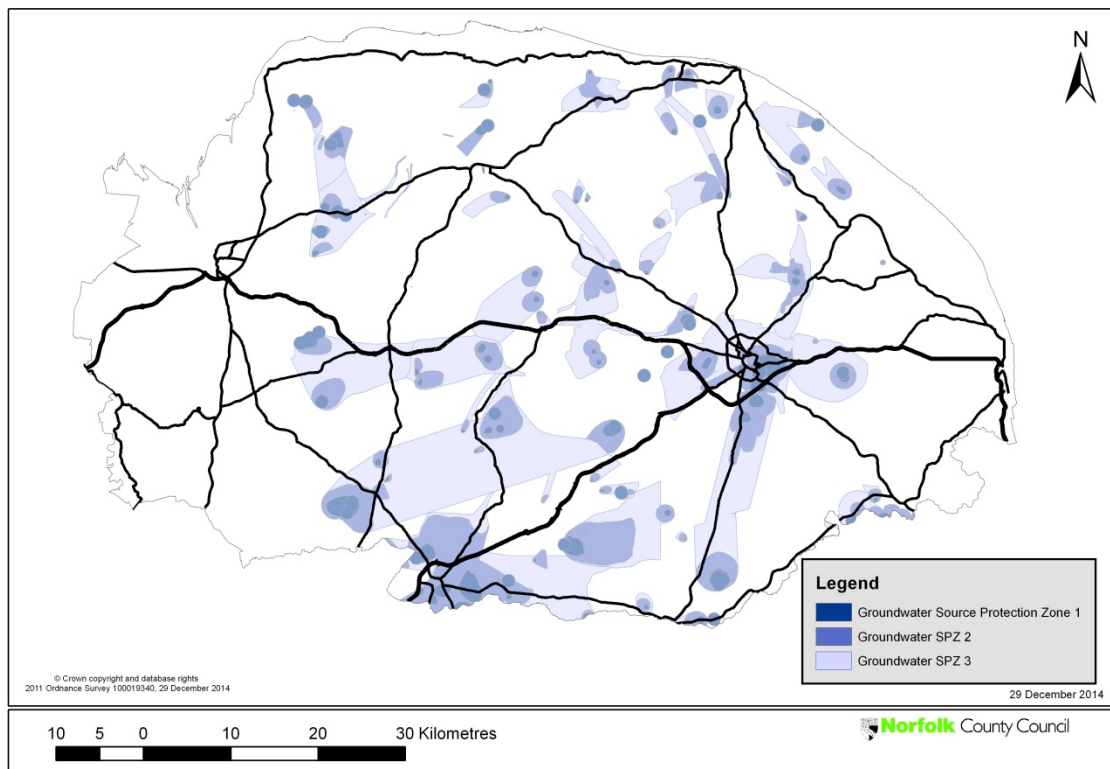
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Groundwater

A significant proportion of the county is covered by Groundwater Protection Zones - areas surrounding groundwater sources such as wells, boreholes and springs used for public drinking water supply. These zones show the risk of contamination from any activities that might cause pollution in the area (Figure 5-17). Groundwater Source Protection Zones are defined by the Environment Agency and are based on the number of days taken by any pollutant to follow to the borehole. Source Protection Zone 1 is defined as a zone within which any contamination would reach the borehole within 50 days. This applies to groundwater at and below the water table. This zone also has a minimum 50 metre protection radius around the borehole.

Adopted Minerals and Waste Core Strategy Policy DM3 – Groundwater and Surface Water requires assessment of development proposals for minerals extraction and waste management facilities in accordance with the Environment Agency's 'Groundwater Protection: Policy and Practice (GP3)' document.

Figure 5-17: Groundwater Protection Zones in Norfolk

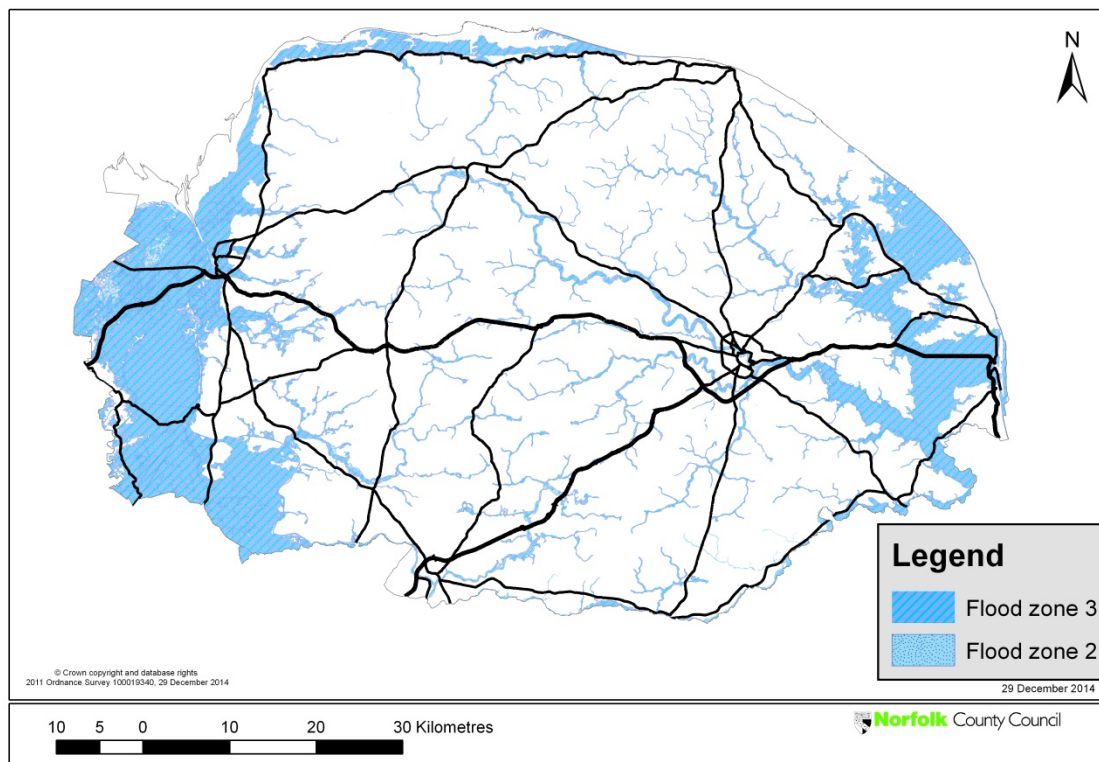


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Flood Risk

As Norfolk is low-lying, coastal, and home to a series of inland water and lakes; flood risk is of particular concern throughout the county. The effects of climate change are likely to increase these risks. Areas at risk of flooding from rivers and the sea can be viewed in Figure 5-18.

Figure 5-18: Flood Risk in Norfolk



Norfolk's Local Planning Authorities have produced Strategic Flood Risk Assessments for their areas, to assess the risk of flooding from all sources, now and in the future, taking account of the impacts of climate change and to assess the impact that land use changes and development in the area will have on flood risk. The Environment Agency is responsible for managing flood risk from rivers and the sea, whilst Norfolk County Council, as the Lead Local Flood Authority, is responsible for co-ordinating the management of local flood risk from groundwater, surface run-off and ordinary watercourses (for example small streams and drainage ditches).

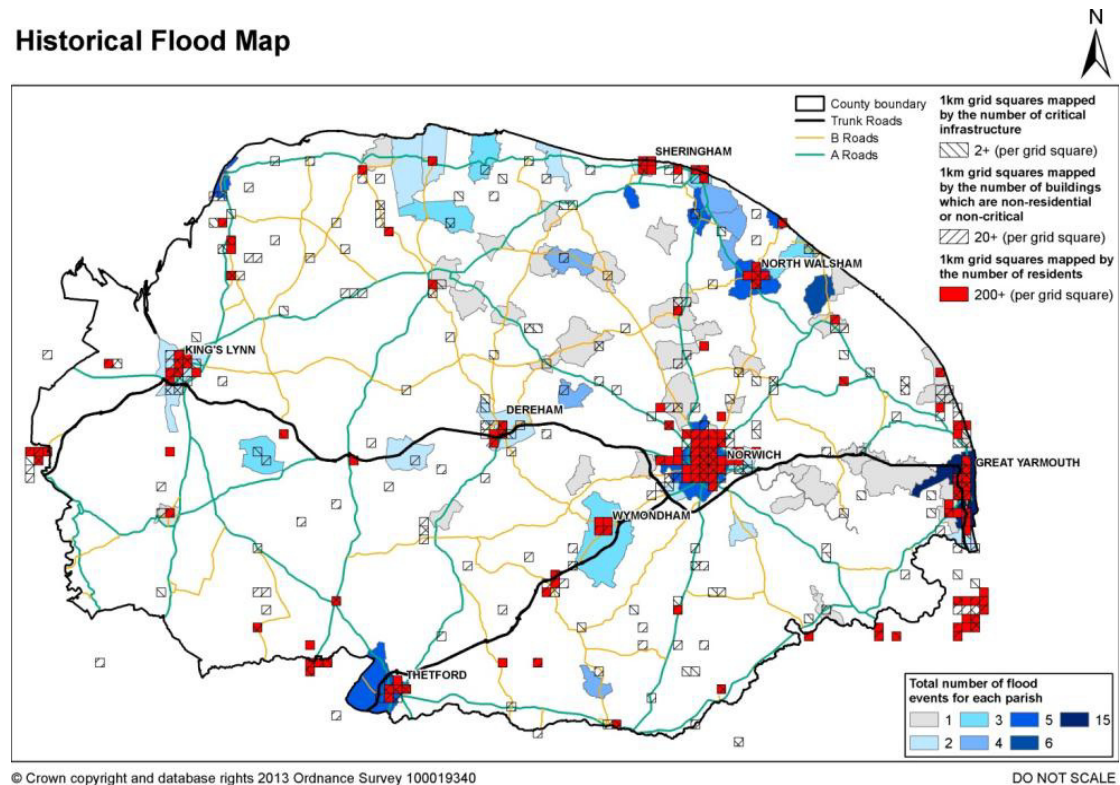
Surface water flooding happens when the ground, rivers and drains cannot absorb heavy rainfall. Typically, this type of flooding is localised and happens very quickly after the rain has fallen. Surface Water Management Plans (SWMPs) have been produced for Great Yarmouth and the Norwich Urban Area. A SWMP for King's Lynn and West Norfolk Settlements is planned to be published in 2015 and work is underway for a SWMP for South Norfolk District.

Norfolk County Council is also in the process of preparing a Local Flood Risk Management Strategy to identify the extent of local flood risk in Norfolk, how it will be managed in partnership with others and to outline Norfolk County Council's approach to local flood risk management.

In July 2011 Norfolk County Council published a Preliminary Flood Risk Assessment which identifies those areas in the county at risk of flooding with significant consequences (Flood Risk Areas). The PFRA collated and summarised local historical flood information from twelve years.

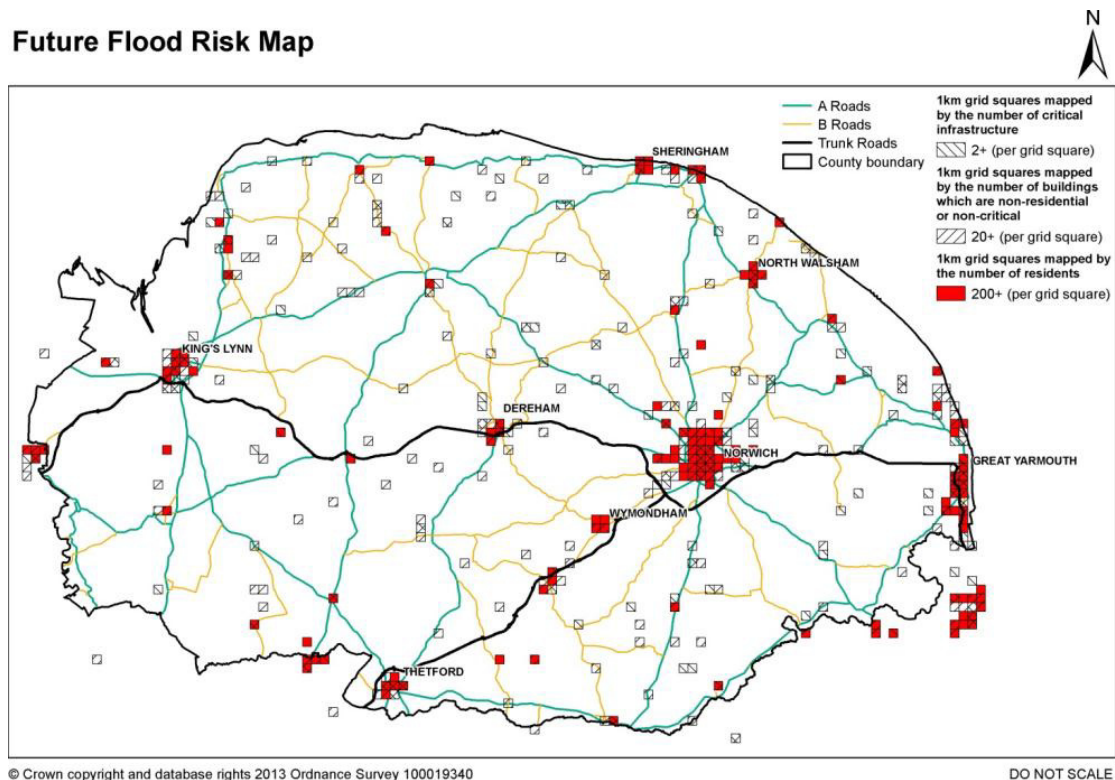
Figure 5-19

Historical Flood Map



The PFRA also produced a locally agreed priority list of settlements to provide a consistent basis for prioritising local Future Flood Risk. The top thirty nine settlements are grouped into four priority bands, based primarily on the potential numbers of people at risk from flooding. See figure 5-20 below for the Future Flood Risk Map.

Future Flood Risk Map



5.2.9 Material Assets

Minerals extraction and associated activities and waste management facilities provide a host of material assets for the county. There are currently over 40 minerals extraction sites and over 130 waste management sites active in Norfolk. Both minerals extraction and waste management facilities will be required to support growth, through the supply of building materials and handling of construction and demolition waste, through to the need to manage commercial, industrial and local authority collected waste, including household waste, more sustainably.

Minerals extraction and development within Norfolk includes sand and gravel, crushed rock (carstone) and silica sand as well as secondary and recycled aggregates. The production of aggregates is directly dependent on activity within construction, infrastructure and related industries and it is therefore important that there is a steady and adequate supply of aggregates.

Sand and gravel production in 2013 was 1,114,935 tonnes, representing a decrease of 2% on the 2012 figure (1,131,941). Production of sand and gravel continues to be well below the high levels of the late 1980s and early 1990s and below the average for the last twenty years of about 2.21 million tonnes (mt) per annum. **The average over the last 10 years was 1.71 million tonnes per annum.** The National Planning Practice Guidance (NPPG) states that the 10 year average should be used in the calculation of aggregate landbanks. **The rolling 3 year average is 1.18 millions tonnes per annum.** This highlights a continuing downward trend in recent years. The NPPG suggests the use of 3 year average figures to indicate recent trends in sales.

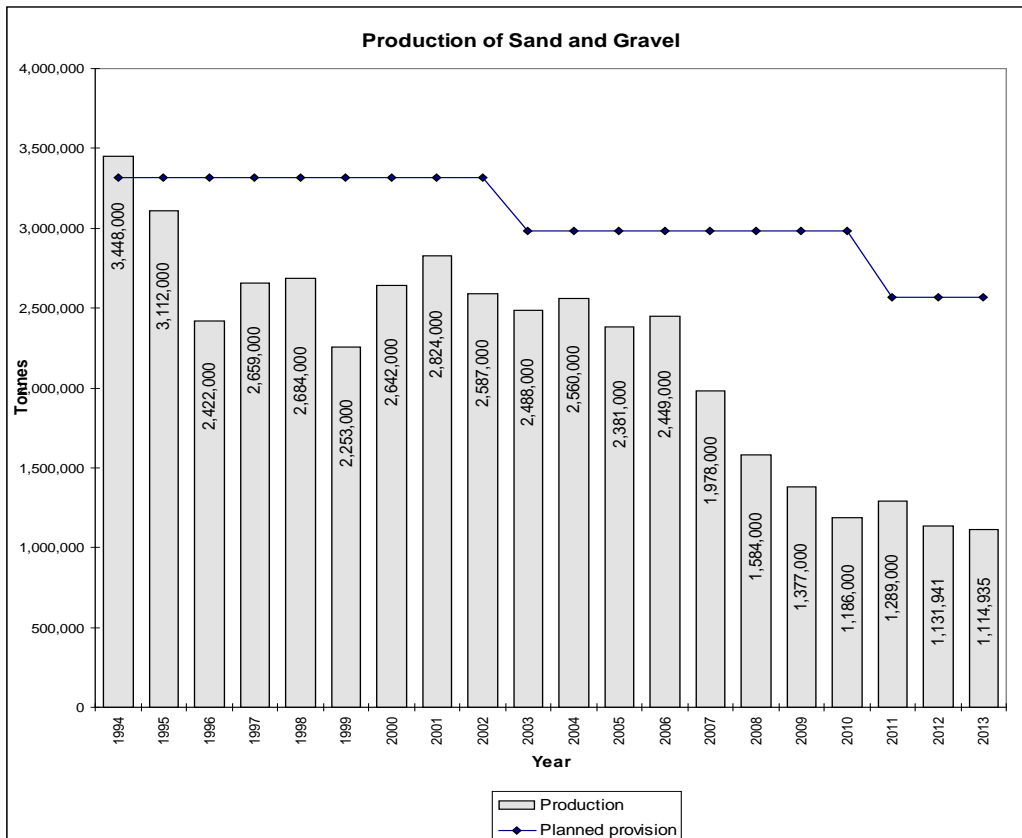
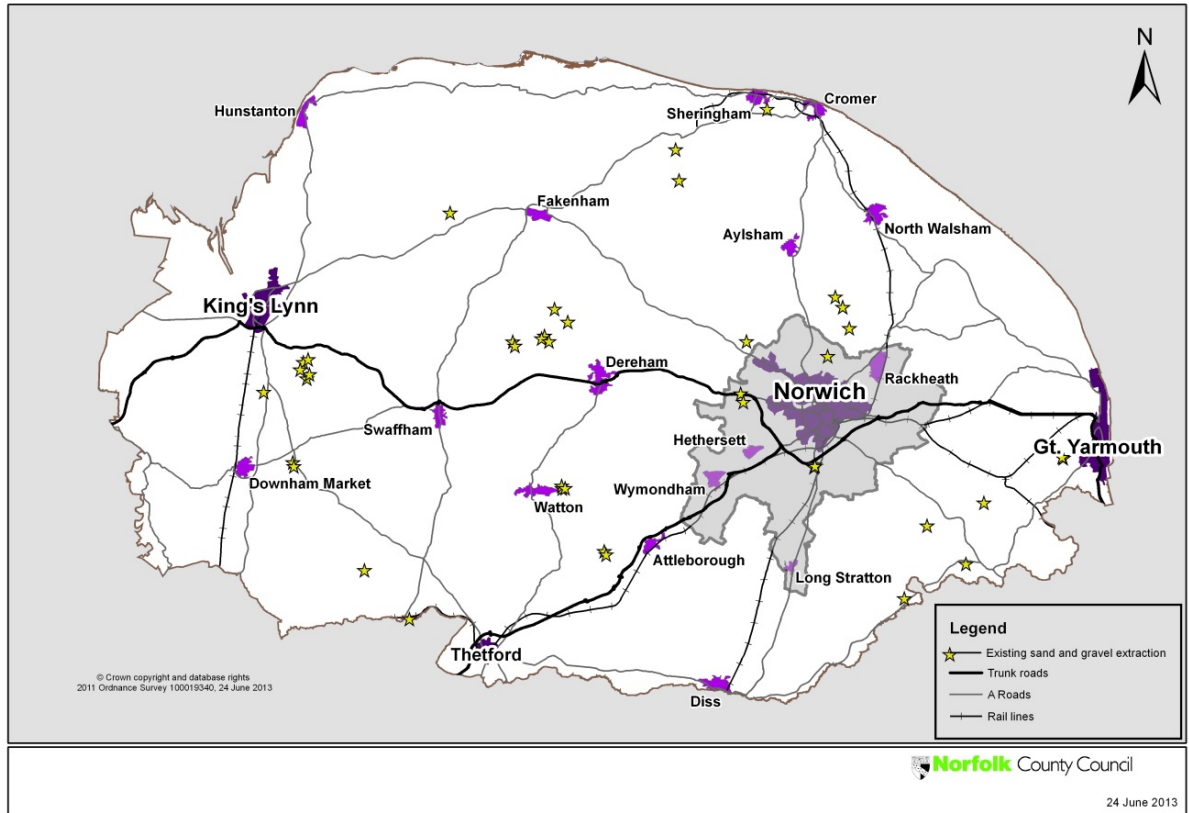


Figure 5-21 Sand and gravel extraction in Norfolk in 2013



Reserves of sand & gravel at 31 December 2013 were 13,335,398 tonnes, a decrease of 8% on the 2012 figure. The landbank of permitted reserves at 31/12/2013, based on the 10 year average in the NPPF, was 7.8 years, and therefore within the range for the landbank of between 7 and 10 years, indicated in Policy CS1. The landbank was therefore also above the “at least 7 years” landbank that the NPPF states should be maintained for sand & gravel. The Mineral Site Specific Allocations DPD allocated 26 sites for sand and gravel extraction. The estimated resource for the 26 sites was 27.51mt.

Carstone production in 2013 was 37,193 tonnes, representing a decrease of 69% over the 2012 figure (118,288 tonnes). This is substantially below the average for the last twenty years (206,000 tonnes) and the average for the last ten years (**123,000 tonnes**). The NPPG states that the 10 year rolling average should be used in the calculation of aggregate landbanks. The rolling 3 year average is 72,600 tonnes per annum. This highlights a downward trend in recent years. The NPPG suggests the use of 3 year rolling average figures to indicate recent trends in sales. Reserves of Carstone at 31 December 2013 were 1,841,470 tonnes and the landbank of permitted reserves at 31/12/2013, calculated on the 10 year rolling average sales, as set out in the NPPF was 14.9 years. This is above the “at least 10 years” landbank that the NPPF states should be maintained for crushed rock. The carstone extraction sites are at Middleton and Snettisham.

The 10 year average **silica sand** production for the Leziate site in Norfolk, for 2005-2014 was 636,500 tonnes. This represents a landbank of 5.5 years’ worth of permitted silica sand reserves based on the 10 year average figure, this is less than the “at least” 10 years for individual silica sand sites required in the NPPF. The three year average of silica sand extraction in Norfolk from 2012-2014 was 790,400 tonnes. This is an increase on the previous three year average (from 2011-2013) of 777,100 tonnes. This increase in production is as a result of an increased demand for Leziate sand as silica sand sites in other parts of the country reach the end of their working lives. The silica sand reserve at 31/12/2014 was estimated at 3.5 million tonnes. No planning applications have been submitted for silica sand extraction so far in 2015. The Minerals Site Specific Allocations Plan allocated a site (MIN 40) for silica sand extraction; this site contains an estimated resource of three million tonnes. This represents a shortfall based on the amount planned for in Core Strategy Policy CS1 which was based on a forecast production volume of 750,000 tonnes per annum.

Waste management facilities

There are a number of waste management facilities within Norfolk. They include:

- 20 Household Waste Recycling Centres, provided by Norfolk County Council, which accepted nearly 66,000 tonnes of waste in 2013/14.
- Norfolk has seven operational commercial composting facilities which received 210,000 tonnes of waste in 2013/14, as well as a few small community composting facilities;
- There are two large metal recycling facilities at Lenwade and Great Yarmouth, one metal recycling facility at King's Lynn docks and a large number of small sites accepting scrap metal or end-of life vehicles. (The majority of end-of life vehicle depollution sites have planning permission granted by the relevant district council instead of the County Council.) The metal recycling facilities received over 155,000 tonnes of waste in 2013/14;
- There are three non-hazardous landfill sites (Blackborough End, Feltwell and Aldeby) in Norfolk, but the site at Feltwell is currently inactive. These three sites have a permitted void capacity (remaining landfill space) estimated to be 5.62 million cubic metres at 31/3/2014. In 2013/14 the operational non-hazardous landfill sites in Norfolk (which were Blackborough End, Edgefield and Aldeby) received 359,000 tonnes of waste. Edgefield landfill site has since ceased operating and has been restored;
- In 2013/14 270,000 tonnes of inert waste was received at inert landfill sites (44,000 tonnes) and used in the restoration of mineral workings (226,000 tonnes).
- In 2013/14 there were 60 operational sites for the treatment and/or transfer of waste (including municipal, commercial & industrial, hazardous, clinical, construction & demolition and inert) and 25 sites for the treatment and transfer of inert waste (including construction and demolition waste) only.
- There is a renewable energy plant operated by EPR at Thetford which received over 430,000 tonnes of waste in 2013/14. The waste received at this facility is poultry litter which is burned to produce energy.

5.3 Evolution of the Sustainability Baseline

5.3.1 Sustainability Baseline Evolution

The sustainability baseline will be used to forecast to the end of the plan period in order to compare the environmental, social and economic effects of the Silica Sand Review and the Minerals and Waste Core Strategy Review against the evolution of the sustainability baseline without these reviews. The baseline scenario not only provides a basis for the prediction of environmental, social and economic effects, but will also assist in the long-term monitoring of the effects from the implementation of the Silica Sand Review and the Minerals and Waste Core Strategy Review.

Forecasting the evolution of the baseline in the absence of the reviews will also help to understand how the plan will contribute to changes in the future. This can be done by comparing the forecast evolution or the “without the plan” scenario against the predicted effects of the reviews. A section in the Sustainability Appraisal will therefore evaluate the likely changes to the sustainability baseline assuming that the plan reviews are not implemented.

Whilst the future scenario will forecast the evolution of the environment in the absence of the Silica Sand Review and Minerals and Waste Core Strategy Review, it will not, however, assume that previously adopted, draft and future plans and programmes will not continue to be implemented. SEA must assume that other adopted plans and programmes will be delivered as planned.

The most significant changes to the sustainability baseline will be borne from the planned growth allocated in Local Plans/LDFs and transport schemes identified in the Third (2011-2016) Local Transport Plan for Norfolk.

Central and local government policies require that the principle of Sustainable Development is applied to the location and design of new development. However, it is unlikely that the amount of growth allocated in Norfolk through the Local Plans/LDFs will not lead to increases in waste generated and minerals demand in the absence of the reviews. With regard to silica sand the demand for this mineral (in the form of glass sand) is indirect in relation to construction, as the demand for flat glass is driven by the building industry

5.3.2 Climate Change

“Warming of the climate system is unequivocal, and since the 1950’s, many of the observed changes are unprecedented over decades to millennia”. “It is extremely likely that human influence has been the dominant cause of the observed warming since the mid-20th century”, IPCC 5th Assessment Report Summary, 2013.

Climate change has been identified as one of the most important challenges the global community faces, and it may also have potentially severe repercussions at the local level in Norfolk. Rising temperatures are already affecting the UK, with a 1°C increase in the average temperature compared with a century ago, with half of that increase occurring since 1970. It is virtually certain that these increases will continue and that it will accelerate with increases of 2°C to 5°C likely by the end of the 21st Century.

"It is virtually certain that there will be more frequent hot and fewer cold temperature extremes", IPCC 5th Assessment Report Summary, 2013. Winters are likely to be warmer; however, as a result of natural fluctuations within the climate, occasional winter extremes will continue to occur. The seasonal contrast in precipitation is likely to increase, winters are likely to be wetter, as average winter rainfalls will more likely than not increase 50% by the end of the century. Increased winter rainfall, combined with a likely increase in the quantity of rainfall from intense events in winter, will result in a greater risk of flooding.

Summers are virtually certain to be hotter, as summer average and average maximum temperature is likely to increase. Acute temperature events such as heat waves are very likely to increase. It is very likely that heat waves will be longer and occur more often, over the 21st century. Summers are also likely to be drier overall, although climate change will also lead to an increase in the number of heavy rainfall events. The warmer and drier summers will certainly have many implications including food production, health impacts, air quality and road infrastructural damage, and as a result of heavy rainfall events localised flash flooding, and increased crop damage.

Sea levels are already rising with a global average increase of 19 centimetres in just over a century, a rate that has not occurred during the previous two millennia. Mean sea levels are likely to rise by up to 0.82m in the 21st century, and are very likely to rise at rates faster than has been observed in the last 30 years (IPCC, 2013). Norfolk as a generally low lying area will be at increased danger of fluvial, tidal and surface water flooding in the future. Rising mean sea levels are likely to having a major impact on coastal erosion and coastal flooding.

Rising mean sea level is also the main cause of extreme sea level events (such as storm surge flooding) which are likely to have increased in global frequency since the 1970's. Higher wave and storm surge elevations are very likely, and increased frequency of winter storms, resulting in increased wind speeds, will have major impacts.

The UK Government is using a variety of policy measures with regard to climate change. The Climate Change Act 2008 sets out legally binding targets to reduce Green House Gas (GHG) emissions by at least 80%, based on 1990 levels, by 2050, and improve carbon management. The Carbon Plan 2011 sets out proposals for achieving emissions reductions in the first four carbon budgets.

The reduction of GHG is through the setting of Carbon budgets, the EU Emissions Trading Scheme and analysis and research to inform other elements of energy and climate change policy, such as those to reduce the demand for energy, reduce GHG emissions from sources including waste, transport and agriculture, increasing the contribution made by low-carbon technologies, including carbon capture and storage. In 2009, emissions from waste management represented just over 3% of UK GHG emissions, with methane from landfill responsible for 90% of this total. Between 1990 and 2009 methane emissions from landfill reduced by 70% principally as a result of the effects of landfill tax which reduced the amount of biodegradable waste sent to landfill, and the increased capture of landfill gas for energy generation. The Government has committed to working towards a zero waste economy, including the use of fuels such as biomass and wastes especially to generate

heat and electricity rather than reliance on fossil fuels. Waste prevention is the first step in the plan to reduce GHG emissions from waste.

5.3.3 Air Quality

Air Quality has important impacts on human health and the wider environment. The principal driver to manage and improve low air quality is the EU Ambient Air Quality Directive 2008. This directive sets legal limits for the major pollutants in ambient (outdoor) air which affect human health. These pollutants include nitrogen dioxide, and fine particulate matter, which as well as direct impacts can combine in the atmosphere to form ozone which as well as being a potent GHG can also have significant health impacts at low level.

The EU Ambient Air Quality Directive is transposed into national policy through assessment carried out by Defra on an annual basis to measure compliance with the EU limit values. National assessment identifies areas where the limit values are being exceeded or where air quality is low enough to give concern that an exceedance could occur.

District councils are required by the Local Air Quality Management regime to review and assess the air quality in their area to determine whether the national objectives are being met. If these objectives are not being met or there is a risk that they may not be met, then councils are required to define an Air Quality Management Area. In an AQMA the council is required to prepare a plan to improve the air quality - an Air Quality Action Plan.

Air quality, in particular high levels of nitrogen dioxide can have impacts on biodiversity and habitats through potential nutrient enrichment, therefore air quality is also an issue in relation to appropriate assessment through the Habitats Directive.

Transport is the largest source for most of the regulated pollutants; the Third Local Transport Plan for Norfolk will also tackle air pollution emissions from transport over the plan period. In addition, the statutory obligation to improve air quality in the three AQMAs designated in Norfolk will ensure that the number should decline through revocation. Implementation of the Act, however, will become increasingly difficult with increases in traffic growth and energy consumption, as the regulations are reactive and not preventative. The planned growth set out in district plans is projected to result in an increase in the number of miles driven in the county; new AQMAs cannot be ruled out.

5.3.4 Population

The Census is a ten yearly population survey and it was last undertaken in 2011. The key findings for Norfolk were that the increase in population across districts was uneven. The largest increase was in South Norfolk (13,300) followed by King's Lynn and West Norfolk (12,200) with very little growth in North Norfolk (3,100). This will result in dramatically different demands on services and housing across districts. Norfolk has a generally ageing population with a higher than average percentage of the population aged 45 or over, again there is an uneven distribution across the districts. North Norfolk has the third highest percentage of the population aged over 65 in the country (29%); this is mirrored by a small percentage of under 5s and under 19s. King's Lynn and West Norfolk also has a high percentage of the population in the 65-74 age group (12%). In Norwich the age structure is

radically different with a very high percentage in the 20-29 age group (29%), partly as a result of the student population at the University of East Anglia. This variation in age structure will result in differing requirements for services and the potential for different groups to be affected by the operation of minerals and waste facilities.

Accessibility is a high priority nationally as well as in district plans and a number of other plans including the Rural Development Strategy for Norfolk and the Third Local Transport Plan for Norfolk. Across Norfolk as a whole, between 2013 and 2026, the Local Planning Authorities plan to deliver 65,000 dwellings and around 60,000 jobs, which will go some way to tackling social exclusion. The Greater Norwich City Deal commits Broadland, Norwich and South Norfolk districts to deliver 13,000 more jobs than the Joint Core Strategy target and bring forward 3,000 more dwellings from the period after 2026. The scale of growth should reflect a location's ability to provide jobs, services and sustainable transport. Therefore growth in Norfolk, in terms of additional dwellings, is concentrated in and around urban areas, selected market towns and well-located villages with local services.

Additional transport infrastructure included in Norfolk's 3rd Local Transport Plan includes the Norwich Northern Distributor Road, Bus Rapid Transit for the Norwich area, Junction improvements at Postwick, Longwater and Thickthorn, Norwich city centre enhancements. A Third River Crossing is required at Great Yarmouth to enhance access to the port and remove freight traffic from the town centre. Improvements are also required to the A47.

The Norfolk Rural Development Strategy 2013-2020 contains priorities which work towards improving accessibility and social exclusion, including: increasing the quality and number of rural jobs, increasing the number of rural business start-ups, deliver superfast broadband, improve mobile phone coverage, increase attainment in rural schools, drive innovation, build on strengths in agri-tech, engineering and manufacturing sectors, and increase the rate at which new affordable housing is developed.

The New Anglia Local Economic Partnership Strategic Economic Plan commits the LEP to working with government and local partners to deliver 95,000 more jobs, 10,000 new businesses and 117,000 new homes by 2026 in the New Anglia area (Norfolk and Suffolk). This requires investment to improve the area's infrastructure and ensure that business has a supply of skilled workers.

Accessibility and social inclusion are expected to improve in the future from the implementation of these plans and strategies.

5.3.5 Historic Environment

The historic environment, particularly in Conservation Areas, is likely to continue to be preserved and restored through district council planning policies. Additionally, some heritage assets (such as Scheduled Monuments) are afforded additional statutory protection at the national level.

Norfolk also contains a large number of areas in which either undesignated heritage assets or archaeological assets occur. Archaeological assets may either be known or unknown where the potential of assets is high but no field studies have been carried out. The Historic Environment Record will be used when carrying out site assessments to ensure it is highlighted where undesignated heritage assets may occur. The NPPF, national guidance and the Minerals and Waste Core Strategy all indicate that prospective applicants will be expected to take designated and undesignated heritage assets into account through assessment and proposed mitigation.

Some planned housing and employment growth will most likely be sited on brownfield land, which will improve the townscape by regenerating derelict sites and may help to restore important historic buildings that are currently at risk. New green infrastructure proposals are likely to be largely beneficial for the historic environment. The overall effect on the historic environment and townscape over the plan period is likely to be neutral.

5.3.6 Biodiversity, flora, fauna and geodiversity

Loss of natural habitats due to the development of greenfield sites, water pollution and increased visitor pressure, all have the potential to adversely impact upon local biodiversity, particularly on vulnerable species. However, if existing agricultural sites are intensively farmed as a monoculture, their existing biodiversity value may already be low and the creation of green infrastructure as part of a new development may result in a biodiversity gain.

Norfolk's local plans contain policies specifically to protect and enhance biodiversity as part of the development of the county. For example, Policy 1 of the Greater Norwich Development Partnership's Joint Core Strategy states "development will minimise fragmentation of habitats and seek to conserve or enhance existing environmental assets..." Policy CP10 of the Breckland Core Strategy states that open spaces and areas of biodiversity interest will be protected from harm and the restoration, enhancement, expansion and linking of these areas to create ecological networks will be encouraged. Protection of species and habitats through the Norfolk Biodiversity Action Plan and the UK Biodiversity Action Plan will also help to mitigate potential negative effects of development.

The protection of internationally-designated sites through the Habitats Regulations will prevent or restrict development which could affect the most environmentally sensitive sites. For example, Policy 1 of the Greater Norwich Development Partnership's Joint Core Strategy states "All new development will ensure that there will be no adverse impacts on European and Ramsar designated sites and no adverse impacts on European protected species in the area and beyond including by storm water runoff, water abstraction, or sewage discharge. They will provide for sufficient and appropriate local green infrastructure to minimise visitor pressures." Policy SS1 of the Breckland Core Strategy states that "the Core Strategy will not allocate or promote any development within a 1,500 metre zone from the boundary of the areas of

Breckland SPA with Stone Curlew. Additionally, the Core Strategy will apply a 1,500m zone from that habitat which supports the Breckland SPA Stone Curlew population. In this second zone development will only be considered if the proposal is supported by a project level Habitats Regulation Assessment and suitable mitigation can be provided.”

Intensified development is likely to impact negatively on Norfolk's geodiversity. The integrity of coastal and fluvial landforms and the natural processes that maintain them is likely to be threatened by engineering work to reduce the impacts of rising sea levels and flooding. Finite landforms such as eskers, river terraces and floodplains and their associated sedimentary, palaeo-environmental and Palaeolithic archaeological archives are likely to be threatened by the rising demand for construction aggregate. Built and infrastructural development is likely to lead to a diffuse and increasing damage to natural landform throughout the county, although recording and sampling of excavated sections as part of mitigation measures will lead to increased information about geological strata. The Norfolk Geodiversity Action Plan, backed by a National Geodiversity Action Plan, will provide a context for raising public awareness of the importance of the county's Earth heritage, particularly as the number of County Geodiversity Site designations grow.

5.3.7 Landscape and Soil

In recent years, concern has grown about the gradual degradation of both the countryside and urban environment through changing farming practices, drainage of wetlands, increased pressure from transport and the need for new housing and other development. There has been loss of biodiversity and landscape as a result of development. Rural tranquillity is rapidly being eroded from growth and transport pressures. These pressures also lead to loss and fragmentation of habitats, which in turn impact negatively on local biodiversity. Norfolk contains designated landscapes such as the Norfolk Coast AONB, and the Norfolk Broads. It is important to note that these landscapes will also have areas surrounding them which will form part of their setting. The distance of this setting would be dependent on factors such as topography and the nature of the proposed development and its visibility in relation to the designated landscape.

Development has the potential to significantly affect the landscape, particularly if a significant proportion of this growth is built on greenfield sites, and appropriate mitigation strategies are not put in place. However, Local Planning Authorities in Norfolk have sought to put in place strategic policies to steer development into sustainable locations, and landscape quality plays a part in sustainable development. Development which is well matched to its surroundings in terms of scale and existing adjacent development can have minimal adverse impacts on landscape. The Local Planning Authorities have also put forward Development Management policies to improve and enhance Green Infrastructure through developer contributions or as conditions on specific applications. Green Infrastructure creation and improvement has positive benefits on both biodiversity and landscape.

Opportunities exist for sites of low landscape value, such as derelict land, to be redeveloped and this can result in a positive effect on landscape in the long term, especially if such sites incorporate Green Infrastructure creation

which may replace features lost many years before in the landscape. The loss of greenfield sites to development is more challenging in landscape terms, but a high quality masterplan design which integrates features such as green infrastructure can reduce any adverse landscape impacts. Often sites on the urban edges which are most sustainable for development are not of the highest landscape value as they have already been degraded by urban uses nearby. While greenfield land is finite and therefore losses are permanent and irreversible, this must be balanced against the need for sustainable growth for economic and social reasons, and the potential for mitigation to minimise adverse impacts. There is also the potential for restoration schemes for mineral extraction sites to create new high-quality landscapes and include green infrastructure.

The Local Planning Authorities in Norfolk have put in place through their respective Local Plans, policies which elaborate on the national policy contained in the NPPF that valued soils should be protected.

Where minerals or waste development is proposed on agricultural land, the Minerals and Waste Core Strategy states a clear preference for it to be located on land of lower agricultural grades 3b, 4 and 5. Mineral extraction is often proposed on lower grade land because it is the stone and sand content of the soils which make it valuable for mineral extraction that also decreases its agricultural quality.

Large scale development on agricultural land in the BMV grades over 20ha must be subject to consultation with Natural England. The Minerals and Waste Core Strategy also requires the operation and restoration of any mineral workings on the best and most versatile agricultural land to be carried out with high standards of soil management to enable restoration to a condition at least as good as its previous agricultural quality. DEFRA guidance is available on the correct handling of soils to ensure that they can be re-instated on restoration. A soil handling strategy is normally required as a condition of such permissions to minimise adverse impacts to high quality soils.

5.3.8 Human Health

Sustainable development underpins the National Planning Policy Framework, and includes making positive improvements in people's quality of life by 'replacing poor design with better design', 'improving the conditions in which people live, work, travel and take leisure', and 'widening the choice of high quality homes'. Minerals extraction and associated activities and waste management operations can play an important part in achieving these objectives. Silica sand is a nationally important mineral for the production of glass used in windows, and in the production of glass fibre, both of which can play a significant part in improving the thermal efficiency of housing. Norfolk contains a number of areas which are within the 20% most deprived in the country for indoor living environment (Figure 5-14) which is a measure of housing condition. Double glazing and improved internal and external insulation can improve housing condition indicators.

Chapter 8 of the National Planning Policy Framework sets out a number of ways in which the planning system can promote healthy communities, much of this is related to the planning of residential developments and associated facilities. However, there are a number of areas where minerals operations could have a positive impact, especially on restoration. In Paragraph 73 access to high quality open spaces and opportunities for sport and recreation are highlighted as making an important contribution to the health and well-being of communities. There have been examples in Norfolk of mineral operations facilitating open spaces and recreation areas, such as Whitlingham Country Park. Paragraph 75 of the NPPF states that 'Planning policies should protect and enhance public rights of way and access. Local authorities should seek opportunities to provide better facilities for users, for example by adding links to existing rights of way'. A number of mineral operations have provided such links on restoration.

Local Plans in Norfolk contain within them objectives and policies to encourage the development of healthy and active lifestyles, e.g. Greater Norwich Development Partnership Joint Core Strategy objective 11 and Policy 7. In terms of human health, obesity and other lifestyle-related health problems (such as diabetes and heart disease) are on the rise and may be further exacerbated by increases in sedentary lifestyles.

Traffic growth may lead to increases in congestion and have the ancillary effect of increasing the number of road traffic accidents and injuries, particularly affecting the most vulnerable in society. The Third Local Transport Plan for Norfolk contains targets to increase active modes of transport, reduce road traffic accidents and improve air quality, all of which will work to improve human health.

Article 13 of the EU Waste Framework Directive (2008/98/EC) requires the protection of human health, which is implemented in Part 6 of the Waste (England and Wales) Regulations 2011. National Planning Policy for Waste (2014) sets out in paragraphs 4, 5 and 7 and Appendix B how waste management authorities should identify suitable sites and areas for new or enhanced waste management facilities and the locational criteria to be considered. Testing the suitability of proposed sites in this way will ensure that waste is handled in a manner which protects human health. In addition, environmental permits which are required for many waste management facilities and regulated by the Environment Agency, ensure that ambient air and water quality meet standards that guard against impacts to the environment and human health.

The NPPF states that "when determining planning applications, local planning authorities should: ensure, in granting planning permission for mineral development, that there are no unacceptable adverse impacts on human health, and take into account the cumulative effect of multiple impacts from individual sites and/or from a number of sites in a locality". Therefore, in addition to local policies, there are also national policies and legislation in place to ensure that human health is not adversely affected by minerals extraction and waste management facilities.

5.3.9 Water and Flood Risk

The Water Framework Directive aims to deliver long-term protection of the water environment by improving the quality of all waters and requires all coastal and inland waters to reach “good” status by 2015. Negative impacts to the water system under this directive must be identified and a programme of measures established to address all types of impacts. The Environment Agency is subject to meeting targets for river catchment quality through the Water Framework Directive and associated targets should prevent further decline of water quality over the plan period.

Water Cycle Studies have informed the policies in the District Councils’ local plans, including identifying when additional waste water treatment capacity will be required for new housing developments. Linking the scale of growth with the provision of associated sewerage infrastructure will ensure that water quality is not detrimentally affected by new development.

All local plans are subject to a Strategic Flood Risk Assessment, development should be steered to areas with the lowest probability of flooding, and relevant planning applications also require a site specific Flood Risk Assessment, in accordance with the NPPF policies and NPPG. These measures are to ensure that new development can take place without unacceptable flood risk to the site itself and without increasing flood risk elsewhere.

However, the threat of flood risk is likely to significantly increase over the plan period, due to the effects of climate change.

It is possible for the restoration of mineral workings located in flood risk areas to be designed to increase flood water storage which could have a positive improvement on flood risk.

5.3.10 Material Assets

Both the existing population and planned growth have significant implications for minerals development. Additional minerals extraction will be required to support growth, through the supply of building materials for homes and associated infrastructure.

Planning for minerals extraction helps to ensure the provision of a steady and adequate supply of aggregates that reflect growth patterns. Without allocation of minerals sites, it is unlikely that the demand for minerals throughout the county would be met locally. An inadequate supply of minerals may lead to an increase in the price of aggregates, and/or industrial minerals and lead to imports of material from adjoining counties, with consequent increases in CO₂ emissions and additional HGV impacts. The adopted Minerals Site Specific Allocations Plan allocates sufficient mineral extraction sites over the plan period (to 2026) to meet the forecast need.

For silica sand the operations in Norfolk provide a significant proportion of the national demand for glass sand which ultimately meets a significant demand for window glass. The adopted Minerals SSA Plan includes one site for silica sand extraction with an estimated resource of 3 million tonnes of silica sand. There is currently a shortfall of 2.45 million tonnes of allocated silica sand resources in the Minerals SSA Plan and therefore the Silica Sand Review process will find additional specific sites, preferred areas and/or areas of search for silica sand extraction to meet this shortfall.

The existing population and planned growth will require suitable waste management facilities, to deal with both the waste generated by construction and demolition operations, and also waste produced by residents, businesses (including agriculture) and associated infrastructure such as schools and health care facilities. The adopted Minerals and Waste Core Strategy contains policies against which planning applications are currently determined and the Waste Site Specific Allocations Plan allocates sites for a range of waste management facilities.

Whilst the production of waste will continue to take place, where and how it is managed will be affected by the Minerals and Waste Core Strategy Review. The EU Waste Framework Directive requires that the management of waste should be moved up the waste hierarchy. Helping to achieve this objective is the responsibility of all waste producers, operators of waste management facilities and local planning authorities as well as waste planning authorities and waste disposal authorities.

5.3.11 Conclusion

The Norfolk Core Strategy and Minerals and Waste Development Management Policies DPD (the Core Strategy) was adopted in November 2011. The Core Strategy contains policies guiding future minerals extraction and associated development and waste management facilities in Norfolk up to the end of 2026.

In particular, the adopted Development Management policies in the Core Strategy cover the sustainability issues detailed in this scoping report, including:

- DM1 – nature conservation
- DM2 – core river valleys
- DM3 – groundwater and surface water
- DM4 – flood risk
- DM8 – design, local landscape and townscape character
- DM9 – archaeological sites
- DM10 – transport
- DM11 – sustainable construction and operations
- DM12 – amenity
- DM13 – air quality
- DM14 – progressive working, restoration and afteruse
- DM15 – cumulative impacts
- DM16 - soils

A review of the Core Strategy five years after adoption is included in the requirements for the Plan. The Core Strategy Review will assess the adopted policies following a review and update of the evidence base and determine whether changes to policies are required to ensure they remain up-to-date.

Following the Core Strategy Review, a review of the adopted Minerals Site Specific Allocations and Waste Site Specific Allocations Plans are planned to take place by 2018 (five years after adoption of these plans) to ensure they are consistent with any updated policies. The sites included in the adopted Site Specific Allocations Plans have been guided by their appropriateness against Core Strategy policies and other relevant planning policies.

The Silica Sand Review is intended to find suitable specific sites allocations, preferred areas and/or areas of search to address the identified shortfall in silica sand extraction sites to meet the demands of the silica sand processing plant in Norfolk only. It is intended that the selection of sites and areas for silica sand extraction will be based on the adopted Core Strategy policies, with criteria requiring additional location specific evidence to be provided to better inform the process of assessing proposed sites and areas.

6. Task A3: Sustainability Problems, Issues and Recommendations

6.1 Identification of Sustainability Problems

In the course of collecting sustainability baseline information, a number of problems and issues emerged which will clearly affect Norfolk and its sustainable development in the future. These are set out in the table below and include recommendations through which the Silica Sand Review and the Minerals and Waste Core Strategy Review can mitigate or reduce these sustainability problems and issues.

Table 11 – Sustainability problems, issues and recommendations

| SA/SEA Topic | Problems | Issues | Recommendation |
|--------------|--|---|---|
| Climate | <ul style="list-style-type: none"> ▪ Norfolk is predicted to have warmer, drier summers and wetter, warmer winters. Sea level is predicted to rise as a result of climate change. | <ul style="list-style-type: none"> ▪ Ensuring that minerals and waste facilities minimise greenhouse gas emissions as much as possible and contribute towards the mitigation of climate change ▪ Reduce landfilling biodegradable waste ▪ Reduce road transportation of minerals and waste where practicable ▪ Virtually all silica sand is transported out of Norfolk by rail. ▪ Encourage energy efficient buildings ▪ Encourage low carbon or renewable energy sources | <p>Proposed sites and areas for silica sand extraction which are most likely to minimise greenhouse gas emissions and mitigate climate change should be favoured in the Silica Sand Review.</p> <p>The impact of Minerals and Waste Core Strategy policies on greenhouse gas emissions and climate change mitigation and adaption must be considered in the Core Strategy Review process.</p> |

| SA/SEA Topic | Problems | Issues | Recommendation |
|--------------|---|---|---|
| Air | <ul style="list-style-type: none"> ▪ Air Quality Management Areas designated in King's Lynn and Norwich due to traffic congestion. | <ul style="list-style-type: none"> ▪ Minimising air pollution emissions from minerals and waste operations and transportation ▪ Ensuring that no new Air Quality Management Areas are declared as a result of development ▪ The majority of silica sand is transported out of Norfolk by rail. | <p>Proposed sites and areas for silica sand extraction which are most likely to minimise air pollution emissions, avoid the risk of breaching air quality thresholds, and avoid AQMAs should be favoured in the Silica Sand Review.</p> <p>The impact of Minerals and Waste Core Strategy policies on transport, the highway network and air quality must be considered in the Core Strategy Review process, including any potential for waterborne transportation.</p> |
| Population | <ul style="list-style-type: none"> ▪ Deprivation is higher in the urban areas of Norwich, Great Yarmouth, King's Lynn and Thetford. ▪ The potential for minerals and waste development to impact on local amenity, including cumulative impacts ▪ Increasing population requiring additional housing and associated facilities | <ul style="list-style-type: none"> ▪ Ensuring that minerals and waste developments do not adversely affect the amenity of local communities, through their location and operations, including air quality, noise, vibration, odour and transport impacts ▪ Take account of cumulative impacts | <p>The amenity impacts of proposed minerals sites and areas must be considered in the Silica Sand Review process.</p> <p>The amenity impacts of minerals and waste policy implementation must be considered in the Core Strategy Review process.</p> |

| SA/SEA Topic | Problems | Issues | Recommendation |
|--------------------------------------|--|--|--|
| Historic Environment | <ul style="list-style-type: none"> ▪ The potential for minerals and waste development to affect heritage assets and their settings | <ul style="list-style-type: none"> ▪ Protecting and enhancing both designated and undesignated heritage assets through appropriate location and design of minerals and waste developments ▪ Recognise that areas may contain unknown archaeological assets which may be adversely affected without investigation and appropriate mitigation. ▪ Provide enhancement of the setting of heritage assets through restoration schemes ▪ Opportunities arising through development to understand heritage assets and archaeology | <p>The impact of extraction on the historic environment must be considered in determining the acceptability of proposed sites and areas in the Silica Sand Review.</p> <p>This includes assessment and investigation in areas with a potential to contain unknown archaeological assets. However, extraction can enable the investigation of heritage assets and archaeological finds.</p> <p>The investigation of heritage and archaeological assets may provide an important resource for scientific study and education.</p> <p>The impact of Minerals and Waste Core Strategy policies on the historic environment must be considered in the Core Strategy Review process.</p> |
| Biodiversity, flora and fauna | <ul style="list-style-type: none"> ▪ Land take for development ▪ Water pollution affecting nature conservation designations ▪ Loss of finite geodiversity resources | <ul style="list-style-type: none"> ▪ The protection of habitats, species and geodiversity features as part of minerals and waste development planning ▪ Providing enhancement of biodiversity, habitats and geodiversity features as part of minerals and waste development, including through the enabling of scientific study and a part of restoration schemes | <p>The impact of extraction on designated sites and BAP habitats and species must be considered in determining the acceptability of proposed sites and areas in the Silica Sand Review.</p> <p>Opportunities for enhancement of biodiversity, habitats, species and geodiversity through restoration schemes.</p> <p>The impact of Minerals and Waste Core Strategy policies on designated sites and BAP habitats and species must be considered in the Core Strategy Review process.</p> |

| SA/SEA Topic | Problems | Issues | Recommendation |
|---------------------|---|---|---|
| Landscape | <ul style="list-style-type: none"> ▪ Gradual loss of countryside, landscape and tranquillity to development ▪ The potential for minerals and waste development to impact on the Broads Authority Executive Area, the AONB and Heritage Coast as well as landscape character | <ul style="list-style-type: none"> ▪ Protecting and enhancing landscape through appropriate location and design of minerals and waste developments, including landscaping schemes ▪ Provide enhancement through restoration schemes | <p>The impact of proposed sites and areas for silica sand extraction on the landscape must be considered in determining the acceptability of the proposed sites and areas (taking into account opportunities for improvement on restoration).</p> <p>The impact of Minerals and Waste Core Strategy policies on the landscape must be considered in the Core Strategy Review process.</p> |
| Human Health | <ul style="list-style-type: none"> ▪ High levels of health deprivation in the urban areas of Norwich, King's Lynn and Great Yarmouth. ▪ Poor housing quality in parts of Norwich, North Norfolk, King's Lynn and West Norfolk and Breckland. | <ul style="list-style-type: none"> ▪ Ensuring that minerals and waste facilities do not exacerbate health deprivation ▪ Take into account cumulative impacts ▪ Provide enhancement to public open space, public rights of way and recreation through restoration ▪ Assessing any potential risks to human health from gas emissions from mineral extraction and waste management facilities, including from previous land uses. | <p>The impact of silica sand extraction proposals on human health and well-being must be considered in determining the acceptability of proposed sites and areas in the Silica Sand Review.</p> <p>The impact of Minerals and Waste Core Strategy policies on human health and well-being must be considered in the Core Strategy Review process.</p> <p>Ensuring appropriate mitigation through the use of protective measures to protect human health from any potential gas emissions.</p> |

| SA/SEA Topic | Problems | Issues | Recommendation |
|------------------------|---|--|--|
| Water, Soil | <ul style="list-style-type: none"> • Only a small percentage of the rivers in Norfolk have been classified as good status or better status by the Environment Agency • Significant proportion of the county is covered by Groundwater Protection Zones • Need to preserve Norfolk's best and most versatile (grades 1, 2, or 3a) agricultural land | <ul style="list-style-type: none"> • Ensuring that minerals and waste development do not negatively affect surface water quantity or quality • Ensuring that minerals and waste development do not negatively affect groundwater quantity or quality • Ensuring that development does not permanently reduce the proportion of high quality agricultural land | <p>The impact of silica sand extraction on groundwater, surface water and soil quality must be considered in determining the acceptability of proposed sites and areas in the Silica Sand Review.</p> <p>The impact of Minerals and Waste Core Strategy policies on groundwater, surface water and soil quality must be considered in the Core Strategy Review process.</p> |
| Material Assets | <ul style="list-style-type: none"> • Declining production of aggregate minerals | <ul style="list-style-type: none"> ▪ Safeguarding mineral resources, extraction sites and infrastructure from being sterilised or prejudiced by non-mineral development ▪ Safeguarding existing significant waste management facilities from being prejudiced by non-waste development ▪ Variable production of recycled and secondary aggregates • Declining production of sand and gravel since 2007 • Increasing production of silica sand • Crushed rock for road building is mainly imported to Norfolk through one railhead in Norwich | <p>Assess the effectiveness of the adopted policy on minerals safeguarding as part of the Minerals and Waste Core Strategy Review</p> <p>The purpose of the Silica Sand Review is to ensure that a steady and adequate supply of silica sand is planned for.</p> <p>The impact of the Minerals and Waste Core Strategy policies on planning for a steady and adequate supply of aggregate minerals should be assessed as part of the Core Strategy Review process.</p> |

| SA/SEA Topic | Problems | Issues | Recommendation |
|------------------------|--|---|--|
| Material Assets | <ul style="list-style-type: none"> • Need to continue to drive waste management up the waste hierarchy and especially reduce the quantity of waste disposed of to landfill. • Need to enable waste to be disposed of or, in the case of mixed municipal waste from households, recovered, in line with the proximity principle | <ul style="list-style-type: none"> • Need sufficient facilities to enable waste to be managed as high up the waste hierarchy as practicable and in accordance with the proximity principle | <p>The impact of the Minerals and Waste Core Strategy policies on driving waste management up the waste hierarchy and meeting the principles of self-sufficiency and proximity must be assessed as part of the Core Strategy Review process.</p> |

7 Task A4: Development of SA/SEA Framework

7.1 Developing Sustainability Objectives

The SEA Directive does not specifically require the use of objectives or indicators, but they are a recognised way in which environmental, social and economic effects can be described, analysed and compared. The sustainability objectives describe a statement of intention and the desired direction of change, whilst indicators will be used to measure the performance of the minerals and waste policies against the objectives and also to predict their effects on sustainability.

To fulfil the requirements of the SEA Directive, objectives should cover biodiversity, population, human health, fauna, flora, soil, water, air climatic factors, material assets, cultural heritage, landscape and interrelationships between them. A set of sustainability objectives and indicators were used in the Sustainability Appraisals of the adopted Minerals and Waste Core Strategy, Minerals Site Specific Allocations and Waste Site Specific Allocations Development Plan Documents. The objectives were developed taking into account the Norfolk Minerals and Waste Development Framework objectives (detailed in Table 12), objectives from other relevant plans, policies and programmes, and local environmental, social and economic issues identified as part of the baseline analysis. These objectives are also the starting point for the Silica Sand Review and the Minerals and Waste Core Strategy Review. Following the review of relevant plans, policies and programmes and the baseline conditions analysis, it is considered that the existing SA Objectives continue to be suitable for use in the Silica Sand Review and the Minerals and Waste Core Strategy Review.

| SEA Topic | Sustainability Appraisal Objective |
|--|---|
| Climate | SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change |
| Air | SA2: To improve air quality in line with the National Air Quality Standards |
| Population | SA3: To minimise noise, vibration and visual intrusion |
| Population | SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion |
| Cultural Heritage | SA5: To maintain and enhance the character of the townscape and historic environment |
| Biodiversity, flora and fauna | SA6: To protect and enhance Norfolk's biodiversity and geodiversity |
| Biodiversity, landscape, soil, population | SA7: To promote innovative solutions for the restoration and afteruse of minerals and waste sites |
| Landscape | SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape |
| Human Health | SA9: To contribute to improved health and amenity of local communities in Norfolk |
| Water, soil | SA10: To protect and enhance water and soil quality in Norfolk |
| Material Assets | SA11: To promote sustainable use of minerals and waste resources |
| Climate, Population, Human Health | SA12: To reduce the risk of current and future flooding at new and existing development |
| Population | SA13: To encourage employment opportunities and promote economic growth |

Table 12: Sustainability Appraisal Objectives

7.2 Scoring of SA objectives

A range of factors are included in the scoring of the SA objectives, and the general considerations are listed in the following tables. There are two tables of SA Objectives, one for the assessment of specific sites and areas of search in the Silica Sand Review and one for both the assessment of strategic alternatives in the Silica Sand Review and for the assessment of the Minerals and Waste Core Strategy Review.

Table 13 shown below, details the factors that will be taken into account in assessing proposed specific site allocations, preferred areas and areas of search for mineral extraction. This table will be used to assess the Silica Sand Review and was also used in the assessment of sites in the Minerals Site Specific Allocations DPD. (This is not an exhaustive list – individual sites may have individual elements to be taken into account).

By definition, minerals development is only a temporary use of land; all minerals planning permissions are time-limited. The Sustainability Appraisal assessments will therefore be divided into two: the operational stage (the development and operation of the site, which broadly covers the ‘short’ and ‘medium’ terms); and the restoration/post-restoration stage (which broadly covers the ‘long’ term).

Table 13: SA scoring factors for the assessment of minerals sites and areas

| SA Objective | Factors taken into account in scoring |
|---|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | <ul style="list-style-type: none"> ▪ Distance from the existing silica sand processing plant at Leziate as a general proxy for CO₂ emissions: <5km ++; 5-10km +; 10-15km 0; 15-20km -; >20km -- ▪ Would restoration include any areas of woodland which could act as a carbon sink? |
| SA2: To improve air quality in line with the National Air Quality Standards | <ul style="list-style-type: none"> ▪ Would working the site worsen air quality generally? Would it impact on any already-designated AQMA or potentially lead to the designation of a new AQMA? |
| SA3: To minimise noise, vibration and visual intrusion | <ul style="list-style-type: none"> ▪ Would the site be close enough to dwellings to impact adversely on the amenity of residents? |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | <ul style="list-style-type: none"> ▪ Would working the site have any impact on (social) accessibility and social exclusion? |

| SA Objective | Factors taken into account in scoring |
|--|---|
| SA5: To maintain and enhance the character of the townscape and historic environment | <ul style="list-style-type: none"> ▪ Would working the site impact on local townscapes? ▪ Would working the site impact adversely on any Conservation Areas/listed buildings/Historic Parks & Gardens? ▪ Would working the site impact on non-designated heritage assets? ▪ Would working the site impact adversely on any designated archaeological sites? ▪ Would working the site potentially impact on unknown archaeological sites? ▪ Would working the site potentially enable the discovery of new archaeological finds? |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <ul style="list-style-type: none"> ▪ Would working the site impact adversely on designated ecological or geological/geomorphological sites (through damage), or on species or habitats? ▪ Would working the site allow access to useful geological/geomorphological assets? ▪ Would appropriate restoration offer opportunities for ecological gains? |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | <ul style="list-style-type: none"> ▪ Would restoration deliver any landscape/ ecological/ geological/ recreation / green infrastructure benefits instead of just restoration back to agricultural land? |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | <ul style="list-style-type: none"> • Would working the site affect adversely the countryside and landscape, particularly designated landscape? • Would restoration offer opportunities to improve the quality of countryside and landscape? |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | <ul style="list-style-type: none"> • Would health and amenity (including impact on the amenity when walking on footpaths) of residents/ visitors be affected? • Would restoration offer any opportunities for 'gains' (e.g. new footpaths)? |
| SA10: To protect and enhance water and soil quality in Norfolk | <ul style="list-style-type: none"> ▪ Would surface water and/or groundwater quality be affected during the operational stage? ▪ Would previous land uses pose a risk to the water environment as a result of development on the site. ▪ Would soils of 'best and most versatile' soil quality (grades 1, 2 and 3a) be affected or lost? |
| SA11: To promote sustainable use of minerals resources | <ul style="list-style-type: none"> ▪ Distance from the processing plant at Leziate a proxy for efficient use of silica sand: <5km ++; 5-10km +; 10-15km 0; 15-20km -; >20km -- |

| SA Objective | Factors taken into account in scoring |
|---|---|
| SA12: To reduce the risk of current and future flooding at new and existing development | <ul style="list-style-type: none"> ▪ Would the site be affected by flooding itself (noting that the NPPG classifies sand and gravel extraction as 'water compatible' development) or result in increased flood flows elsewhere? ▪ Would restoration involving the creation of water bodies provide additional flood storage capacity? |
| SA13: To encourage employment opportunities and promote economic growth | <ul style="list-style-type: none"> ▪ Would working the site provide new employment opportunities? ▪ Would working the site help contribute to economic growth generally in Norfolk (e.g. by facilitating the development of new roads, houses etc)? |

Table 14 details the factors that will be taken into account in assessing policies in the Minerals and Waste Core Strategy Review and assessing strategic alternatives in the Silica Sand Review against each SA Objective.

Table 14: SA scoring factors for the assessment of Core Strategy and Development Management policies and the assessment of strategic alternatives in the Silica Sand Review

| SA Objective | Factors taken into account in scoring |
|--|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect emissions to air from transport? ▪ Would implementation of the policy encourage energy efficient buildings and the provision of energy from renewable or low carbon sources? |
| SA2: To improve air quality in line with the National Air Quality Standards | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect air quality generally? ▪ Would implementation of the policy affect any already-designated AQMA or potentially lead to the designation of a new AQMA? |
| SA3: To minimise noise, vibration and visual intrusion | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect the amenity of residents? |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect (social) accessibility and social exclusion? |
| SA5: To maintain and enhance the character of the townscape and historic environment | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect local townscapes? ▪ Would implementation of the policy affect any Conservation Areas/listed buildings/Historic Parks & Gardens? ▪ Would implementation of the policy affect any designated archaeological sites? ▪ Would implementation of the policy potentially enable the discovery of new archaeological finds? |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect designated ecological sites, or on species or habitats? ▪ Would implementation of the policy enhance biodiversity (e.g. creation of new target habitat on site restoration)? ▪ Would implementation of the policy affect geological/ geomorphological sites? |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites [and waste management sites where applicable] | <ul style="list-style-type: none"> ▪ Would implementation of the policy deliver any landscape/ ecological/ geological/ recreation/ green infrastructure benefits on restoration instead of just restoration back to agricultural land? |

| SA Objective | Factors taken into account in scoring |
|--|---|
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | <ul style="list-style-type: none"> • Would implementation of the policy affect the countryside and landscape, particularly designated landscape? • Would implementation of the policy improve the quality of countryside and landscape? |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | <ul style="list-style-type: none"> • Would health and amenity (including impact on the amenity when walking on footpaths) of residents/ visitors be affected by implementation of the policy? • Would implementation of the policy lead to opportunities for 'gains' (e.g. new footpaths or public open space on site restoration)? |
| SA10: To protect and enhance water and soil quality in Norfolk | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect surface water and/or groundwater quality? ▪ Would implementation of the policy affect soils of 'best and most versatile' agricultural land (grades 1, 2 and 3a)? |
| SA11: To promote sustainable use of minerals and waste resources | <ul style="list-style-type: none"> ▪ Would implementation of the policy ensure that waste is managed as high up the waste hierarchy as practicable? ▪ Would implementation of the policy be in accordance with the proximity principle for waste? ▪ Would implementation of the policy affect the safeguarding of known mineral resources, mineral extraction sites and associated infrastructure? ▪ Would implementation of the policy affect the use of secondary and recycled aggregates? ▪ Would implementation of the policy provide a steady and adequate supply of aggregates and silica sand? ▪ Would implementation of the policy affect the highway network and road users? |
| SA12: To reduce the risk of current and future flooding at new and existing development | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect flood risk at minerals or waste management sites, or affect flood risk elsewhere? ▪ Would implementation of the policy lead to the creation of additional flood storage capacity? |
| SA13: To encourage employment opportunities and promote economic growth | <ul style="list-style-type: none"> ▪ Would implementation of the policy provide new employment opportunities? ▪ Would implementation of the policy contribute to economic growth generally in Norfolk (e.g. by facilitating the development of new roads, houses etc)? |

In the Silica Sand Review each proposed specific site, preferred area and area of search will be assessed against each SA/SEA Objective to determine

where they are likely to have a positive, neutral or negative effect. Proposed policies in the Minerals and Waste Core Strategy Review will also be assessed against each SA/SEA Objective to determine where they are likely to have a positive, neutral or negative effect. The proposed sites, areas and policies will be assessed according to short term, medium term and long term effects on the SA/SEA Objectives and will be scored against each SA Objective as follows:

| | |
|-----|-------------------------------|
| ++ | Significant positive effect |
| + | Positive effect |
| - | Negative effect |
| -- | Significant negative effect |
| 0 | No effect |
| +/- | Positive and negative effects |
| ? | Uncertain effect |

As well as primary sustainability effects, the assessment will also take into account secondary, tertiary, cumulative and synergistic effects in other areas.

8. Glossary

Air Quality Management Areas: Areas designated by local authorities because they are not likely to achieve national air quality objectives by the relevant deadlines.

Ancient woodland: An area of woodland which has had a continuous history of tree cover since at least 1600.

Area of Outstanding Natural Beauty (AONB): designated under the National Parks and Access to the Countryside Act 1949 for the purposes of preserving and enhancing their natural beauty.

Area of Search: areas where knowledge of mineral resources may be less certain but within which planning permission may be granted, particularly if there is a potential shortfall in supply. If it is not possible to designate Specific Sites, or Preferred Areas, the alternative way to plan for the steady and adequate supply of minerals is to designate Areas of Search.

Biodiversity: The variety of all life on earth (mammals, birds, fish, invertebrates, plants etc)

Conservation Area: An area designated by the Local Planning Authority under the Planning (Listed Buildings and Conservation Areas) Act 1990 as possessing special architectural or historical interest.

Core Strategy (for Minerals and Waste): This planning policy document contains the vision, objectives and strategic planning policies for minerals and waste development in Norfolk until 2026. The Minerals and Waste Core Strategy also includes Development Management policies which are used in the determination of planning applications to ensure that minerals extraction and associated development and waste management facilities can happen in a sustainable way.

Conservation Area: An area designated by the Local Planning Authority under the Planning (Listed Buildings and Conservation Areas) Act 1990 as possessing special architectural or historical interest.

County Wildlife Site: A site of local importance for wildlife. Outside SSSIs, County Wildlife Sites are the best sites for wildlife in Norfolk. Sites are designated using stringent criteria, by a committee composed of the Norfolk Wildlife Trust, Norfolk County Council, Natural England, the Norfolk Biological Records Centre, and the Norfolk Biodiversity partnership.

Cumulative Impact: The combined impacts of a number of developments on the environment, amenity, health, traffic etc.

Development Management: The process through which the Council determines whether a proposal for development should be granted planning permission, taking into account the development plan and any other material considerations.

Development Plan: This includes adopted Local Plans and neighbourhood plans and is defined in section 38 of the Planning and Compulsory Purchase Act 2004 (as amended) that set out the planning policies and proposals for the development and use of land. Decisions on planning applications must conform to the Development Plan, unless material considerations indicate otherwise.

Examination: The Local Plan will be subject to an independent examination by an independent planning inspector. The recommendations in the Inspectors report will inform the final adopted version, but are no longer legally-binding.

Geodiversity: The variety of rocks, minerals, fossils, soils and landforms, together with the natural processes which shape the landscape.

Groundwater: Water within soil, sediments or rocks below the ground surface. Water contained within underground strata is referred to as an aquifer.

Groundwater Source Protection Zone: The Environment Agency divides groundwater source catchments into four zones. These are based on the number of days taken by any pollutant to flow to the potable water abstraction borehole. Source protection Zone 1 is defined as a zone within which any contamination would reach the borehole within 50 days. This applies to groundwater at and below the watertable. This zone has a minimum 50 metre protection radius around the borehole. These zones are designed to provide control over activities taking place near boreholes which could result in contamination reaching the public water supply.

Habitats Regulations Assessment (Appropriate Assessment): *Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora* requires an Appropriate Assessment to be undertaken to assess the impacts of a land-use plan against the conservation objectives of a European Site and to ascertain whether it would adversely affect the integrity of that site.

Heritage asset: A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation.

Landbank: A stock of mineral reserves with planning permission for their extraction.

Listed building: A building or other structure officially designated as being of special architectural, historical or cultural significance using provisions under the Planning (Listed Buildings and Conservation Areas) Act 1990.. A listed building may not be demolished, extended or altered without special permission being granted by the Local Planning Authority. The Local Planning Authority must also consider if development nearby could cause adverse impacts to the listed building, and whether mitigation could address these impacts.

Local Development Scheme: Describes the Local Plan documents which the authority intends to prepare and the timetable for their preparation.

Local Planning Authority: An organisation with statutory planning powers, ie the relevant County, District, Borough or Unitary Council.

Local Plan: The plan for the future development of the local area, drawn up by the local planning authority in consultation with the community. In law this is described as the development plan documents adopted under the Planning and Compulsory Purchase Act 2004 (as amended). Current core strategies or other planning policies, which under the regulations would be considered to be development plan documents, form part of the Local Plan. The term includes old policies which have been saved under the 2004 Act.

Mineral Consultation Area: An area identified in order to ensure consultation between the relevant LPA and the Mineral Planning Authority

before certain non-mineral planning applications made within the area are determined

Mineral Safeguarding Area: An area designated by Minerals Planning Authorities which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development.

Mineral Planning Authority: An organisation with statutory planning powers relating to minerals development, in most areas the County or Unitary Council.

Mitigation: Measures to reduce, avoid or remedy any adverse impacts caused by development.

National Planning Policy Framework: This document sets out the Government's planning policies for England and was published on 27 March 2012. The NPPF must be taken into account in the preparation of Local and neighbourhood Plans, and is a material consideration in planning decisions. It states that in order to be considered sound a Local Plan should be consistent with national planning policy.

National Planning Practice Guidance: A web-based resource published by the Department for Communities and Local Government (DCLG) on 6 March 2014 and updated as needed. It is available at:
<http://planningguidance.planningportal.gov.uk/blog/guidance/>

Permitted reserves: Saleable minerals in the ground with planning permission for extraction. Usually expressed in million tonnes.

Planning conditions: Conditions attached to a planning permission for the purpose of regulating and controlling the development.

Preferred Areas: If it is not possible to designate Specific Sites, the next way to plan for a steady and adequate supply of minerals is to designate preferred areas, which are areas of known resources where planning permission might reasonably be anticipated. Such areas may also include essential operations associated with mineral extraction.

Principal Aquifers: These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Proximity principle: The EU Waste Framework Directive (2008/98/EC) requires Member States to "establish an integrated and adequate network of waste disposal installations and of installations for the recovery of mixed municipal waste collected from private households. The network shall enable waste to be disposed of or recovered in one of the nearest appropriate installations, by means of the most appropriate methods and technologies...". The requirement for waste to be disposed of or recovered in one of the nearest appropriate installations is called the proximity principle.

Ramsar sites: Wetlands of international importance, designated under the 1971 Ramsar Convention

Restoration: Operations designed to return an area to an acceptable environmental state, whether for the resumption of the former land use or for

a new use following mineral working. Involves the reinstatement of land by contouring, the spreading of soils or soil making materials etc.

Scheduled Monuments: Nationally important monuments and archaeological areas protected under the Ancient Monuments and Archaeological Areas Act

Secondary Aquifers: These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:

Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;

Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

Secondary Undifferentiated - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

Setting of a heritage asset: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

Site Specific Allocations: Also known as Specific Sites - where viable resources are known to exist, landowners are supportive of minerals development and the proposal is likely to be acceptable in planning terms. Such sites may also include essential operations associated with mineral extraction. This is the preferred way to plan for the steady and adequate supply of minerals as it provides the necessary certainty on when and where development may take place.

Site of Specific Scientific Interest (SSSI): Sites designated by Natural England under the Wildlife and Countryside Act 1981

Special Areas of Conservation (SAC): SSSIs given special protection under the European Union's Habitats Directive, which is transposed into UK law by the Habitats and Conservation of Species Regulations 2010.

Special Protection Areas (SPA): SSSIs which have been identified as being of international importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds found in European Union countries. They are European designated sites, classified under the EC Directive on the Conservation of Wild Birds.

Statement of Community Involvement: A document that sets out a local planning authority's intended consultation strategy for different elements of the planning process. This is a requirement of the Planning and Compulsory Purchase Act 2004.

Strategic Environmental Assessment: A procedure (set out in the Environmental Assessment of Plans and Programmes Regulations 2004) which requires the formal environmental assessment of certain plans and programmes which are likely to have significant effects on the environment.

Submission: A stage of the Local Plan preparation process where the plan is 'submitted' to the Secretary of State for independent examination by a planning inspector.

Sustainability Appraisal: An evaluation process for assessing the environmental, social, economic and other sustainability effects of plans and programmes. This is a statutory requirement.

Sustainable development: Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.

Norfolk Minerals and Waste Local Plan

Minerals Site Specific Allocations
Development Plan Document (DPD) –
Single Issue Silica Sand Review

Sustainability Appraisal Report – Part B



Norfolk Minerals and Waste Local Plan

Minerals Site Specific Allocations Development Plan Document (DPD) – Single Issue Silica Sand Review

Sustainability Appraisal Report - Part B

March 2016

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If you need this report in large print, audio, Braille, an alternative format or a different language please contact Norfolk County Council on 0344 800 8020 or 0344 8008011 (textphone) and we will do our best to help.

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Abbreviations

Acronyms and other abbreviations used in this report are listed below:

| | |
|-----------------------|--|
| AONB | Area of Outstanding Natural Beauty |
| AQMA | Air Quality Management Area |
| BGS | British Geological Survey |
| BMV | Best and Most Versatile (Agricultural Land Classification) |
| CO₂ | Carbon dioxide |
| CWS | County Wildlife Site |
| DPD | Development Plan Document |
| HRA | Habitats Regulations Assessment |
| LNR | Local Nature Reserve |
| MSSA | Minerals Site Specific Allocations |
| NCC | Norfolk County Council |
| NMWDF | Norfolk Minerals and Waste Development Framework |
| NNR | National Nature Reserve |
| NPPF | National Planning Policy Framework |
| NPPG | National Planning Practice Guidance |
| SA | Sustainability Appraisal |
| SAC | Special Area of Conservation |
| SEA | Strategic Environmental Assessment |
| SPA | Special Protection Area |
| SSSI | Site of Special Scientific Interest |
| SWMP | Surface Water Management Plan |

Non-Technical Summary

The principles of the planning system for England are set out in the Planning and Compulsory Purchase Act 2004 (as amended by the Localism Act 2010), the National Planning Policy Framework, National Planning Policy for Waste and the National Planning Practice Guidance.

The adopted Norfolk Minerals and Waste Development Framework (NMWDF) consists of the Core Strategy and Minerals and Waste Development Management Policies Development Plan Document (DPD), the Minerals Site Specific Allocations DPD and the Waste Site Specific Allocations DPD which together contain the policies for the development and use of land for minerals extraction and associated development and waste management facilities in Norfolk. These documents form the Local Plan for minerals and waste planning in Norfolk up to the end of 2026.

Under the Planning and Compulsory Purchase Act, there is a requirement for local planning authorities to undertake a Sustainability Appraisal (SA) on its Local Plan. Additionally, in June 2004, as assessment of the effects of certain plans and programmes on the environment, known as Strategic Environmental Assessment (SEA), became a requirement under European Directive 2001/42/EC. This Directive also applies to Local Plans.

In accordance with the Act, the Directive, and Government guidance, a combined SA/SEA was undertaken on the Development Plan Documents within Norfolk's adopted Minerals and Waste Development Framework.

There is a requirement within the NMWDF for a process of annual monitoring and a five yearly review of all the Development Plan Documents. There is also a requirement for a Silica Sand Single Issue Review of the Minerals Site Specific Allocations DPD to be undertaken. An SEA/SA will be undertaken of each review. The Scoping Report published in March 2015 was the first stage (Stage A) in this process.

The SA/SEA process follows the requirements of the SEA Directive and Regulations and the National Planning Practice Guidance. The SEA/SA Scoping Report built on the previous SEA/SA for the Minerals and Waste Site Specific Allocations and Minerals and Waste Core Strategy, to provide an up to date assessment for the Silica Sand Review and the review of the Minerals and Waste Core Strategy in 2016.

The Sustainability Appraisal Report has been published in two parts. Part A is the Scoping Report and Part B assesses the effects of alternative options for the Silica Sand Review.

The Scoping Report (Part A) provides an outline of the baseline information, key issues, relevant plans and programmes and SA/SEA framework and includes the following information:

- Statutory context;
- Influences of other plans and programmes;
- Sustainability baseline information;
- Issues for sustainable development; and
- Sustainability Appraisal Framework.

Policy, Plans and Programmes Review

A review of relevant European, national and local planning policy has been undertaken as part of the SA/SAEA process. The review highlights how the Silica Sand Review of the Minerals Site Specific Allocations DPD can contribute to delivering wider national and local objectives, whilst ensuring that key environmental protection objectives (such as the EU Wild Birds Directive and EU Habitats Directive) are respected.

Sustainability Baseline

The environmental, social and economic baseline for Norfolk was gathered in order to provide a base to predict future baseline evolution and assess the effects of the Silica Sand Review and the review of the Minerals and Waste Core Strategy. Baseline information collection was based on specific indicators included in the monitoring and implementation framework of the adopted Norfolk Minerals and Waste Plans. Analysis of trends and targets was used to help predict how the baseline might evolve without the implementation of the Silica Sand Review and the review of the Minerals and Waste Core Strategy.

Sustainability Problems and Opportunities

A number of problems and issues were identified from a review of the baseline information which could affect Norfolk and its sustainable development in the future. Key problems and issues of relevance to the Silica Sand Review included:

Climate change

- Norfolk is predicted to have warmer, drier, summers and wetter warmer winters. Sea level is predicted to rise.
- Carbon dioxide and methane emissions should be reduced from minerals extraction by reducing road transportation, encouraging energy efficient buildings and the provision of low carbon or renewable energy sources.

Air quality

- Air quality Management Areas are designated in King's Lynn due to traffic congestion.
- Minimise air pollution emissions from minerals extraction and associated transportation.

Population

- Need to ensure that minerals developments do not adversely affect the amenity of local communities, through their location and operations, including transport impacts and cumulative impacts.

Historic Environment

- Potential for minerals extraction to affect the setting of heritage assets.
- Need to protect and enhance heritage assets through appropriate location and design of minerals extraction and restoration schemes.

Biodiversity, flora and fauna

- Problems of land take for development, water pollution affecting nature conservation designations and the loss of finite geodiversity resources.
- Need to protect and enhance habitats, species and geodiversity features as part of minerals extraction planning, including through restoration schemes.

Landscape

- Gradual loss of countryside, landscape and tranquillity to development.
- The potential for minerals extraction to impact on the AONB and Heritage Coast as well as landscape character

- Need to protect and enhance the landscape through appropriate location and design of minerals extraction, including through restoration schemes.

Human health

- Need to ensure that minerals extraction does not exacerbate health deprivation and take into account cumulative impacts.
- Provide enhancement to public open space, public rights of way and recreation through restoration schemes.

Water, soil

- Only a small percentage of the rivers in Norfolk have been classified as good status or better status by the Environment Agency.
- Need to preserve Norfolk's best and most versatile (grades 1, 2, or 3a) agricultural land
- Need to ensure that minerals extraction does not negatively affect surface water quantity or quality or groundwater quantity or quality

Material Assets

- Increasing production of silica sand
- Need to safeguard mineral resources, extraction sites and infrastructure from being sterilised or prejudiced by non-mineral development

SA/SEA Framework

The SEA Directive does not specifically require the use of objectives or indicators, but they are a recognised way in which environmental, social and economic effects can be described, analysed and compared. Objectives and indicators were developed based on the development framework objectives; local planning and sustainability objectives, and review of the baseline and key issues for Norfolk.

The 13 sustainability objectives to be used in the assessment of the Silica Sand Review are:

1. To adapt to and mitigate the effects of climate change by reducing contributions to climate change
2. To improve air quality in line with the National Air Quality Standards
3. To minimise noise, vibration and visual intrusion
4. To improve accessibility to jobs, services and facilities and reduce social exclusion
5. To maintain and enhance the character of the townscape and historic environment
6. To protect and enhance Norfolk's biodiversity and geodiversity
7. To promote innovative solutions for the restoration and after-use of minerals and waste sites
8. To protect and enhance the quality and distinctiveness of the countryside and landscape
9. To contribute to improved health and amenity of local communities in Norfolk
10. To protect and enhance water and soil quality in Norfolk
11. To promote sustainable use of minerals and waste resources
12. To reduce the risk of current and future flooding at new and existing development
13. To encourage employment opportunities and promote economic growth

Factors, to be used in scoring each proposed site, area and policy against each SA Objective have been proposed for use in the Silica Sand Review and the Minerals and Waste Core Strategy Review.

Alternatives

Development of the Silica Sand Review has been through a number of stages, including an Initial Consultation, 'Call for Sites and Preferred Options. Following the publication of the Initial Consultation document in March 2015, the responses from the public consultation were assessed and a Call for Sites undertaken in June 2015. Sufficient suitable sites to meet the shortfall were not submitted. Therefore, as proposed in the Initial Consultation document, planning officers at Norfolk County Council have defined proposed Areas of Search for future silica sand extraction instead and these areas have been subject to Sustainability Appraisal. In deciding on the methodology used to define the areas of search, alternatives were considered regarding which land should be excluded from areas of search. The alternative options used to define the areas of search were consulted on in the Initial Consultation and have also been subject to Sustainability Appraisal.

The proposed specific site and the defined areas of search have been assessed by planning officers in consultation with relevant stakeholders and Norfolk County Council's relevant specialist officers (including landscape, ecology, highways and archaeology).

At the Preferred Options stage the initial assessments of the potential site and the Areas of Search were published for consultation. The initial assessments included a preliminary conclusion regarding the acceptability of the proposed Specific Site and Areas of Search for inclusion in the Silica Sand Review for future silica sand extraction.

The consultation responses from the Preferred Options stage were used to refine the conclusions on which sites/areas would be submitted to the Secretary of State as specific site allocations, or areas of search. The Pre-Submission version of the Silica Sand Review will be published for representations on soundness and legal compliance prior to its submission to the Secretary of State, for examination by an independent Planning Inspector. On adoption, the sites or areas of search included in the Silica Sand Review for future silica sand extraction will form part of the Minerals Site Specific Allocations DPD.

Consultation

In accordance with the SEA Directive, Norfolk County Council carried out a Scoping consultation on the Silica Sand Review, and the Minerals and Waste Core Strategy Review with statutory environmental bodies and other key stakeholders for a six week period in March and April 2015. Consultation comments have been addressed as much as possible in the subsequent stages of the SA/SEA and the development of the Silica Sand Review. The consultation comments received have been published, along with Norfolk County Council's planning officer responses, in the Initial Consultation Feedback Report in June 2015. The Feedback Report is available to view on Norfolk County Council's website at:

<http://www.norfolk.gov.uk/view/ncc166849>

The Initial Sustainability Appraisal Report Parts A and B accompanied the Preferred Options version of the Silica Sand Review for a six week period of consultation. The comments received in response to this consultation have been taken into account and addressed through the development of the Pre-Submission version of the Silica Sand Review, which will form part of the Mineral Site Specific Allocations DPD when adopted. The consultation comments received have been published, along with Norfolk County Council's planning officer responses, in the Preferred Options Feedback Report in January 2016. The Feedback Report is available to view on Norfolk County Council's website at: <http://www.norfolk.gov.uk/view/NCC169742>.

Silica Sand Review of the Minerals Site Specific Allocations Appraisal Developing Strategic Alternatives

In deciding on the methodology used to define the areas of search, alternatives were considered regarding which land should be excluded from areas of search. The alternative options used to define the areas of search were consulted on in the Initial Consultation and have also been subject to Sustainability Appraisal. The sustainability impacts have been assessed in a comparative way for the alternative options to dealing with each planning constraint. Therefore the first option for each constraint is assessed as a baseline and scored as neutral against each sustainability appraisal objective whilst the alternative option was assessed as either having the same effect, or a more positive or more negative effect than the first option for each of the sustainability appraisal objectives. This assessment helped to determine how the areas of search would be defined.

Likely significant environmental effects

The proposed specific site and all ten defined areas of search have been assessed against the 13 SA/SEA objectives to determine whether they would have positive, neutral or negative effects. During the extraction stages of working minerals sites, the main significant environmental effects that could occur within the areas of search are harm to the countryside and landscape, the historic environment and biodiversity. There are also potential climate change and air quality impacts from extraction locations that are at a greater distance from the existing processing plant at Leziate, due to increased HGV movements. The areas of search that scored the most negatively are AOS A, AOS B, and AOS C. Six areas of search are allocated in the Pre-Submission version of the Silica Sand Review (AOS A, AOS D, AOS E, AOS F, AOS I and AOS J) and one specific site (SIL 01) is allocated. It is considered that all potential adverse impacts from silica sand extraction within the specific site and allocated areas of search could be satisfactorily mitigated at the planning application stage.

Mitigation measures

In accordance with SA guidance, measures to prevent, reduce or offset significant adverse effects of implementing the Silica Sand Review of the Minerals Site Specific Allocations DPD have been considered based on the findings of the site and area of search appraisals. Typical mitigation measures recommended include requiring specific HGV routing, restoration to specified biodiversity habitats and the need for advanced screen-planting of trees. Appropriate location of mineral extraction sites is the most significant way that potential impacts can be mitigated.

Monitoring of significant effects

A draft monitoring regime has been established in order to monitor the effects implementation of the plan has on sustainability. To monitor effects on the 13 SA objectives, a total of 58 indicators will be monitored with the results published in the Monitoring Report.

Difference the process has made

In the Initial Sustainability Appraisal in October 2015, likely SA impacts of the strategic options to be used to define the areas of search were assessed. The Initial Sustainability Appraisal helped to determine the methodology used to define the areas of search. After areas of search were defined, all of the potential areas of search and the proposed specific site were assessed against the 13 Sustainability Appraisal objectives. The Initial Sustainability Appraisal helped inform which of the areas of search and specific site were appropriate to be allocated, which required boundary amendments to reduce adverse effects and which were not appropriate to allocate for future silica sand extraction.

This Sustainability Appraisal has been updated to take into account the responses to the 2015 consultation and the amended area of search boundaries. This Sustainability Appraisal has helped inform the determination of which areas of search and specific site are suitable to allocate and which are not suitable to allocate for future silica sand extraction.

1. Introduction

1.1 Terms of Reference

Under the European Directive 2001/42/EC, on the assessment of the effects of certain plans and programmes on the environment (also known as the 'Strategic Environmental Assessment (SEA) Directive'), and the resulting Environmental Assessment of Plans and Programmes Regulations 2004, a SEA is required to ensure that the environmental effects of the Silica Sand review of the Minerals Site Specific Allocations DPD are considered.

Under the Planning and Compulsory Purchase Act and the Town and Country Planning (Local Planning) (England) Regulations 2012, there is also a requirement for local planning authorities to undertake a Sustainability Appraisal (SA) on their Local Plan. The Sustainability Appraisal Report consists of the Scoping Report, published in March 2015 and revised in October 2015 and this Sustainability Appraisal Report (Part B).

Information on the legislative required and approach are contained within Section 2 of the 'Sustainability Appraisal Report (Part A) Scoping' document.

1.2 Purpose of the Initial Sustainability Appraisal Report (Part B)

The 'Sustainability Appraisal (Part A) Scoping' meets the requirements of Stage A of an SEA as required by the SEA Directive. Part A presents information on:

- the review of policies, plans and programmes,
- baseline environmental, social and economic information and key issues for Norfolk,
- sets the context and objectives for the SEA/SA Framework

The 'Sustainability Appraisal Report (Part B)' meets the requirements of Stage B of an SEA "developing and refining alternatives and assessing effects" as required by the SEA Directive. Part B presents information on:

- Silica Sand Review strategic options;
- the results of the appraisal to predict the effects of the alternatives for future silica sand extraction;
- the evaluation of the effects and alternatives for future silica sand extraction;
- recommendations to mitigate adverse effects and maximise benefits;
- the proposed monitoring framework.

Together, Parts A and B form a Sustainability Appraisal Report to fulfil the requirements of the Environmental Report as required by Article 5 (1) of the SEA Directive. The SA Report on the Silica Sand Review is a key output of the appraisal process, presenting information on the effects of the Silica Sand Review.

Stage C of the SA/SEA process is "Preparing the Sustainability Appraisal Report", which is the current document.

Stage D of the SA/SEA process is "Consulting on the draft Plan and the draft Sustainability Appraisal Report". As stated in section 1.7 below, an Initial Sustainability Appraisal Report was published for consultation in November 2015,

alongside the Preferred Options Consultation of the Silica Sand Review. This current Sustainability Appraisal Report builds on the Initial Sustainability Appraisal.

Stage E of the SA/SEA Process is monitoring the implementation of the Plan and this stage has not been reached yet for the Silica Sand Review.

1.3 Links with wider studies

Habitats Regulations Assessment

Under the European Directive 92/43/EEC) on the Conservation of Natural Habitats and Wild Fauna and Flora (also known as the ‘Habitats Directive’) the resulting Conservation of Habitats and Species Regulations 2012, a Habitats Regulations Assessment (HRA) is required where a plan may give rise to significant effects on European designated sites, known as Natura 2000 sites.

Natura 2000 sites consist of Special Protection Areas (SPA), Special Areas of Conservation (SAC) and Ramsar sites, and also include potential SPA (pSPA) and candidate SAC (cSAC). Within there are a number of SPAs and SACs and therefore a HRA is required. A HRA Stage 1 ‘Test of Likely Significance’ was undertaken for the Preferred Options of the Silica Sand Review to determine whether there are likely to be any significant effects on Natura 2000 sites. The Stage 1 HRA assessed that there could be uncertain significant effects on The Wash and North Norfolk Coast SAC from silica sand extraction within AOS A and AOS B. The Stage 1 HRA assessed that there could be likely significant effects on The Wash SPA and The Wash Ramsar from silica sand extraction within AOS A and AOS B. Area of search AOS B is considered to not be suitable to allocate for silica sand extraction. Therefore, a Stage 2 ‘Appropriate Assessment’ has been undertaken on AOS A. The HRA process has been undertaken in parallel with the SEA/SA and the Silica Sand Review and the processes have informed each other.

1.4 Limitations of the Sustainability Appraisal Report (Part B)

Norfolk County Council relied on published data and information provided by others (as well as data obtained by NCC) in the production of this Sustainability Appraisal Report (Part B). The information presented in this report is the result of a desk based review and no formal requests for records have been made.

The baseline information collected in the Scoping Report (Part A) is the most up-to-date information currently available; however, it is possible that conditions described in the Scoping Report may change over time. It is likely that this dataset will be updated throughout the SEA/SA process and for post-adoption monitoring requirements as new information becomes available or other information presents itself.

1.5 Structure of the Sustainability Appraisal Report

Stage A of the SA/SEA Process “setting the context and objectives, establishing the baseline and deciding on the scope” is contained within the ‘Sustainability Appraisal Report - Part A Scoping’ document, which is published along with this document ‘Sustainability Appraisal Report - Part B’.

The SA Report (Part B) contains stage B of the SA/SEA process “developing and refining alternatives and assessing effects” and is set out as follows:

- Section 1 of this report provides an introduction, including background, purpose of the SA Report and SA/SEA limitations;
- Section 2 presents the SA/SEA objectives to be used to assess the Silica Sand Review and alternatives (SA/SEA Task A4);
- Section 3 presents the findings from the compatibility test between the Core Strategy objectives and the SA/SEA objectives (SA/SEA Task B1);
- Section 4 presents the details of the Silica Sand Review strategic options considered (SA/SEA Task B2);
- Section 5 presents the results of the appraisal to predict the effects of the propose site and defined areas of search for the Silica Sand Review (SA/SEA Task B3);
- Section 6 presents the evaluation of the effects of the proposed site and defined areas of search for the Silica Sand Review (SA/SEA Task B4);
- Section 7 presents the recommendations to mitigation adverse effects and maximise benefits of the Silica Sand Review (SA/SEA Task B5);
- Section 8 provides details of the proposed monitoring framework linked to specific indicators (SA/SEA Task B6).

Stage C of the SA/SEA process is “Preparing the Sustainability Appraisal Report”, which is the current document.

Stage D of the SA/SEA process is “Consulting on the draft Plan and the draft Sustainability Appraisal Report”. It includes appraising significant changes and decision –making and providing information. As stated in section 1.7 below, an Initial Sustainability Appraisal Report was published for consultation in November 2015, alongside the Preferred Options Consultation of the Silica Sand Review. This current Sustainability Appraisal Report builds on the Initial Sustainability Appraisal.

1.6 Scoping Report Consultation

In accordance with the SEA Directive, Norfolk County Council carried out a scoping consultation on the Norfolk Minerals and Waste Local Plan Sustainability Appraisal. In March 2015, the Sustainability Appraisal Scoping Report accompanied the Initial Consultation on the Silica Sand Review of the Minerals Site Specific Allocations DPD, for a six week period of consultation. The documents were sent out to the three statutory consultees (Historic England, Environment Agency, and Natural England) and to other stakeholders and the public. The relevant organisations and individuals were contacted by email or letter and the consultation documents were made available on Norfolk County Council’s website, at all Norfolk libraries, at County Hall and at each of the Local Planning Authorities in Norfolk.

The Scoping Report included the following information:

- Statutory context
- Review of other plans, policies and programmes
- Sustainability baseline information
- Issues for sustainable development
- Sustainability Appraisal framework

The 13 sustainability appraisal objectives were consulted on as part of the Scoping Report. Consultation comments have been addressed as much as possible through subsequent stages of the Silica Sand Review.

The main issues raised in response to the Scoping Report consultation were:

| Key Issues Raised | Norfolk County Council officer response |
|---|--|
| Task A1: relationship with other plans, policies and programmes | |
| <p>Additional documents that should be included in this section are:</p> <ul style="list-style-type: none"> * The Broads Plan 2011 * The Broadland Rivers Catchment Plan. * The Landscape Character Assessment for The Broads * The Landscape Sensitivity Study for The Broads * The recent consultations from Historic England * The Archaeology in the Broads Report * Environment Agency's 'Groundwater Protection: policy and practice (GP3)' * The Convention on the Protection of Archaeological Heritage of Europe (Granada Convention) * Planning (Listed Buildings and Conservation Areas) Act (1990) * Historic England- Conservation Principles, Policy and Guidance * Local Authority Local Lists (of non-designated heritage assets) * Neighbourhood Plans Cheshire East Local Plan * The House of Commons Select Committee for the Department for Business Innovation and Skills report on the Extractive Industry (Oct 2014) * The Government response to the BIS committee report on the Extractive Industry (February 2015) * The UK Mineral Extraction Industry (April 2015) - CBI Minerals Group (Draft) | <p>The review of plans, policies and strategies will be amended to include the documents listed.</p> |
| Task A1: Key messages in review of plans, policies and programmes | |
| <p>Page 46: The situation with regards to Fracking and the Broads is currently unclear. There was an announcement that suggests fracking under the Broads is not sensible. Secondary legislation will define 'other protected areas'. Perhaps this can be clarified in this section?</p> | <p>The national planning policy position on The Broads and fracking is included in the table of key messages from plans, policies and programmes on page 46. If the national policy approach or legislation changes then the Sustainability Appraisal will be updated.</p> |
| Task A2: Sustainability baseline summary | |
| <p>All reference to 'English Heritage' should be changed within the document to 'Historic England'.</p> | <p>Reference to 'English Heritage' in the Sustainability Appraisal will be changed to 'Historic England'.</p> |

| Key Issues Raised | Norfolk County Council officer response |
|---|--|
| <p>Natural England is satisfied that the Scoping Report for the Sustainability Appraisal (SA) has outlined the relevant baseline information with regard to the environment, particularly at this high level stage. The SA objectives are appropriate and cover the key sustainability issues in relation to biodiversity, geodiversity and soil in Norfolk.</p> <p>The Broads Authority suggested the following indicators for SA issues of particular relevance to the Broads.</p> <p>*Page 63. SA5. More relevant indicators could be:</p> <ul style="list-style-type: none"> - How many archaeological finds there are as a result of the minerals or waste developments - Heritage appraisals completed and findings acted upon - Permissions approved contrary to heritage expert advice - Restoration schemes that consider or enhance a heritage asset. - If archaeology is found, then interpretation as part of a restoration scheme. <p>* Page 63. SA6. Indicators could be schemes approved contrary to biodiversity or geodiversity expert advice. Also restoration schemes that benefit wildlife or aid interpretation of geodiversity.</p> <p>* Page 64. SA8 Indicators could be works near to or in protected landscapes, how these have been assessed and if permission is approved contrary to landscape expert advice.</p> <p>* Page 65. Additional indicator of permissions granted contrary to EA advice on water quality grounds.</p> <p>How does the SA Scoping Report address the issue of Peat? Peat is important in terms of Carbon sequestration, biodiversity and archaeology.</p> | <p>Noted</p> <p>Page 63 – SA5. We will investigate whether additional indicators can be recorded using the Historic Environment Record. We will not be including any of the indicators suggested on archaeology because finds are of variable significance and therefore not appropriate to record quantitatively. In addition, a lack of archaeology on site would not be a negative outcome for the site. We will not be including the suggested indicators regarding heritage assets because these issues would be considered in the consultation response from statutory consultees on the historic environment and inform whether or not they object to the proposed development. An additional indicator will be added as suggested, to monitor the number of planning permissions granted contrary to historic environment objections from statutory consultees.</p> <p>Page 63 – SA6. Additional indicators will be added as suggested.</p> <p>Page 64 - SA8. Additional indicators will be added as suggested, to monitor the number of planning permissions granted within or adjacent to the AONB, the Heritage Coast Area, the Broads Authority Executive Area, and Conservation Areas and to monitor the number of planning permissions granted contrary to landscape objections from statutory consultees.</p> <p>Page 65 – Additional indicator will be added on water quality as suggested.</p> <p>Peat has not been discussed in the SA Scoping Report because the NPPF states that planning permission should not be granted for peat extraction from new or extended sites.</p> |
| Task A2: Description of current sustainability baseline | |
| <p>Page 70 refers to the importance of Carbon Dioxide but on page 62 only methane is assessed in detail.</p> | <p>Page 70 and 62 – climate change. The SA will be amended to include additional information on carbon</p> |

| Key Issues Raised | Norfolk County Council officer response |
|---|--|
| <p>Page 73. 5.2.4. The Drainage Mills in the Broads are important. Also the entire area of the Broads is an area of Exceptional Waterlogged Archaeology as identified by Historic England.</p> <p>Sibelco UK said that there is a contradiction between part of section 5.2.6 regarding adverse impacts of mineral extraction in river valleys and part of section 5.2.8 on page 84 which refers to opportunities for mineral extraction to increase flood storages areas.</p> <p>The Environment Agency said that part 5.2.8 of the Scoping Report should note that the 'Hydrogeological risk assessment' (HRA) is not just to protect groundwater quality; it is also primarily to protect the groundwater levels in the area around the quarry.</p> <p>The report should also make clear that the implementation of an impermeable barrier needs to be assessed by the Environment Agency to determine how the barrier blocks groundwater flow, which can cause both ecological damage and derogation down gradient, and groundwater flooding up gradient.</p> <p>Historic England said that 'Cultural Heritage' should be amended to 'Historic Environment' because this encompasses all aspects of heritage such as the physical built heritage and the less tangible cultural heritage.</p> <p>Norfolk's non-designated heritage assets should also be explored and form part of the baseline information. Details of such assets are held on the Norfolk's Historic Environment Record (HER) and Local Lists compiled by Local Authorities. Non-designated assets make up an important and valued part of this and it is important they are acknowledged. Their protection is also required by the NPPF.</p> <p>This section should highlight the important contribution of the setting of heritage assets. There is also limited reference to known or unknown archaeological sites. Sites which have</p> | <p>dioxide emissions, using the 'DECC Local Authority carbon dioxide emissions estimates: 2005-2012' and the DECC 'UK greenhouse gas emissions national statistics 1990-2013'.</p> <p>Page 73 5.2.4. This section will be amended to include information regarding the historic environment of The Broads, as requested.</p> <p>The potential exists both for mineral workings to increase flood risk, if poorly designed working schemes are put in place which restrict flows onto the floodplain in high flow events, whilst equally, a well-designed restoration scheme can improve capacity. These circumstances exist in different time frames and are dependent on the quality of both the working and restoration scheme, so no contradiction exists.</p> <p>Section 5.2.8 of the Sustainability Appraisal will be expanded to include reference to groundwater levels as well groundwater quality.</p> <p>Section 5.2.8 of the Sustainability Appraisal will be amended, as requested, to provide further information on potential impacts of impermeable barriers on groundwater and the Environment Agency's assessment role.</p> <p>'Cultural Heritage' will be amended to 'Historic Environment' as requested.</p> <p>As requested, the Sustainability Appraisal will be amended to include Norfolk's non-designated heritage assets.</p> <p>The SA will also be amended to highlight the important contribution of the setting of heritage assets, as requested.</p> |

| Key Issues Raised | Norfolk County Council officer response |
|--|--|
| <p>or have the potential for unknown archaeology should be acknowledged and explored, again the HER may provide data for such information.</p> | <p>The SA will be amended to provide additional information on known and unknown archaeological sites, as requested.</p> |
| <p>Task A2: Evolution of the sustainability baseline</p> | |
| <p>Page 100, 5.3.7 - This section should refer to designated landscapes as well as the setting of designated landscape settings.</p> <p>Sibelco said that the final sentence of section 5.3.1 fails to note container glass sand (clear bottles and jars) which is an important end use of silica sand supplied from Norfolk.</p> <p>While there may be a preference to seek to locate mineral development on lower agricultural soil grades (3b, 4 and 5), for silica sand resources this will potentially further restrict developable areas.</p> <p>Table 11 (Cultural Heritage) - how can heritage assets be enhanced through restoration schemes, unless this could be to seek to provide access to available heritage assets? Routinely minerals development provides the funding necessary to fully investigate cultural heritage and archaeological finds, providing detailed insight in to historical environs.</p> | <p>Section 5.3.7 of the Sustainability Appraisal, regarding landscape, will be amended to also refer to designated landscapes and their settings.</p> <p>The final sentence of section 5.3.1 does not refer to container glass because this section refers to the effect on the sustainability baseline from planned growth allocated in Local Plans and therefore links the need for window glass to planned construction of housing.</p> <p>Section 5.3.7 – the paragraphs on agricultural land and mineral extraction on page 101 simply summarise the existing local and national policy. Preferred areas/areas of search for future silica sand extraction are now only planned to exclude agricultural land grades 1 and 2, which affect a significantly smaller area of the silica sand resource.</p> <p>Heritage – The reference to enhancement of heritage assets through restoration schemes was intended to refer to enhancing the setting. It is recognised that mineral working can enable the investigation of heritage assets and archaeological finds and Table 11 will be amended to make this more explicit.</p> |
| <p>Task A3: sustainability problems, issues and recommendations</p> | |
| <p>Broads Authority comments on Table 11:</p> <ul style="list-style-type: none"> * Air: is there merit in using the water for transport? Is avoiding AQMAs a recommendation? * Biodiversity: Is there scope in restoration benefitting biodiversity? * Landscape: Broads should be mentioned. Is there scope in exploring landscape buffers or landscaping to sites? * Cultural Heritage: talk about opportunities for understanding archaeology and geodiversity <p>The Environment Agency agrees with the sustainability issues and problems identified so</p> | <p>The sections on air, biodiversity, landscape and cultural heritage in Table 11 will be amended as suggested.</p> <p>The Sustainability Appraisal will be amended as requested to include the risks to human health from gas</p> |

| Key Issues Raised | Norfolk County Council officer response |
|--|--|
| <p>far. However, there is no mention of potential risks to human health from gas emissions from mineral extraction and waste management facilities.</p> <p>There is no consideration of previous land uses and risks to the water environment from previous land uses which may have caused pollution in the locations of proposed minerals or waste management facilities.</p> <p>Historic England agrees with the sustainability issues which have arisen with regard to the Historic Environment.</p> <p>We advise that the 'Cultural Heritage' topic is changed to 'Historic Environment' for consistency. There is also the potential for unknown archaeological sites to be unacceptably impacted or damaged. It should be noted, that each site should be judged on a case by case basis and impacts to the historic environment will not always be able to be mitigated against. In addition, there may be the opportunity to use discovered sites, in terms of archaeology, as an educational resource.</p> | <p>emissions.</p> <p>The Sustainability Appraisal will be amended as requested to include the consideration of previous, potentially contaminating, landuses which may have caused pollution. However, it is considered that mineral extraction is most likely to take place on land that has not previously been developed.</p> <p>The 'Cultural Heritage' topic will be amended to 'Historic Environment', as requested.</p> <p>The table will be amended to include the issues raised regarding archaeology.</p> |
| <p>Task A4: Development of SA/SEA Objectives</p> | |
| <p>Page 114 - Table 14 SA5 - the issue of new archaeological finds should be included here.</p> <p>SA1: does not mention reducing contributions or adaptation to climate change.</p> <p>SA4: Accessibility to or of what? It is not clear how, as worded, this objective relates to Minerals and Waste.</p> <p>SA5: need to make it implicit that cultural heritage includes archaeology.</p> <p>Reference to the 'Cultural Heritage' topic should be changed to the 'Historic Environment'.</p> | <p>Page 114 – Table 14 SA5 – an additional bullet point will be added as follows: “Would implementation of the policy potentially enable the discovery of new archaeological finds?”</p> <p>SA Objective 1 will be amended as follows: “SA1 - To adapt to and mitigate effects of climate change by reducing contributions to climate change.”</p> <p>SA Objective 4 will be amended to state “To improve accessibility to jobs, services and facilities and reduce social exclusion” to clarify this objective. Minerals and waste facilities create employment and restoration schemes may incorporate enhanced public access. Some waste management facilities are open for local residents to use.</p> <p>SA Objective 5 will be amended to refer to the historic environment instead of cultural heritage as this will more clearly include archaeology.</p> <p>Reference to the 'Cultural Heritage' topic will be amended to 'Historic</p> |

| Key Issues Raised | Norfolk County Council officer response |
|---|--|
| <p>Historic England recommends the inclusion of two additional factors for scoring policies against objective SA5: * Would working the site impact on non-designated heritage assets? * Would working the site potentially impact on unknown archaeological sites?</p> <p>The Environment Agency supports the objectives, in particular objectives SA10 and SA12.</p> <p>Previous land uses should be taken into account when scoring sites and a desk study and assessment of risks to the water environment from these potential contaminating uses should be carried out to inform the scoring process.</p> <p>Table 13: SA1 and SA11 - We cannot see the relevance of the scoring in relation to local settlements in terms of silica sand extraction and reducing greenhouse gas emissions.</p> <p>The Table at the top of page 116 shows the same scoring (+) for "Positive Effect" and "Positive and Negative Effects". Should the latter be (+-)?</p> | <p>Environment' as requested.</p> <p>The additional factors for scoring sites against Factors to be taken into account in scoring policies against objective SA5 will be amended as requested. These factors will be assessed through consultation with the Norfolk Historic Environment Service and Historic England.</p> <p>Noted</p> <p>The scoring factors for sites assessed against objective SA10 will be amended to include previous land uses and the risk to the water environment from previous land uses due to the development of the site, as requested.</p> <p>Agreed that for SA1 and SA11 the distance from settlements is not relevant in terms of silica sand extraction and reducing greenhouse gas emissions. The scoring will be amended to refer to the distance of silica sand extraction sites from the existing processing plant at Leziat. Agreed that the table at the top of page 116 will be corrected so that the positive and negative effects are shown by scoring +/-.</p> |

1.7 Initial Sustainability Appraisal Report Consultation

In November 2015, the Initial Sustainability Appraisal Report accompanied the Preferred Options Consultation on the Silica Sand Review of the Minerals Site Specific Allocations DPD, for a six week period of consultation. As before, the documents were sent out to the three statutory consultees (Historic England, Environment Agency, and Natural England) and to other stakeholders and the public. The relevant organisations and individuals were contacted by email or letter and the consultation documents were made available on Norfolk County Council's website, at all Norfolk libraries, at County Hall and at each of the Local Planning Authorities in Norfolk. The Initial SA Report was published in two parts. Part A contained the revised Scoping Report and Part B contained:

- the SA/SEA objectives to be used to assess the Silica Sand Review and alternatives;
- the details of the strategic options considered to define areas of search for silica sand extraction;
- prediction of the effects of the propose site and defined areas of search for the Silica Sand Review;

- evaluation of the effects of the proposed site and defined areas of search for the Silica Sand Review;
- recommendations to mitigation adverse effects and maximise benefits of the Silica Sand Review;
- proposed monitoring framework and indicators

The main issues raised in response to the Initial Sustainability Appraisal Report were:

- Kent County Council considered that the methodology used accords with the relevant planning regulatory framework, the NPPF and NPPG.
- Natural England agreed with the Sustainability Appraisal objectives and how they have been scored in the report.
- Historic England had no further comments to make on the Sustainability Appraisal Scoping Report.

1.8 Consideration of Marine Planning in the Silica Sand Review

The Marine Management Organisation is responsible for Marine Planning in England. The East Inshore and East Offshore Marine Plans were adopted in April 2014, and are the relevant marine plans for the area covered by the Silica Sand Review.

The East Marine Plans reach landwards to the mean high water mark with land-use planning reaching the mean low water mark, meaning a shared responsibility between the Marine Management Organisation (MMO) and planning authorities for land-use planning in this inter-tidal zone.

Local Authorities and the Marine Management Organisation are covered by the Duty to Cooperate under Section 112 of the Localism Act 2011. Additionally, Local Authorities have duties under the Marine and Coastal Act 2009. The MMO has been consulted during the plan making process for the Silica Sand Review.

Section 58(3) of the Marine and Coastal Act 2009 requires that a public authority must have regard to the appropriate marine policy documents in the exercise of any function capable of affecting the whole or any part of the UK marine area which is not an authorisation or enforcement decision. Land-use planning such as the Silica Sand Review would be a function covered by the requirements of Section 58(3).

The safeguarded mineral resources defined within the Norfolk Minerals and Waste Plan extends into the intertidal zone within which the Marine Plan also extends.

The East Marine Plans contain no specific policies regarding silica sand extraction. The East Marine Plans contain policies AGG1, AGG2 and AGG3 which address marine aggregate extraction. The East Marine Plans contain licensed mineral extraction areas and mineral exploration areas. The British Geological Survey has also mapped areas considered to have high potential to contain viable marine aggregate resources. None of these areas extend into the intertidal zone adjacent to the Mineral Safeguarding Area for silica sand defined within the Norfolk Minerals and Waste Plan.

The Initial Consultation stage of the Silica Sand Review consulted on a draft methodology for defining Areas of Search for silica sand extraction. As part of this methodology a buffer was suggested of 250m from the boundary of the Wash SPA.

This would have the effect of removing the intertidal zone from the area in which potential areas of search would be defined.

It was necessary to define Areas of Search for silica sand extraction following a 'call for sites' consultation which resulted in insufficient specific sites being submitted to meet the shortfall in allocated silica sand extraction sites. The Preferred Options consultation sought views on ten potential areas of search which had been defined using the sieve mapping methodology consulted on in the Initial consultation. None of the potential areas of search extended into areas within the intertidal zone or which were considered likely to affect the marine planning zone. Following the Preferred Options consultation, it was concluded that it was appropriate to remove several areas of search from the Pre-submission document and to make amendments to the boundaries for all the other remaining areas of search. These amendments have had the effect of moving the boundaries of the areas of search further from the marine planning zone. The Pre-submission document contains six areas of search and one specific site.

Norfolk County Council as the Mineral Planning Authority has had regard to the East Inshore and Offshore Marine Plans in the plan-making process for the Silica Sand Review and concludes that the Silica Sand Review will not affect the landuse or activities covered by the Marine Plans.

2 Scoring of SA Objectives

The following tables are also included in the 'Initial Sustainability Appraisal – Part A Scoping' as part of Task A4.

A range of factors are included in the scoring of the SA objectives, and the general considerations are listed in the following tables. There are two tables of SA Objectives, one for the assessment of specific sites and areas of search in the Silica Sand Review and one for the assessment of strategic alternatives in the Silica Sand Review.

Table 1 below details the factors that will be taken into account in assessing proposed specific site allocations and areas of search for silica sand extraction in the Silica Sand Review. (This is not an exhaustive list – individual sites or areas of search may have individual elements to be taken into account).

By definition, minerals development is only a temporary use of land; all minerals planning permissions are time-limited. The Sustainability Appraisal assessments will therefore be divided into two: the operational stage (the development and operation of the site, which broadly covers the 'short' and 'medium' terms); and the restoration/post-restoration stage (which broadly covers the 'long' term).

Table 1: SA scoring factors for the assessment of minerals sites and areas

| SA Objective | Factors taken into account in scoring |
|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | <ul style="list-style-type: none"> ▪ Distance from the existing silica sand processing plant at Leziate as a general proxy for CO₂ emissions: <5km ++; 5-10km +; 10-15km 0; 15-20km -; >20km -- ▪ Would restoration include any areas of woodland which could act as a carbon sink? |
| SA2: To improve air quality in line with the National Air Quality Standards | <ul style="list-style-type: none"> ▪ Would working the site worsen air quality generally? Would it impact on any already-designated AQMA or potentially lead to the designation of a new AQMA? |
| SA3: To minimise noise, vibration and visual intrusion | <ul style="list-style-type: none"> ▪ Would the site be close enough to dwellings to impact adversely on the amenity of residents? |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | <ul style="list-style-type: none"> ▪ Would working the site have any impact on (social) accessibility and social exclusion? |
| SA5: To maintain and enhance the character of the townscape and historic environment | <ul style="list-style-type: none"> ▪ Would working the site impact on local townscapes? ▪ Would working the site impact adversely on any Conservation Areas/listed buildings/Historic Parks & Gardens? ▪ Would working the site impact on non-designated heritage assets? ▪ Would working the site impact adversely on any designated archaeological sites? ▪ Would working the site potentially impact on unknown archaeological sites? ▪ Would working the site potentially enable the discovery of new archaeological finds? |

| SA Objective | Factors taken into account in scoring |
|--|--|
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <ul style="list-style-type: none"> ▪ Would working the site impact adversely on designated ecological or geological/geomorphological sites (through damage), or on species or habitats? ▪ Would working the site allow access to useful geological/geomorphological assets? ▪ Would appropriate restoration offer opportunities for ecological gains? |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | <ul style="list-style-type: none"> ▪ Would restoration deliver any landscape/ ecological/ geological/ recreation / green infrastructure benefits instead of just restoration back to agricultural land? |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | <ul style="list-style-type: none"> • Would working the site affect adversely the countryside and landscape, particularly designated landscape? • Would restoration offer opportunities to improve the quality of countryside and landscape? |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | <ul style="list-style-type: none"> • Would health and amenity (including impact on the amenity when walking on footpaths) of residents/ visitors be affected? • Would restoration offer any opportunities for 'gains' (e.g. new footpaths)? |
| SA10: To protect and enhance water and soil quality in Norfolk | <ul style="list-style-type: none"> ▪ Would surface water and/or groundwater quality be affected during the operational stage? ▪ Would soils of 'best and most versatile' soil quality (grades 1, 2 and 3a) be affected or lost? |
| SA11: To promote sustainable use of minerals resources | <ul style="list-style-type: none"> ▪ Distance from the processing plant at Leziate a proxy for efficient use of silica sand: <5km ++; 5-10km +; 10-15km 0; 15-20km -; >20km -- |
| SA12: To reduce the risk of current and future flooding at new and existing development | <ul style="list-style-type: none"> ▪ Would the site be affected by flooding itself (noting that the NPPG classifies sand and gravel extraction as 'water compatible' development) or result in increased flood flows elsewhere? ▪ Would restoration involving the creation of water bodies provide additional flood storage capacity? |
| SA13: To encourage employment opportunities and promote economic growth | <ul style="list-style-type: none"> ▪ Would working the site provide new employment opportunities? ▪ Would working the site help contribute to economic growth generally in Norfolk (e.g. by facilitating the development of new roads, houses etc)? |

Table 2 details the factors that will be taken into account in assessing strategic alternatives in the Silica Sand Review against each SA Objective.

Table 2: SA scoring factors for the assessment of strategic alternatives in the Silica Sand Review

| SA Objective | Factors taken into account in scoring |
|--|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect emissions to air from transport? ▪ Would implementation of the policy encourage energy efficient buildings and the provision of energy from renewable or low carbon sources? |
| SA2: To improve air quality in line with the National Air Quality Standards | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect air quality generally? ▪ Would implementation of the policy affect any already-designated AQMA or potentially lead to the designation of a new AQMA? |
| SA3: To minimise noise, vibration and visual intrusion | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect the amenity of residents? |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect (social) accessibility and social exclusion? |
| SA5: To maintain and enhance the character of the townscape and historic environment | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect local townscapes? ▪ Would implementation of the policy affect any Conservation Areas/listed buildings/Historic Parks & Gardens? ▪ Would implementation of the policy affect any designated archaeological sites? ▪ Would implementation of the policy potentially enable the discovery of new archaeological finds? |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect designated ecological sites, or on species or habitats? ▪ Would implementation of the policy enhance biodiversity (e.g. creation of new target habitat on site restoration)? ▪ Would implementation of the policy affect geological/ geomorphological sites? |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites [and waste management sites where applicable] | <ul style="list-style-type: none"> ▪ Would implementation of the policy deliver any landscape/ ecological/ geological/ recreation/ green infrastructure benefits on restoration instead of just restoration back to agricultural land? |

| SA Objective | Factors taken into account in scoring |
|--|---|
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | <ul style="list-style-type: none"> • Would implementation of the policy affect the countryside and landscape, particularly designated landscape? • Would implementation of the policy improve the quality of countryside and landscape? |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | <ul style="list-style-type: none"> • Would health and amenity (including impact on the amenity when walking on footpaths) of residents/ visitors be affected by implementation of the policy? • Would implementation of the policy lead to opportunities for 'gains' (e.g. new footpaths or public open space on site restoration)? |
| SA10: To protect and enhance water and soil quality in Norfolk | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect surface water and/or groundwater quality? ▪ Would implementation of the policy affect soils of 'best and most versatile' agricultural land (grades 1, 2 and 3a)? |
| SA11: To promote sustainable use of minerals and waste resources | <ul style="list-style-type: none"> ▪ Would implementation of the policy ensure that waste is managed as high up the waste hierarchy as practicable? ▪ Would implementation of the policy be in accordance with the proximity principle for waste? ▪ Would implementation of the policy affect the safeguarding of known mineral resources, mineral extraction sites and associated infrastructure? ▪ Would implementation of the policy affect the use of secondary and recycled aggregates? ▪ Would implementation of the policy provide a steady and adequate supply of aggregates and silica sand? ▪ Would implementation of the policy affect the highway network and road users? |
| SA12: To reduce the risk of current and future flooding at new and existing development | <ul style="list-style-type: none"> ▪ Would implementation of the policy affect flood risk at minerals or waste management sites, or affect flood risk elsewhere? ▪ Would implementation of the policy lead to the creation of additional flood storage capacity? |
| SA13: To encourage employment opportunities and promote economic growth | <ul style="list-style-type: none"> ▪ Would implementation of the policy provide new employment opportunities? ▪ Would implementation of the policy contribute to economic growth generally in Norfolk (e.g. by facilitating the development of new roads, houses etc)? |

In the Silica Sand Review each proposed specific site and area of search will be assessed against each SA/SEA Objective to determine where they are likely to have a positive, neutral or negative effect. The strategic alternatives in the Silica Sand Review will also be assessed against each SA/SEA Objective to determine where they are likely to have a positive, neutral or negative effect. The proposed strategic alternatives, specific sites and areas of search have been assessed according to short term, medium term and long term effects on the SA/SEA Objectives and will be scored against each SA Objective as follows:

| | |
|-----|-------------------------------|
| ++ | Significant positive effect |
| + | Positive effect |
| - | Negative effect |
| -- | Significant negative effect |
| 0 | No effect |
| +/- | Positive and negative effects |
| ? | Uncertain effect |

As well as primary sustainability effects, the assessment will also take into account secondary, tertiary, cumulative and synergistic effects in other areas.

3 Task B1: testing the Norfolk Minerals and Waste Local Plan Objectives against the SA/SEA Objectives

3.1 Compatibility of the Norfolk Minerals and Waste Local Plan and SA/SEA Objectives

During the process of finalising the sustainability objectives, a compatibility matrix was drawn up as part of the appraisal process and was used to test compatibility of the sustainability objectives against the Norfolk Minerals and Waste Local Plan objectives. The Sustainability Appraisal Objectives are contained in Section 2 of this document. The Norfolk Minerals and Waste Local Plan objectives, contained in the Minerals and Waste Core Strategy, which was adopted in October 2013 are as follows:

Objectives in the adopted Core Strategy

| | |
|---------------|--|
| LDF1 | Ensure steady and adequate provision of primary, and increasingly recycled and secondary, minerals to meet requirements |
| LDF2 | Increase the proportion of waste recycling, composting and energy recovery |
| LDF3 | Minimise the amount of waste sent to landfill |
| LDF4 | Ensure mineral working takes place as close as reasonably possible to where these resources are used, and that waste is treated as close as reasonably possible to where it is generated |
| LDF5 | Increase the use and availability of sustainable transport in accessing waste and minerals facilities |
| LDF6 | Minimise the adverse traffic impacts of material extraction and associated development and waste management facilities |
| LDF7 | Minimise the impact of mineral extraction and associated development and waste management facilities on the environment by promoting opportunities to enhance and protect biodiversity, landscape and geodiversity, water supply, the wider countryside, and cultural heritage |
| LDF8 | Minimise soil and water contamination and flood risk arising from minerals and waste activities |
| LDF9 | Reduce methane and carbon dioxide emissions from mineral extraction and associated development and waste management facilities |
| LDF 10 | Contribute to the Renewables Obligation and regional targets for renewable energy by increasing the proportion of energy recovery from waste |
| LDF 11 | Improve employment opportunities, particularly for those most in need |
| LDF 12 | Ensure that mineral extraction and associated development and waste management facilities and associated transportation do not lead to Air Quality Management Areas and that emissions are reduced |
| LDF 13 | Mitigate adverse impacts on amenity resulting from mineral extraction and associated development and waste management facilities |

| Sustainability Appraisal Objectives | | | | | | | | | | | | | |
|-------------------------------------|-----|----|-----|---|-----|---|---|-----|-----|-----|----|----|----|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
| 1 | +/- | - | - | 0 | - | + | + | -/+ | - | -/+ | + | 0 | 0 |
| 2 | + | + | 0/- | 0 | 0 | 0 | 0 | 0 | +/? | + | + | 0 | 0 |
| 3 | + | 0 | + | 0 | 0 | 0 | 0 | 0 | + | + | + | + | 0 |
| 4 | + | + | - | + | 0/- | 0 | 0 | ? | - | 0 | + | + | 0 |
| 5 | + | + | 0/+ | 0 | 0/+ | + | 0 | 0 | 0 | 0 | + | + | 0 |
| 6 | 0/+ | +0 | + | 0 | 0/+ | 0 | 0 | 0 | + | 0/+ | 0 | 0 | 0 |
| 7 | 0 | 0 | 0 | 0 | + | + | + | + | 0 | 0/+ | 0 | 0 | 0 |
| 8 | 0 | 0 | 0 | 0 | 0 | + | 0 | 0 | + | + | 0 | 0 | 0 |
| 9 | + | 0 | 0 | 0 | 0 | + | 0 | + | + | + | 0 | + | 0 |
| 10 | + | + | + | 0 | 0 | + | 0 | + | + | + | + | + | 0 |
| 11 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | + |
| 12 | + | + | 0 | 0 | + | + | 0 | 0 | + | + | 0 | 0 | 0 |
| 13 | 0 | 0 | 0 | + | 0 | 0 | 0 | 0 | + | 0 | 0 | 0 | + |

Key

+ = positive effect

- = negative effect

0 = no effect

+/- = positive and negative effect

? = uncertain effect

In general, there is a high level of compatibility between Minerals and Waste Local Plan and SA objectives in that most of the Core Strategy objectives, if met, will either have no effect, or a positive effect on meeting the SA objectives.

Core Strategy Objective 1, in particular, has a low level of compatibility. This is due to the fact that minerals extraction and waste management is likely to have negative impacts on sustainability due to its industrial nature. Core Strategy Objective 1, however, is not without positive impacts as primary extraction of minerals to ensure adequate provision can benefit biodiversity and landscape through innovative after-use and restoration opportunities that these sites provide. Recycling has positive impacts arising from more efficient use of resources.

There are also tensions between Core Strategy Objective 4 and several SA objectives. Ensuring mineral working takes places as close as reasonably possible to where it is used and that waste is treated as close as reasonable possible to where it is generated, is likely to locate these facilities closer to centres of population. This in turn may have negative impacts in terms of noise, visual intrusion, vibration, townscape, health and general amenity for local communities.

4. Task B2: Developing Strategic Options

4.1 Options development

The following strategic options were considered for defining areas of search:

- Should areas of search exclude land within 2km of Roydon Common and Dersingham Bog SAC, or should a different distance be used?
- Should areas of search exclude land within 250 metres of The Wash SPA, The Wash Ramsar and The Wash and North Norfolk Coast SAC, or should a different distance be used?
- Should areas of search exclude land within 250 metres of SSSIs or should a different distance be used?
- Should areas of search exclude land within 15 metres of ancient woodland or should a different distance from these sites be used?
- Should areas of search exclude land within 250 metres of designated heritage assets or should a different distance from these sites be used?
- Should areas of search exclude land within 5km of the Norfolk Coast Area of Outstanding Natural Beauty or only exclude land within the AONB?
- Should areas of search exclude land within 125 metres of sensitive receptors for amenity impacts, or should a different distance be used?
- Should areas of search exclude allocated sites and sites with planning permission for non-mineral uses that are located in or adjacent to the silica sand resource, or include this land?
- Should areas of search exclude agricultural land grades 1, 2 and 3 or only exclude land grades 1 and 2?
- Should areas of search exclude land in flood zones 2 and 3, or include this land?
- Should areas of search only include the silica sand resource within the Leziate beds or should the whole silica sand resource, as mapped by the BGS, be included?
- Should an area of search be at least 20 hectares in area, or should all areas of search be considered?

These strategic options were consulted on in the 'Initial Consultation' which took place for six weeks in March and April 2015. The subsequent tables compare the impacts against each sustainability appraisal objective for the two alternative options for dealing with each planning constraint when defining areas of search.

The sustainability impacts have been assessed in a comparative way for the alternative options to dealing with each planning constraint. Therefore the first option for each constraint is assessed as a baseline and scored as neutral against each sustainability appraisal objective and the alternative option is assessed in comparison to it. Therefore the alternative option will be assessed as either having the same effect, or a more positive or more negative effect than the first option for each of the sustainability appraisal objectives.

Should areas of search exclude land within 2km of Roydon Common and Dersingham Bog SAC, or should a different distance be used?

| SA Objective | Exclude land within 2km of Roydon Common and Dersingham Bog SAC (this is the baseline option) | Exclude land within the hydrological catchments of Roydon Common and Dersingham Bog SAC |
|---|---|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | - Due to the area of land involved, excluding land within the catchment of Roydon Common and Dersingham Bog could increase transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate because it would remove some potential areas closer to the processing plant. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected as potential transport routes do not pass through the AQMAs. There is the potential for an increase in transport distances between areas of search and the existing processing plant at Leziate because some potential areas within the catchment have been removed. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 No difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 No difference between the options is expected, excluding land based on hydrological catchments would not result in significant additional areas of the historic environment being included or excluded. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | + Excluding land based on hydrological catchment would reduce the risk of impacts from extraction on water dependent biodiversity features within the catchment. |
| SA7: To promote innovative solutions for the restoration and after | 0 | 0 No difference between the options is expected. |

| SA Objective | Exclude land within 2km of Roydon Common and Dersingham Bog SAC (this is the baseline option) | Exclude land within the hydrological catchments of Roydon Common and Dersingham Bog SAC |
|--|---|---|
| use of minerals sites | | |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 No difference between the options is expected. Excluding land based on hydrological catchments would not result in significant additional areas of high landscape value being included or excluded. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 There are no groundwater source protection zones within the silica sand resource. Surface water quality is not expected to be effected by these options. No difference between the options is expected. Excluding land based on hydrological catchments would not result in significant additional areas of higher quality agricultural land being included or excluded. |
| SA11: To promote sustainable use of minerals resources | 0 | - Excluding land within the hydrological catchment of Roydon Common and Dersingham Bog reduces the area of land available to be considered for an area of search because the catchment covers a greater area than a 2km buffer. This provides fewer options for future locations of silica sand extraction. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 No difference between the options is expected. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | - Excluding land within the hydrological catchment of Roydon Common and Dersingham Bog reduces the area of land available to be considered for an area of search closest to the existing processing plant. This provides fewer options for future locations of silica sand extraction. There is the potential for an increase in transport distances between areas of search and the existing processing plant at Leziate |

| | | |
|---------------------|---|--|
| SA Objective | Exclude land within 2km of Roydon Common and Dersingham Bog SAC (this is the baseline option) | Exclude land within the hydrological catchments of Roydon Common and Dersingham Bog SAC |
| | | because some potential areas within the catchment have been removed |
| Conclusion | <p>There are no differences between the options for the majority of the sustainability indicators. This is mainly due to the difference in land area between excluding land based on a 2km buffer or based on hydrological catchments around Roydon Common and Dersingham Bog SAC and the location of constraints in relation to these distances. There would be a positive effect on biodiversity by excluding land based on hydrological catchments because it would remove land where the potential to impact on water dependent features is higher.</p> <p>The potential negative effects are that removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction closest to the Leziate. This might result in greater transport distances to the processing plant. However, overall it is considered that excluding land based on hydrological catchments from an area of search is considered to be an acceptable approach due to the international importance of Roydon Common and Dersingham Bog.</p> | |

Should areas of search exclude land within 250 metres of The Wash SPA, The Wash Ramsar and The Wash and North Norfolk Coast SAC, or should a different distance be used?

| SA Objective | Exclude land within 250m of The Wash (this is the baseline option) | Exclude land within 500 metres of The Wash |
|---|--|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0 No difference between the options is expected. There would not be any difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. There would not be any difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 No difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 No difference between the options is expected because no historic assets would be excluded by using a 500 metre buffer from The Wash. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0/+ No difference between the options is expected regarding geodiversity. No difference between the options is expected regarding biodiversity. There are County Wildlife Sites both within 250m and 500m of The Wash. The main issue raised by Natural England regarding potential impacts on The Wash is disturbance to birds from noise and lighting. Normal practice is for silica sand extraction sites to not have artificial lighting as all processing takes place at Leziate. It would be possible to require this by a planning condition. Due to the scale and operation of silica sand extraction sites, it is considered that the noise from machinery used to dig the silica sand would cause no more disturbances |

| SA Objective | Exclude land within 250m of The Wash (this is the baseline option) | Exclude land within 500 metres of The Wash |
|--|--|---|
| | | <p>at 250 metres than 500 metres. It is also possible to control noise levels by a planning condition.</p> <p>There is the potential that mineral extraction within 250 or 500 metres of The Wash would affect functional habitat used by the designated bird species of The Wash for foraging. Excluding land within 500 metres of The Wash would be expected to reduce the area of functional habitat that could potentially be affected. However, either option may not exclude functional habitat for The Wash as bird species may forage further inland.</p> <p>Restoration options for silica sand extraction, for example to deliver ecological benefits, would not be affected by whether or not land within 500 metres of The Wash is excluded from an area of search.</p> |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | <p>0</p> <p>No difference between the options is expected. Restoration options for silica sand extraction sites would not be affected by the exclusion of land within 500 metres of The Wash.</p> |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | <p>0</p> <p>A very small area of land within both 250 metres and 500 metres of The Wash is also within the Norfolk Coast AONB. However the AONB will be excluded from the areas of search. Excluding land within 500 metres of The Wash reduces the area of land available to be considered for an area of search by 140 hectares. However, the area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts.</p> |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | <p>0</p> <p>No difference between the options is expected.</p> |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | <p>0</p> <p>There are no groundwater source protection zones within the silica sand resource. Water quality is not expected to be affected by these options.</p> <p>Land within 250 metres of The Wash is not graded within the Best and Most Versatile agricultural land. Small areas of land within</p> |

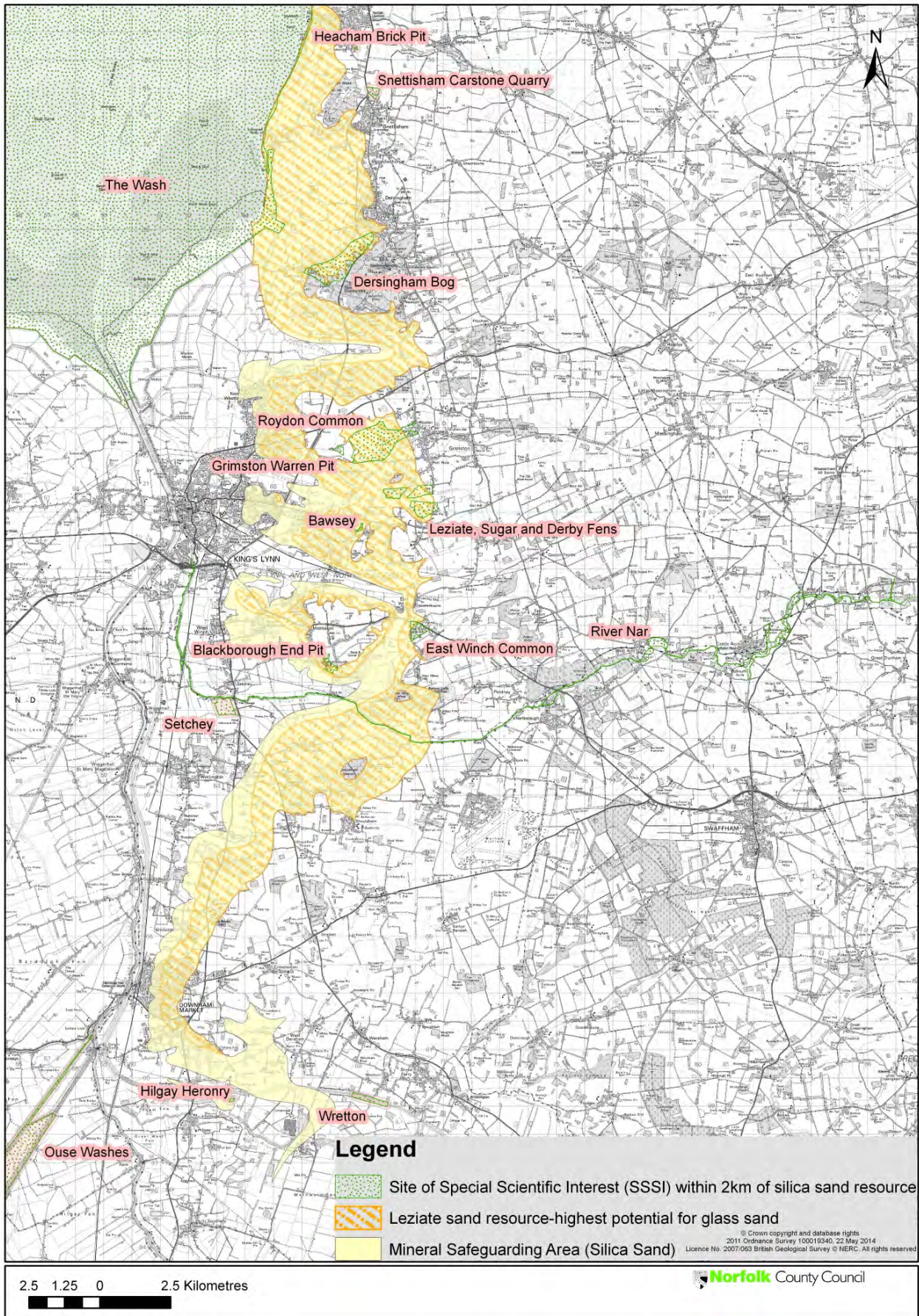
| SA Objective | Exclude land within 250m of The Wash (this is the baseline option) | Exclude land within 500 metres of The Wash |
|---|--|--|
| | | 500 metres of The Wash are within grade 3 agricultural land. However, these areas are not considered to be large enough for a benefit to soil quality to occur if land within 500 metres of The Wash is excluded. |
| SA11: To promote sustainable use of minerals resources | 0 | - Excluding land within 500 metres of The Wash reduces the area of land available to be considered for an area of search by around 140 hectares. This provides fewer options for future locations of silica sand extraction. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | + Land within both 250 metres and 500 metres of The Wash falls within flood zones 2 and 3. Excluding land within 500 metres of The Wash would exclude a larger area of land at flood risk from the areas of search for silica sand extraction. However, silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | -/0 Excluding land within 500 metres of The Wash reduces the area of land available to be considered for an area of search by around 140 hectares. This provides fewer options for future locations of silica sand extraction. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| Conclusion | <p>There are no differences between the options for the majority of the sustainability indicators. This is mainly due to the difference in land area between excluding land within 250 metres or 500 metres of The Wash and the location of constraints in relation to these distances from The Wash. It is considered that potential disturbance to birds from noise and light from silica sand extraction operations will be no greater at 250 metres than at 500 metres. Noise and light can also be controlled by planning conditions. There could potentially be a positive effect from excluding land within 500 metres of The Wash because this would be expected to reduce the area of functional habitat that could potentially be affected. However, either option may not exclude functional habitat for The Wash as bird species may forage further inland.</p> <p>The potential negative effect is that removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction. On balance, only excluding land within 250 metres of The Wash from an area of search is considered to be an acceptable approach because either option may not exclude functional habitat for The Wash. The impacts on functional habitat would be better assessed at the level of individual areas of search.</p> | |

Should areas of search exclude land within 250 metres of SSSIs or should a different distance be used?

| SA Objective | Exclude land within 250 metres of SSSIs (this is the baseline option) | Exclude land within 3km of biological SSSIs (based on Natural England's Impact Risk Zones) |
|---|---|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | - This option would remove such significant amounts of land that it would compromise the ability of the Plan to deliver sufficient glass sand to meet production demands. This in turn could impact on the ability of the UK glass industry to provide sufficient window glass to meet demands for more efficient glazing. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | - The only parts of the resource not excluded by this option would be at the southern extent of the resource. The existing AQMAs are within King's Lynn and would not be affected. If this option was brought forward; there would be significant potential increases in the transport distances between areas of search and the existing processing plant at Leziate compared only excluding land within 250 metres. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 The only parts of the resource not excluded by this option would be at the southern extent of the resource. However, no difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 The only parts of the resource not excluded by this option would be at the southern extent of the resource. However, no difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | - The only parts of the resource not excluded by this option would be at the southern extent of the resource. The majority of the areas left are of high landscape and/or historic value. Therefore this option would be likely to disproportionately impact on these designations. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | + The only parts of the resource not excluded by this option would be at the southern extent of the resource. No difference between the options is expected regarding geodiversity. As this option would exclude land within 3km |

| SA Objective | Exclude land within 250 metres of SSSIs (this is the baseline option) | Exclude land within 3km of biological SSSIs (based on Natural England's Impact Risk Zones) |
|--|---|---|
| | | of biological SSSIs, this would be expected to have positive impacts on biodiversity compared to only excluding land within 250 metres of SSSIs |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | - The only parts of the resource not excluded by this option would be at the southern extent of the resource. The southern extent contains the remnants of historic parkland and it is not considered that restoration in this area is likely to form any enhancement. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | - The only parts of the resource not excluded by this option would be at the southern extent of the resource. The majority of the areas left are of high landscape value. Therefore this option would be likely to disproportionately impact on the quality of the landscape. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 The only parts of the resource not excluded by this option would be at the southern extent of the resource. However, no difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | - There are no groundwater source protection zones within the silica sand resource. Water quality is not expected to be affected by these options. Excluding all parts of the resource apart from the southern extent would result in less non-agricultural and low grade agricultural land being included within potential areas of search. Therefore, the potential for impacts on Best and Most Versatile land is increased. |
| SA11: To promote sustainable use of minerals resources | 0 | -- This option significantly reduces the area of land available to be considered for an area of search. This provides such limited options for future locations of silica sand extraction that it could mean that the forecast silica sand needs cannot be met. There would also be an increased transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | + The land at the southern extent of the resource is mainly at low flood risk. Excluding all other land would exclude the land to the north of the resource which is at the highest |

| SA Objective | Exclude land within 250 metres of SSSIs (this is the baseline option) | Exclude land within 3km of biological SSSIs (based on Natural England's Impact Risk Zones) |
|---|--|---|
| | | risk of flooding. However, silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | -- This option would remove such significant amounts of land that it would compromise the ability of the Plan to deliver sufficient glass sand to meet production demands. This in turn could impact on the ability of the UK glass industry to provide sufficient window glass to meet demands. This could have downstream economic impacts in manufacturing, construction and transport jobs nationally. |
| Conclusion | Excluding land within 3km of SSSIs with biological features removes a significant area of the silica sand resource. The removal of this area poses major difficulties in being able to define sufficient areas of search to meet the shortfall. There are also potential negative effects on landscape, the historic environment, soil quality and transport impacts. There would be positive impacts on biodiversity by excluding land within 3km of SSSIs, however it is not considered necessary to exclude all land within 3km of SSSIs in order to avoid negative impacts on biodiversity. Due to the significant negative effects and the limited positive effects it is considered appropriate to only exclude land within 250 metres of biological SSSIs. The impacts on individual SSSIs would be better assessed at the level of individual areas of search. | |



Should areas of search exclude land within 15 metres of ancient woodland or should a different distance from these sites be used?

| SA Objective | Exclude land within 15 metres of ancient woodland (this is the baseline option) | Exclude land within 250 metres of ancient woodland |
|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0 No difference between the options is expected. There would not be any difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. There would not be any difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 No difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 Due to the small number and size of ancient woodland sites within the silica sand resource no difference between the options is expected on the historic environment. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0/+ No difference between the options is expected regarding geodiversity. Excluding land within 250 metres of an ancient woodland site is expected to have a positive impact on biodiversity because dust emissions from mineral extraction operations can be mitigated within this distance. Excluding land within 250 metres of ancient woodland sites also increases the protection to sites from changes to groundwater from mineral extraction, although it is recognised that a greater distance may be required between ancient woodland and mineral extraction sites, depending on the details of the extraction depth, groundwater level and method of operating. |

| SA Objective | Exclude land within 15 metres of ancient woodland (this is the baseline option) | Exclude land within 250 metres of ancient woodland |
|--|---|---|
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0 No difference between the options is expected. Restoration options for silica sand extraction sites would not be affected by the exclusion of land within 250 metres of ancient woodland. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 Three of the ancient woodland sites are within the Norfolk Coast AONB. However the AONB will be excluded from the areas of search. Excluding land within 250 metres of the remaining three ancient woodland sites slightly reduces the area of land available to be considered for an area of search. However, the area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 No difference between the options is expected for water quality or soil quality. |
| SA11: To promote sustainable use of minerals resources | 0 | -/0 Excluding land within 250 metres of ancient woodland sites reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. However due to the small number and size of ancient woodland sites within the silica sand resource, this would result in only a small difference in available land area. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 No difference between the options is expected. |
| SA13: To encourage employment opportunities and promote economic | 0 | - Excluding land within 250 metres of ancient woodland sites reduces the area of land available to be considered for an area of |

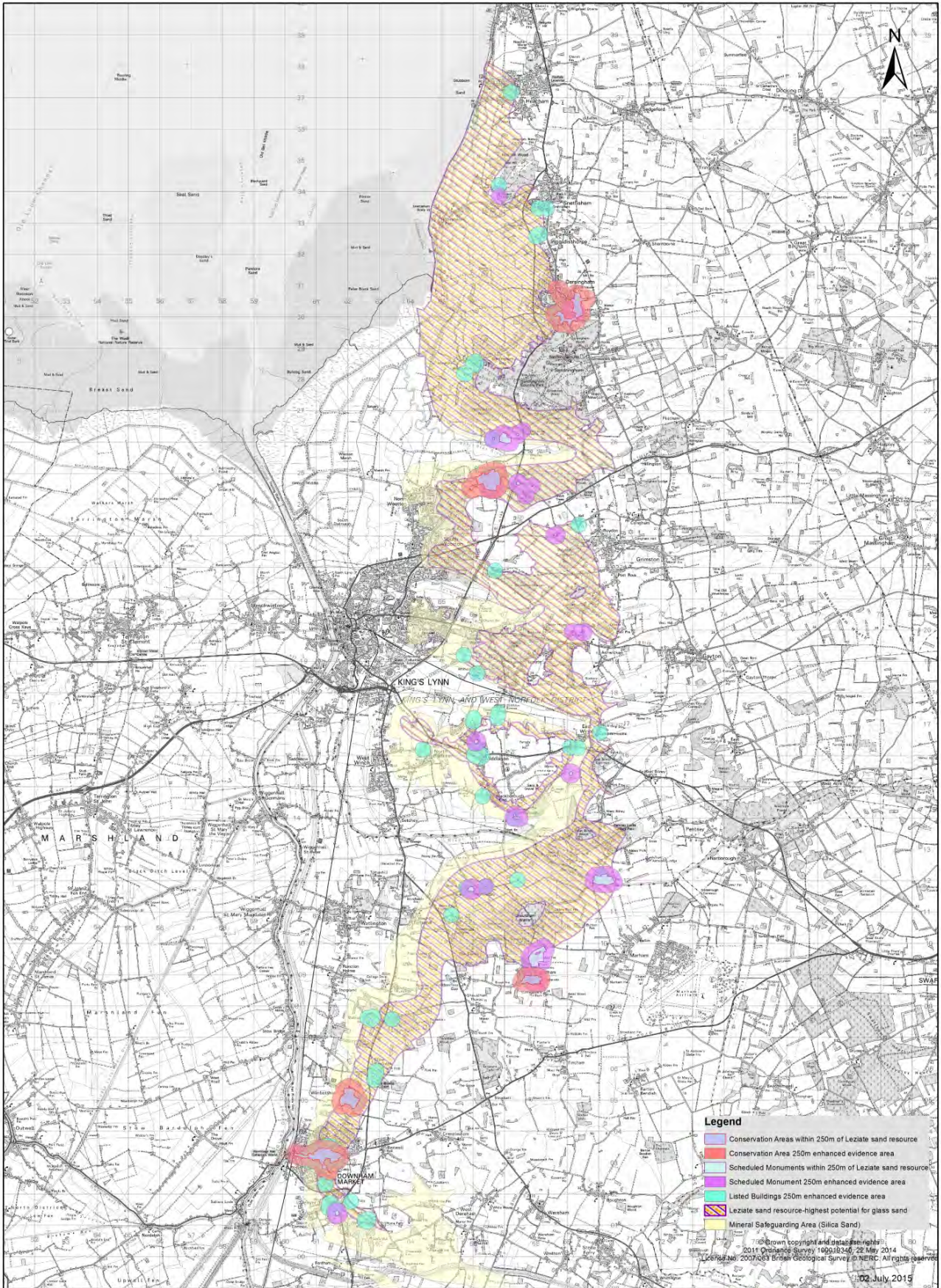
| | | |
|---------------------|---|--|
| SA Objective | Exclude land within 15 metres of ancient woodland (this is the baseline option) | Exclude land within 250 metres of ancient woodland |
| growth | | search. This provides fewer options for future locations of silica sand extraction. However due to the small number and size of ancient woodland sites within the silica sand resource, this would result in only a small difference in available land area. |
| Conclusion | <p>There are no differences between the options for the majority of sustainability indicators. This is mainly due to the small number and size of ancient woodland sites within the silica sand resource. Positive impacts on biodiversity would be expected by excluding land within 250 metres of ancient woodland sites from the areas of search. Negative impacts would be expected on the use of mineral resources and economic growth because excluding land within 250 metres of ancient woodland sites from consideration as an area of search reduces the options available for future locations of silica sand extraction. However, the amount of land that would be excluded is only a very small area of the silica sand resource. On balance it is considered that the positive biodiversity effects of excluding land within 250 metres of ancient woodland sites outweigh the affect this has on reducing the options available for areas of search.</p> | |

Should areas of search exclude land within 250 metres of designated heritage assets or should a different distance from these sites be used?

| SA Objective | Exclude land within 250 metres of heritage assets (this is the baseline option) | Exclude land within 1km of designated heritage assets |
|---|---|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | -- This option would remove such significant amounts of land that it would compromise the ability of the Plan to deliver sufficient glass sand to meet production demands. This in turn could impact on the ability of the UK glass industry to provide sufficient window glass to meet demands for more efficient glazing. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | -- The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. The existing AQMAs are within King's Lynn and would not be affected. If this option was brought forward; there would be significant potential increases in the transport distances between areas of search and the existing processing plant at Leziate compared with the 250m buffer. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. However, no difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected because mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | - The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. The majority of the areas left are of high landscape value or have the potential to contain undesignated heritage assets. Therefore this option would be likely to disproportionately impact on these. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | - The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. This would remove some areas containing national and European environmental designations. |

| SA Objective | Exclude land within 250 metres of heritage assets (this is the baseline option) | Exclude land within 1km of designated heritage assets |
|--|---|--|
| | | However, it would concentrate the search for potential extraction sites towards an area which has the potential to contain functional habitat for birds on The Wash. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | - The only parts of the resource not excluded by this option would be at the northern and southern extents of the resource. The potential exists for habitat creation in the northern area similar to the existing Snettisham reserve which is in old gravel workings. The southern extent contains the remnants of historic parkland and it is not considered that restoration in this area is likely to form any enhancement. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | - The northern extent of the resource forms an open landscape, and there are viewpoints from elevated positions on the boundary, extraction in this area would result in significant landscape change, although it is in a landscape which has historically been subject to a great deal of change. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | - There are no groundwater source protection zones within the silica sand resource. Excluding all parts of the resource apart from the northern and southern extents would result in less non-agricultural and low grade agricultural land being included within potential areas of search. Therefore, the potential for impacts on Best and Most Versatile land is increased. |
| SA11: To promote sustainable use of minerals resources | 0 | -- This option significantly reduces the area of land available to be considered for an area of search. This provides only limited options for future locations of silica sand extraction and could mean that the forecast silica sand needs cannot be met. There would also be an increased transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and | 0 | - The northern extent of the resource is in flood |

| SA Objective | Exclude land within 250 metres of heritage assets (this is the baseline option) | Exclude land within 1km of designated heritage assets |
|---|---|--|
| future flooding at new and existing development | | risk zones 2 and 3. Therefore if only the northern and southern extents of the resource are available, this increases the potential for mineral extraction to take place on land at higher flood risk. However, silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | - This option would remove such significant amounts of land that it would compromise the ability of the Plan to deliver sufficient glass sand to meet production demands. This in turn could impact on the ability of the UK glass industry to provide sufficient window glass to meet demands. This could have downstream economic impacts in manufacturing, construction and transport jobs nationally. |
| Conclusion | There are a large number of potential negative effects from the exclusion of land within 1km of designated heritage assets. This option would exclude such a large area of land from consideration for silica sand extraction that there could be negative impacts on minerals, the economy and transport. The few areas that would not be excluded are at higher flood risk, higher agricultural land quality, near to The Wash, of high landscape quality and potentially containing undesignated heritage assets. Therefore there would also be negative impacts on all of these sustainability objectives. The setting of a heritage asset is likely to be different for each heritage asset. Therefore, excluding land within 1km of every designated heritage asset is not an appropriate way to ensure no adverse impacts on heritage assets. Therefore, due to the significant number of negative impacts expected from excluding land within 1km of designated heritage assets it is considered to be appropriate to only exclude land within 250 metres of designated heritage assets. A full assessment of potential impacts on designated heritage assets would be more appropriately carried out at the level of individual areas of search. | |



2,500 1,250 0 2,500 Metres



Area of Search sieve mapping stage 2: Designated Heritage Assets

Norfolk County Council

Should areas of search exclude land within 5km of the Norfolk Coast Area of Outstanding Natural Beauty or only exclude land within the AONB?

| SA Objective | Exclude land within the Norfolk Coast AONB (this is the baseline option) | Exclude land within 5km of the Norfolk Coast AONB |
|---|--|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | - Excluding land within 5km of the Norfolk Coast AONB would lead to increased transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | - The existing AQMAs are within King's Lynn and would not be affected. However, excluding land within 5km of the Norfolk Coast AONB would lead to increased transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0/+ No difference between the options is expected with regards to noise and vibration. Excluding land within 5km of the AONB is expected to have a positive effect on visual intrusion within the 5km area. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected because mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 There are heritage assets located within 5km of the AONB. Therefore, there could be a positive effect on heritage assets within this area if this land is excluded from an area of search. However, there are also heritage assets within the area of search outside 5km from the AONB which would potentially be subject to increased pressure for development because some choices will be removed. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 There are biodiversity and geodiversity features within 5km of the AONB including European designated sites. Therefore, there could be a positive effect on biodiversity and geodiversity within this area if this land is excluded from an area of search. However, there are also biodiversity and geodiversity |

| SA Objective | Exclude land within the Norfolk Coast AONB (this is the baseline option) | Exclude land within 5km of the Norfolk Coast AONB |
|--|--|---|
| | | features within the area of search outside 5km from the AONB which would potentially be subject to increased pressure for development because some choices will be removed. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0 No difference is expected between the options. Restoration options for silica sand extraction sites would not be affected by the exclusion of land within 5km of the AONB. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 Excluding land within 5km of the AONB is likely to be largely neutral. An AONB has no defined setting. While it is possible that excluding land within 5km of the AONB may prevent degradation of views from within the AONB it is equally likely that for a particular development in a particular location a greater or lesser distance would be required depending on local topography. The type of mitigation measures proposed are also likely to influence the acceptable distance of a mineral extraction site from the AONB. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 No difference between the options is expected |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0/- There are no groundwater source protection zones within the silica sand resource. No differences are expected in water quality. There is a large area of grade 3 agricultural land within 5km of the AONB. However, there is also large area of low grade agricultural land and non –agricultural land within 5km of the AONB. The resource area remaining contains a larger proportion of grade 3 land. Therefore there would be a negative impact on soil quality if this land is excluded from the areas of search. |
| SA11: To promote sustainable use of minerals resources | 0 | - Excluding land within 5km of the AONB reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. Land within 5km of the AONB has previously been used for silica sand extraction and therefore it is expected that silica sand of a suitable quality could be found within this 5km area. |

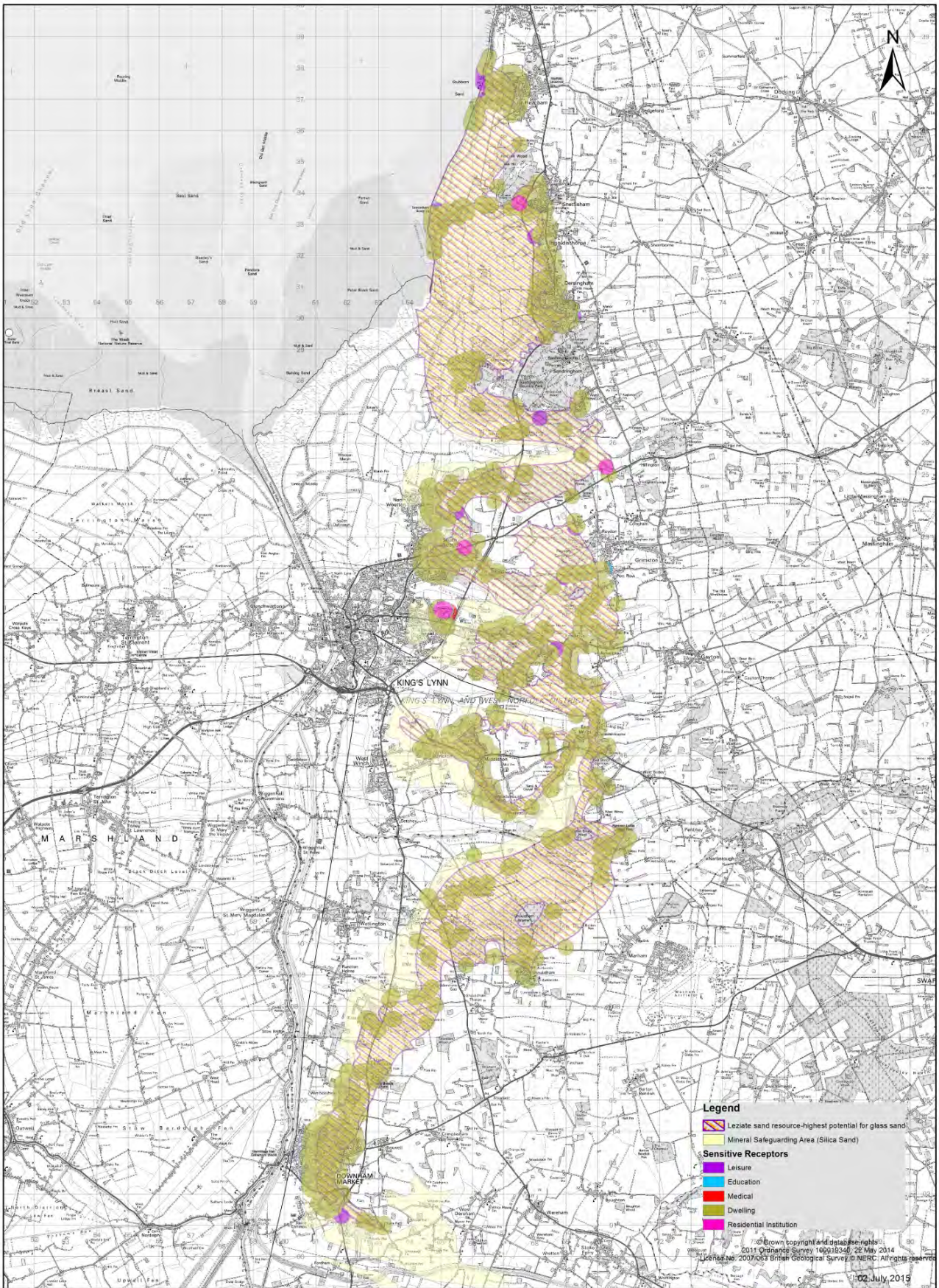
| SA Objective | Exclude land within the Norfolk Coast AONB (this is the baseline option) | Exclude land within 5km of the Norfolk Coast AONB |
|---|---|--|
| | | There would also be an increased transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | + There is land in flood zones 2 and 3 within 5km of the Norfolk Coast AONB which would be excluded from the areas of search if land within 5km of the AONB is excluded. However, silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | - Excluding land within 5km of the Norfolk Coast AONB reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. Land within 5km of the AONB has previously been used for silica sand extraction and therefore it is expected that silica sand of a suitable quality could be found within this 5km area. |
| Conclusion | <p>Excluding land within 5km of the AONB is expected to have negative effects on economic growth, mineral resources and transport impacts because there would be fewer options for locations for silica sand extraction and increased transport distances to the processing plant. Also a negative effect on agricultural land, due to the distribution of agricultural land grades.</p> <p>Excluding land within 5km of the AONB is expected to have positive effects on flood risk due to the large areas of land in flood zones 2 and 3 in this location.</p> <p>There are no differences between the options for the majority of sustainability indicators because whilst there may be positive effects within the 5km area, there could be negative effects outside it due to fewer options for locations of silica sand extraction and therefore increased pressure for development outside the 5km area.</p> <p>It is therefore considered appropriate to only exclude the Norfolk Coast AONB itself from the areas of search and include land within 5km of the AONB.</p> | |

Should areas of search exclude land within 125 metres of sensitive receptors for amenity impacts, or should a different distance be used?

| SA Objective | Exclude land within 125 metres of sensitive receptors (this is the baseline option) | Exclude land within 250 metres of sensitive receptors |
|---|---|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0 No difference between the options is expected. There would not be a significant difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | + Whilst it is considered that a distance of 125 metres from sensitive receptors for amenity impacts is sufficient, with mitigation measures, increasing that distance to 250 metres will further minimise amenity impacts. It is considered that a distance of 125 metres from sensitive receptors for amenity impacts is sufficient, with mitigation measures. However, increasing that distance to 250 metres will further minimise amenity impacts, with lower levels of mitigation necessary. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected because mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 There are likely to be heritage assets located both within 125 metres and 250 metres of sensitive receptors. Therefore no difference between the options is expected. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 No difference between the options is expected. |

| SA Objective | Exclude land within 125 metres of sensitive receptors (this is the baseline option) | Exclude land within 250 metres of sensitive receptors |
|--|---|--|
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0 No difference between the options is expected. Restoration options for silica sand extraction sites would not be affected by the exclusion of land within 250 metres of sensitive receptors. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 No difference between the options is expected. Some land within both 125 metres and 250 metres of sensitive receptors for amenity impacts is within the AONB. However, land within the AONB will be excluded from the areas of search. Excluding land within 250 metres of sensitive receptors for amenity impacts reduces the area of land available to be considered for an area of search. However, the area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | + It is considered that a distance of 125 metres from sensitive receptors for amenity impacts is sufficient, with mitigation measures. However, increasing that distance to 250 metres will further minimise impacts with lower levels of mitigation necessary. No difference between the options is expected regarding the potential for amenity gains (such as footpaths or public open space) on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 No difference between the options is expected. |
| SA11: To promote sustainable use of minerals resources | 0 | -/0 Excluding land within 250 metres of sensitive receptors for amenity impacts reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA12: To reduce the risk of current and | 0 | 0 No difference between the options is |

| SA Objective | Exclude land within 125 metres of sensitive receptors (this is the baseline option) | Exclude land within 250 metres of sensitive receptors |
|---|---|---|
| future flooding at new and existing development | | expected. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | - Excluding land within 250 metres of sensitive receptors for amenity impacts reduces the area of land available to be considered for an area of search. This provides fewer options for future locations of silica sand extraction. |
| Conclusion | There are no differences between the options for the majority of the sustainability indicators. This is mainly due to the location of constraints in relation to sensitive receptors for amenity impacts. Excluding land within 250 metres of sensitive receptors is likely to have positive effects on amenity. However, there are potential negative effects on the use of mineral resources and economic growth because removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction. On balance it is considered that the positive amenity effects of excluding land within 250 metres of sensitive receptors outweigh the affect this has on reducing the options available for areas of search, as specific mitigation methods for amenity impacts on silica sand development within the areas of search are not yet known. | |



2,500 1,250 0 2,500 Metres



Area of Search sieve mapping stage 4: Sensitive receptors

Norfolk County Council

Should areas of search exclude allocated sites and sites with planning permission for non-mineral uses that are located in or adjacent to the silica sand resource, or include this land?

| SA Objective | Exclude land with planning permission or allocated for non-mineral uses (this is the baseline option) | Include land with planning permission or allocated for non-mineral uses |
|---|--|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0 No difference between the options is expected. There would not be a significant difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 No difference between the options is expected. There is not an existing AQMA within the area underlain by the silica sand resource. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 No difference between the options is expected. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 No difference between the options is expected. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 No difference between the options is expected. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0 No difference between the options is expected. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 No difference between the options is expected. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 No difference between the options is expected. |
| SA10: To protect and | 0 | 0 |

| SA Objective | Exclude land with planning permission or allocated for non-mineral uses (this is the baseline option) | Include land with planning permission or allocated for non-mineral uses |
|---|--|---|
| enhance water and soil quality in Norfolk | | No difference between the options is expected. |
| SA11: To promote sustainable use of minerals resources | 0 | 0 No difference between the options is expected. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. Prior extraction of silica sand could occur through implementation of mineral safeguarding policy CS16 even if the land is not included within an area of search for silica sand extraction. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 No difference between the options is expected. Flood risk assessment would be required as part of the local plan and planning application process for both mineral and non-mineral development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | 0 No difference between the options is expected. Prior extraction of silica sand could occur through implementation of mineral safeguarding policy CS16 even if the land is not included within an area of search for silica sand extraction. |
| Conclusion | <p>No difference between the two options is expected because land with planning permission or allocated for non-mineral uses would be expected to be developed for these uses whether or not prior extraction of silica sand takes place. This means that the land would be developed regardless of whether it is within an area of search for silica sand extraction.</p> <p>Excluding land with planning permission, or allocated for non-mineral uses from the areas of search for silica sand extraction is considered to be the correct approach to take because the implementation of Core Strategy Policy CS16 on mineral safeguarding is the provides a more appropriate method to assess whether prior extraction of silica sand should occur in these locations.</p> | |

Should areas of search only include the silica sand resource within the Leziate Beds or should the whole silica sand resource, as mapped by the BGS, be included?

| SA Objective | Include the Leziate Beds only (this is the baseline option) | Include the whole silica sand resource as mapped by the BGS |
|---|--|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0 No difference between the options is expected. There would not be a significant difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. There would not be a significant difference to transport distances between areas of search and the existing processing plant at Leziate. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 No difference between the options is expected. The Leziate Beds cover a smaller land area than the whole silica sand resource. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 No difference between the options is expected. The Leziate Beds cover a smaller land area than the whole silica sand resource. There are heritage assets within both the Leziate Beds and the wider silica sand resource. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 No difference between the options is expected regarding geodiversity. No difference between the options is expected regarding biodiversity. The majority of designated sites for ecology at both the local and national level are located within the Leziate Beds. Restoration options for silica sand extraction, for example to deliver ecological benefits, would not be affected by |

| SA Objective | Include the Leziate Beds only (this is the baseline option) | Include the whole silica sand resource as mapped by the BGS |
|--|--|--|
| | | the size of the resource included in the area of search. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0 No difference between the options is expected. Restoration options for silica sand extraction sites would not be affected by the size of the resource included in the area of search. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 No difference between the options is expected. Part of the Leziate Beds and the wider silica sand resource is within the AONB, however land within the AONB will be excluded from areas of search. The Leziate Beds cover a smaller land area than the whole silica sand resource. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 No difference between the options is expected. There are no groundwater source protection zones within the silica sand resource. Water quality is not expected to be affected by these options. Grade 1 and 2 agricultural land will be excluded from the areas of search anyway. There is some grade 3 agricultural land underlain by both the Leziate Beds and the wider silica sand resource. |
| SA11: To promote sustainable use of minerals resources | 0 | 0 Including the whole silica sand resource in the areas of search provides more options for future locations of silica sand extraction. However, it is most likely that suitable locations for the extraction of silica sand, suitable for glass manufacture, will be from within the Leziate Beds. Therefore including the Leziate Beds only provides more certainty as to where future extraction is likely to take place. There would not be a significant difference to transport distances between areas of search for silica sand extraction and the existing processing plant at Leziate. |

| SA Objective | Include the Leziate Beds only (this is the baseline option) | Include the whole silica sand resource as mapped by the BGS |
|---|--|---|
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 No difference between the options is expected. Including the Leziate Beds only does not remove any significant areas of land at flood risk from the area of search. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | 0 Including the whole silica sand resource in the areas of search provides more options for future locations of silica sand extraction. However, it is most likely that suitable locations for the extraction of silica sand, suitable for glass manufacture, will be from within the Leziate Beds. Therefore including the Leziate Beds only provides more certainty as to where future extraction is likely to take place. |
| Conclusion | <p>There are no differences between the options for the sustainability indicators. This is because generally, constraints (such as amenity, ecology, landscape and heritage assets) either occur in both the Leziate Beds and the wider silica sand resource, or neither of them (such as groundwater source protection zones).</p> <p>The Leziate Beds cover a smaller land area than the whole silica sand resource. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect the majority of potential impacts.</p> <p>It is also more likely that suitable locations for the extraction of silica sand, suitable for glass manufacture, will be from within the Leziate Beds. Therefore, including the Leziate Beds only provides more certainty as to where future extraction is likely to take place.</p> | |

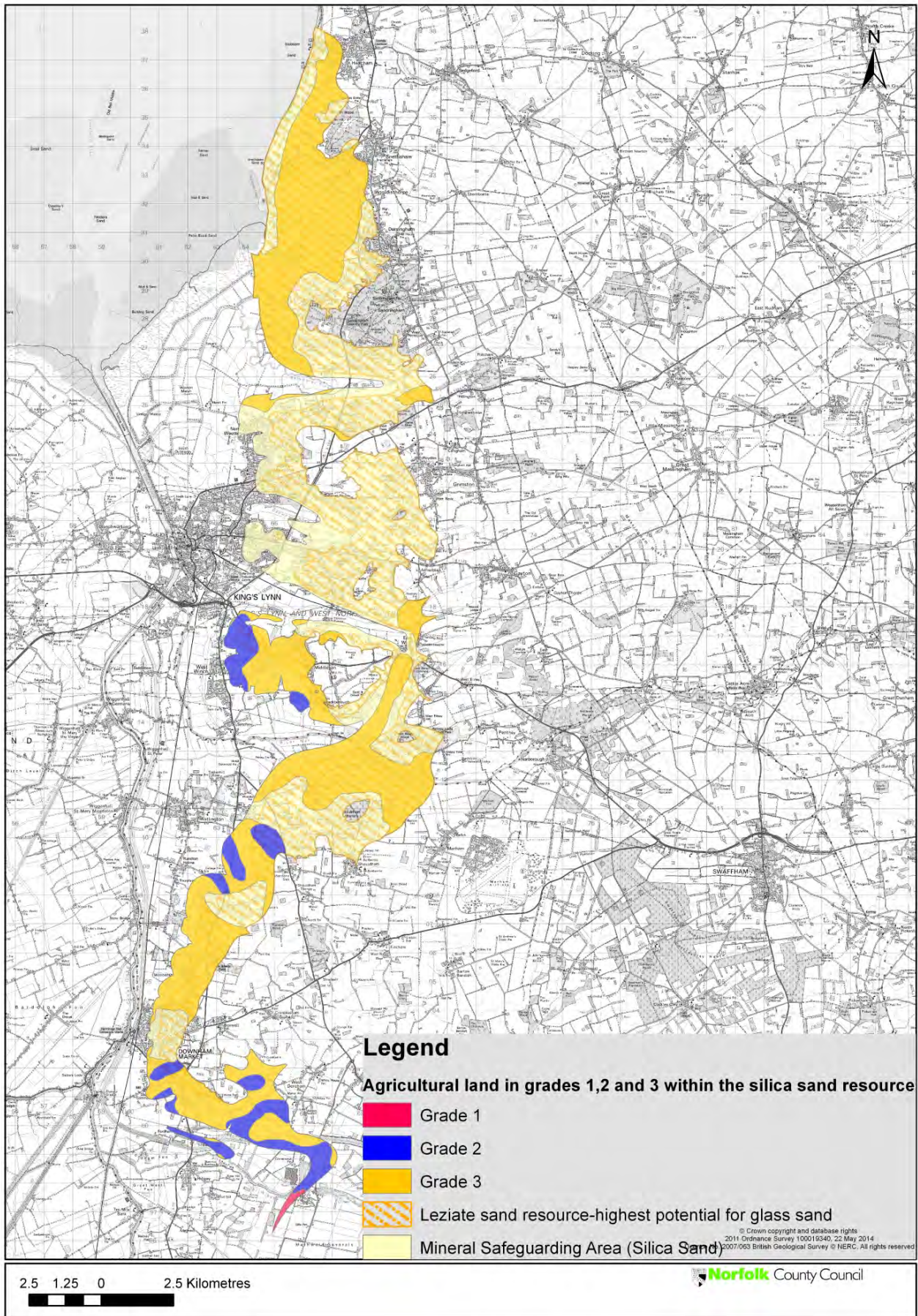


Should areas of search exclude agricultural land grade 3 (good to moderate), or include this land?

| SA Objective | Exclude grade 3 agricultural land (this is the baseline option) | Include grade 3 agricultural land |
|---|--|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | + Including grade 3 agricultural land increases the area of land suitable to be considered for an area of search. There is some grade 3 agricultural land to the south of the existing processing plant. Therefore including grade 3 agricultural land potentially reduces the distance that sand would need to be transported for processing. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 No difference between the options is expected. Including grade 3 agricultural land increases the area of land suitable to be considered for an area of search. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 No difference between the options is expected. There are heritage assets within all grades of agricultural land. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 No difference between the options is expected regarding geodiversity. No difference between the options is expected regarding biodiversity. There are designated sites for ecology within grade 3 land, but also on lower grade and non-agricultural land. Restoration options for silica sand extraction, for example to deliver ecological benefits, would not be affected by whether or not grade 3 land is included within an area of search. |
| SA7: To promote | 0 | 0 |

| SA Objective | Exclude grade 3 agricultural land (this is the baseline option) | Include grade 3 agricultural land |
|--|--|--|
| innovative solutions for the restoration and after use of minerals sites | | No difference between the options is expected. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 No difference between the options is expected. Some grade 3 agricultural land is within the AONB, however land within the AONB will be excluded from areas of search. Including grade 3 agricultural land in areas of search would cover a larger land area than excluding grade 3 land. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0/- There are no groundwater source protection zones within the silica sand resource. Therefore they will not be affected by which grades of agricultural land are included. Water quality is not expected to be affected by the agricultural land grades included in the areas of search. Including grade 3 agricultural land within the areas of search could lead to the loss of grade 3a agricultural land. This loss could be temporary or permanent, depending on the timescale for silica sand extraction and whether the site is subsequently restored back to agricultural use. |
| SA11: To promote sustainable use of minerals resources | 0 | + Including grade 3 agricultural land in the areas of search provides more options for future locations of silica sand extraction. There is some grade 3 agricultural land to the south of the existing processing plant. Therefore including grade 3 agricultural land potentially reduces the distance that sand would need to be transported for processing. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 A large area in the north of the silica sand resource is both grade 3 land and at risk of flooding. However there is not this correlation between all grade 3 land and flood risk zones. Silica sand extraction is water compatible development therefore no difference between |

| SA Objective | Exclude grade 3 agricultural land (this is the baseline option) | Include grade 3 agricultural land |
|---|---|--|
| | | the options is expected. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | +/- Including grade 3 land increases the area of land suitable to be considered for an area of search. This provides more options for future locations of silica sand extraction. The timescale of the silica sand operations and the type of restoration would affect how long the land would not be in productive agricultural use. |
| Conclusion | <p>There are no differences between the options for the majority of the sustainability indicators. This is because generally constraints (such as amenity, ecology, landscape and heritage assets) either occur in both grade 3 and other grades of agricultural and non-agricultural land, or none of them (such as groundwater source protection zones).</p> <p>The main benefits of including grade 3 agricultural land are that this provides more options for future locations of silica sand extraction. The only potential negative effects are the temporary or permanent loss of grade 3a agricultural land to silica sand extraction, depending on the final restoration of the site. Due to the national importance of silica sand this is considered to be an acceptable trade off.</p> | |

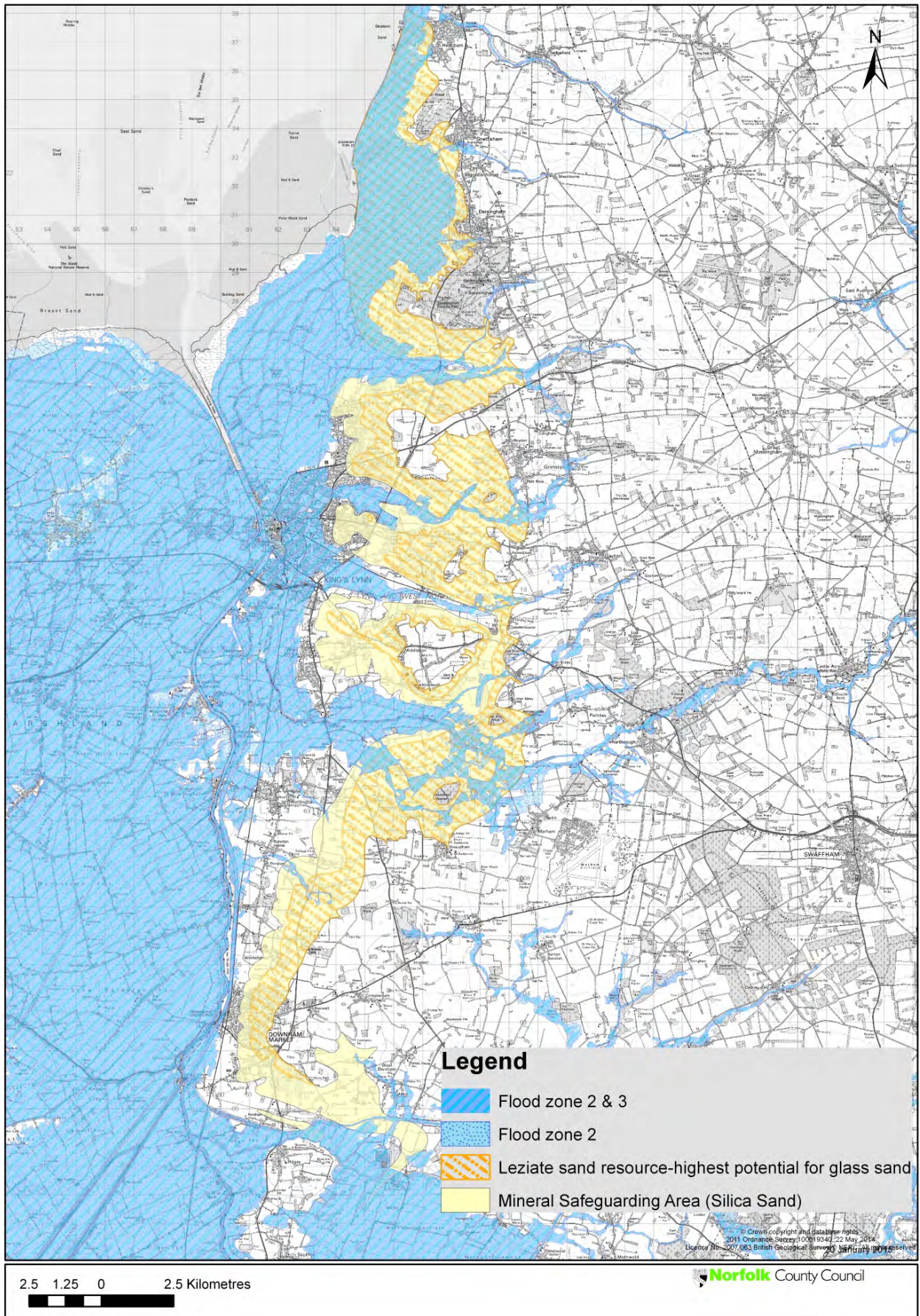


Should areas of search exclude land in flood zones 2 and 3, or include this land?

| SA Objective | Exclude land in flood zones 2 & 3 (this is the baseline option) | Include land in flood zones 2 and 3 |
|---|--|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | 0 No difference between the options is expected. Silica sand extraction is water compatible development. Including land in flood zones 2 and 3 would not affect the distance that sand would need to be transported for processing. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0 No difference between the options is expected. The existing AQMAs are within King's Lynn and would not be affected. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 No difference between the options is expected. Including land in flood zones 2 and 3 increases the area of land suitable to be considered for an area of search. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0 No difference between the options is expected. There are likely to be heritage assets located in all flood zones. Effects are not expected on the townscape because extraction will not take place in urban areas. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 No difference between the options is expected regarding geodiversity. No difference between the options is expected regarding biodiversity. There are designated sites for ecology within land in flood zones 2 and 3, but also on land in flood zone 1. Restoration options for silica sand extraction, for example to deliver ecological benefits, are unlikely to be affected by whether or not land in flood zones 2 and 3 are included within an area of search. |
| SA7: To promote innovative solutions for the restoration and after | 0 | + There is the potential for additional flood storage capacity to be provided on restoration |

| SA Objective | Exclude land in flood zones 2 & 3 (this is the baseline option) | Include land in flood zones 2 and 3 |
|--|---|--|
| use of minerals sites | | of a silica sand extraction site in flood zones 2 or 3. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 No difference between the options is expected. Some land in flood zones 2 and 3 is within the AONB, however land within the AONB will be excluded from areas of search. Including land in flood zones 2 and 3 within areas of search would cover a larger land area than excluding them. The area of search is an area within which planning permission may be granted for a more specific parcel of land and therefore the size of the area of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 No difference between the options is expected. There are no groundwater source protection zones within the silica sand resource. Water quality is not expected to be affected by the inclusion of grade 2 and 3 flood risk zones. All grades of agricultural land and non-agricultural land fall within flood zones 2 and 3. Therefore there is no direct impact on soil quality from including land in flood zones 2 and 3 within the areas of search. |
| SA11: To promote sustainable use of minerals resources | 0 | + Including land in flood zones 2 and 3 in the areas of search provides more options for future locations of silica sand extraction. Including land in flood zones 2 and 3 would not affect the distance that sand would need to be transported for processing. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 Silica sand extraction is water compatible development. However, land in flood zone 1 is preferable for development and the sequential test should be used in the selection of areas for silica sand extraction. There is the potential for additional flood storage capacity to be provided on restoration of a silica sand extraction site in flood zones 2 or 3. |
| SA13: To encourage employment opportunities and | 0 | 0 Including land in flood zones 2 and 3 increases the area of land suitable to be |

| SA Objective | Exclude land in flood zones 2 & 3 (this is the baseline option) | Include land in flood zones 2 and 3 |
|-------------------------|--|---|
| promote economic growth | | considered for an area of search. This provides more options for future locations of silica sand extraction. Silica sand extraction is 'water compatible' development. Therefore it is not considered that this will affect employment and economic growth. |
| Conclusion | <p>There are no differences between the options for the majority of the sustainability indicators. This is because generally constraints (such as amenity, ecology, landscape and heritage assets) either occur in all flood zones, or none of them (such as groundwater source protection zones).</p> <p>The main benefits of including flood zones 2 and 3 are that this provides more options for future locations of silica sand extraction because silica sand extraction is water compatible development.</p> <p>There is also the potential for additional flood storage capacity to be provided on restoration of a silica sand extraction site.</p> | |



Should an area of search be at least 20 hectares in area or should all areas of search be considered?

| SA Objective | Areas of search to be at least 20 hectares in area (this is the baseline option) | All areas of search to be considered regardless of size |
|---|--|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | 0 | + Some of the potential areas of search which are less than 20 hectares in size are located near to the processing plant at Leziate. Therefore excluding these areas of search potentially increases the distance that silica sand would need to be transported for processing. However, it is considered unlikely that sites of less than 20 hectares in size would be developed. |
| SA2: To improve air quality in line with the National Air Quality Standards | 0 | 0/+ The existing AQMAs are within King's Lynn and would not be affected. However, some of the potential areas of search which are less than 20 hectares in size are located near to the processing plant at Leziate. Therefore excluding these areas of search potentially increases the distances that silica sand would need to be transported for processing. However, it is considered unlikely that sites of less than 20 hectares in size would be developed. |
| SA3: To minimise noise, vibration and visual intrusion | 0 | 0 No difference between the options is expected because the areas of search are all at least 250 metres from sensitive receptors for amenity impacts. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | 0 | 0 No difference between the options is expected. |
| SA5: To maintain and enhance the character of the townscape and historic environment | 0 | 0/+ Effects are not expected on the townscape because extraction will not take place in urban areas. The sieve mapping process means that all potential areas of search are at least 250metres from heritage assets. While the setting of an asset may extend further than 250m this is no more likely for areas under 20 hectares than over. Including areas of search under 20 hectares would mean that the choice of potential locations for extraction was greater. Therefore, more opportunities would be available outside the setting of a heritage asset. However, it is considered unlikely that sites of less than 20 hectares in size would be |

| SA Objective | Areas of search to be at least 20 hectares in area (this is the baseline option) | All areas of search to be considered regardless of size |
|--|--|--|
| | | developed. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | 0 | 0 No difference between the options is expected on geodiversity or biodiversity. The smaller sites exhibit the same general relationship with biodiversity and geodiversity sites as the larger sites over 20 hectares. However, it is considered unlikely that sites of less than 20 hectares in size would be developed. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | 0 | 0 No difference between the options is expected. Restoration options for silica sand extraction sites would not be affected by the minimum size of areas of search. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | 0 | 0 No difference between the options is expected. The areas of search exclude land within the AONB. Including all areas of search regardless of size means that there would be more areas of search covering a greater total land area. The areas of search are areas within which planning permission may be granted for a more specific parcel of land and therefore the aggregated size of the areas of search does not affect potential landscape impacts. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | 0 | 0 No difference between the options is expected. |
| SA10: To protect and enhance water and soil quality in Norfolk | 0 | 0 There are no groundwater source protection zones within the silica sand resource. Surface water quality will not be affected by the options. In terms of soil quality, the areas of search exclude grade 1 and 2 agricultural land. A few of the areas of search of less than 20 hectares are on grade 3 agricultural land. However, it is considered unlikely that sites of less than 20 hectares in size would be developed. |
| SA11: To promote sustainable use of minerals resources | 0 | 0 Including all potential areas of search regardless of size will theoretically provide more options for future locations of silica sand extraction. However, it is unlikely that extraction sites will come forward for less than 20 hectares of land and therefore smaller areas of search are unlikely to be developed. |

| SA Objective | Areas of search to be at least 20 hectares in area (this is the baseline option) | All areas of search to be considered regardless of size |
|---|---|---|
| | | Therefore it is not considered that this option will affect the supply of silica sand. |
| SA12: To reduce the risk of current and future flooding at new and existing development | 0 | 0 No difference between the options is expected. Only one of the potential areas of search that are less than 20 hectares in size has any land within flood zone 2 or 3. Silica sand extraction is water compatible development. |
| SA13: To encourage employment opportunities and promote economic growth | 0 | 0 Including all potential areas of search regardless of size will theoretically provide more options for future locations of silica sand extraction. However, it is unlikely that extraction sites will come forward for less than 20 hectares of land and therefore smaller areas of search are unlikely to be developed. Therefore it is not considered that this option will affect employment and economic growth. |
| Conclusion | There are no differences between the options for the majority of sustainability indicators. This is because all areas of search have been defined using the same methodology and therefore areas of search above and below 20 hectares in size will be located at the same minimum distances from a range of planning constraints. There are potential positive effects if all areas of search are included regardless of size because some of the areas of search of less than 20 hectares are close to the existing processing plant at Leziate. Including all areas of search regardless of size will theoretically provide more options for future locations of silica sand extraction. However, it is unlikely that extraction sites will come forward for less than 20 hectares of land and therefore smaller areas of search are unlikely to be developed. | |

4.2 Conclusions of the Sustainability Appraisal on the strategic options for defining areas of search

A summary of the conclusions of the Sustainability Appraisal of the strategic options for defining areas of search for silica sand extraction are as follows and the areas of search have been defined using the following criteria:

Exclude land within the hydrological catchments of Roydon Common and Dersingham Bog SAC from the areas of search

There are no differences between the options for the majority of the sustainability indicators. There would be a positive effect on biodiversity by excluding land based on hydrological catchments because it would remove land where the potential to impact on water dependent features is higher. The potential negative effects are that removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction closest to the Leziate. Overall it is considered that excluding land based on hydrological catchments from an area of search is considered to be an acceptable approach due to the international importance of Roydon Common and Dersingham Bog.

Exclude land within 250 metres of The Wash from the areas of search

There are no differences between the options for the majority of the sustainability indicators. There could be a positive effect on biodiversity from excluding land within 500 metres of The Wash. However, either option may not exclude functional habitat for The Wash as bird species may forage further inland. It is considered that potential disturbance to birds from noise and light from silica sand extraction operations will be no greater at 250 metres than at 500 metres. Noise and light can also be controlled by planning conditions. The potential negative effect is that removing a larger area of land from consideration reduces the options available for future locations of silica sand extraction. On balance only land within 250 metres of The Wash will be excluded from the areas of search because it is considered that the impacts on functional habitat would be better assessed at the level of individual areas of search.

Exclude land within 250 metres of SSSIs from the areas of search

Excluding land within 3km of SSSIs with biological features removes a significant area of the silica sand resource which would pose major difficulties in being able to define sufficient areas of search to meet the shortfall. There would be significant negative effects on a number of sustainability objectives and limited positive effects. It is not considered necessary to exclude 3km around all SSSIs to avoid negative effects on biodiversity. Therefore, it is considered appropriate to only exclude land within 250 metres of biological SSSIs; the impacts on individual SSSIs would be better assessed at the level of individual areas of search.

Exclude land within 250 metres of ancient woodland from the areas of search

There are no differences between the options for the majority of sustainability indicators. On balance it is considered that the positive biodiversity effects of excluding land within 250 metres of ancient woodland sites outweigh the affect this has on reducing the options available for areas of search because the area of land excluded is a very small area of the silica sand resource.

Exclude land within 250 metres of designated heritage assets from the areas of search

Due to the significant number of negative impacts expected from excluding land within 1km of designated heritage assets it is considered to be appropriate to only exclude land within 250 metres of designated heritage assets. The setting of a heritage asset is likely to be different for each heritage asset and therefore excluding land within 1km of every designated heritage assets is not an appropriate way to ensure no adverse impacts on heritage assets. A full

assessment of potential impacts on designated heritage assets would be more appropriately carried out at the level of individual areas of search.

Exclude land within the Norfolk Coast AONB from the areas of search

Excluding land within 5km of the AONB is expected to have negative effects on economic growth, mineral resources, transport impacts and agricultural land and positive effects on flood risk. There are no differences between the options for the majority of sustainability indicators because whilst there may be positive effects within the 5km area, there could be negative effects outside it due to increased development pressure. It is therefore considered appropriate to only exclude the Norfolk Coast AONB itself from the areas of search and include land within 5km of the AONB.

Exclude land within 250 metres of sensitive receptors for amenity impacts from the areas of search

There are no differences between the options for the majority of the sustainability indicators. Excluding land within 250 metres of sensitive receptors is likely to have positive effects on amenity. On balance it is considered that the positive amenity effects of excluding land within 250 metres of sensitive receptors outweigh the affect this has on reducing the options available for areas of search, as specific mitigation methods for amenity impacts on silica sand development within the areas of search are not yet known.

Exclude land with planning permission or allocated for non-mineral uses from the areas of search

No difference between the two options is expected. Excluding land with planning permission, or allocated for non-mineral uses from the areas of search for silica sand extraction is considered to be the correct approach to take because the implementation of Core Strategy Policy CS16 on mineral safeguarding is the provides a more appropriate method to assess whether prior extraction of silica sand should occur in these locations.

Only include the Leziate Beds mineral deposit within the areas of search

There are no differences between the options for the sustainability indicators. It is more likely that suitable locations for the extraction of silica sand, suitable for glass manufacture, will be from within the Leziate Beds. Therefore, including the Leziate Beds only provides more certainty as to where future extraction is likely to take place.

Include grade 3 agricultural land within the areas of search

There are no differences between the options for the majority of the sustainability indicators. The main benefits of including grade 3 agricultural land are that this provides more options for future locations of silica sand extraction. The only potential negative effects are the temporary or permanent loss of grade 3 agricultural land to silica sand extraction, depending on the final restoration of the site. Due to the national importance of silica sand this is considered to be an acceptable trade off.

Include land within Flood Zones 2 and 3 within the areas of search

There are no differences between the options for the majority of the sustainability indicators. The main benefits of including flood zones 2 and 3 are that this provides more options for future locations of silica sand extraction because silica sand extraction is water compatible development. There is also the potential for additional flood storage capacity to be provided on restoration of a silica sand extraction site.

Areas of search to be at least 20 hectares in size

There are no differences between the options for the majority of sustainability indicators. Including all areas of search regardless of size will theoretically provide more options for future locations of silica sand extraction. However, it is unlikely that extraction sites will come forward for less than 20 hectares of land and therefore smaller areas of search are unlikely to be developed.

5. Predicting the effects of the Silica Sand Review including alternatives (Task B3)

5.1 One specific site was proposed by a mineral operator for silica sand extraction, in response to the 'call for sites' in June 2015. This site is referred to as SIL 01 – land at Mintlyn South. Even if it is acceptable for silica sand extraction, site SIL 01 has an estimated silica sand resource of 1.2 million tonnes which is not sufficient on its own to meet the forecast shortfall of 2.5 million tonnes of silica sand, in the period up to 2026. Therefore planning officers have defined areas of search using the following methodology:

- a. The starting point for the areas of search is the extent of the Leziate Beds silica sand resource.
- b. The Norfolk Coast Area of Outstanding Natural Beauty has been excluded
- c. All ancient woodland sites and 250 metres around them has been excluded
- d. All SSSIs and 250 metres around them has been excluded (except for Roydon Common and Dersingham Bog – see below)
- e. The hydrological catchments for Roydon Common and Dersingham Bog have been excluded
- f. Designated heritage assets (listed buildings, scheduled monuments, conservation areas, registered historic parks and gardens) and 250 metres around each heritage asset has been excluded
- g. Sensitive receptors to amenity impacts (residential dwellings, education facilities, workplaces, healthcare and leisure facilities) and 250 metres around each sensitive receptor have been excluded
- h. Agricultural land grades 1 and 2 have been excluded
- i. Allocated, current and restored mineral extraction sites have been excluded
- j. Registered Common Land has been excluded
- k. The areas of the Leziate Beds silica sand resource that were remaining at this point were all potential areas of search
- l. Potential Areas of search below 20 hectares in size have not been taken further
- m. The remaining ten areas of search are above 20 hectares in size

This process identified the following ten potential areas of search:

| Reference | Size (hectares) | Located in these parishes |
|-----------|-----------------|---|
| AOS A | 548 | Ingoldisthorpe, Snettisham, Dersingham |
| AOS B | 240 | Heacham, Snettisham |
| AOS C | 65 | Hillington, Fritcham with Appleton |
| AOS D | 142 | East Winch, Pentney |
| AOS E | 979 | Wormegay, Shouldham, Marham, Tottenhill, Shouldham Thorpe |
| AOS F | 234 | Runcton Holme, Stow Bardolph |
| AOS G | 34 | Bawsey |
| AOS H | 29 | Bawsey |
| AOS I | 52 | Runcton Holme, Shouldham Thorpe, Tottenhill |
| AOS J | 24 | Tottenhill, Wormegay |

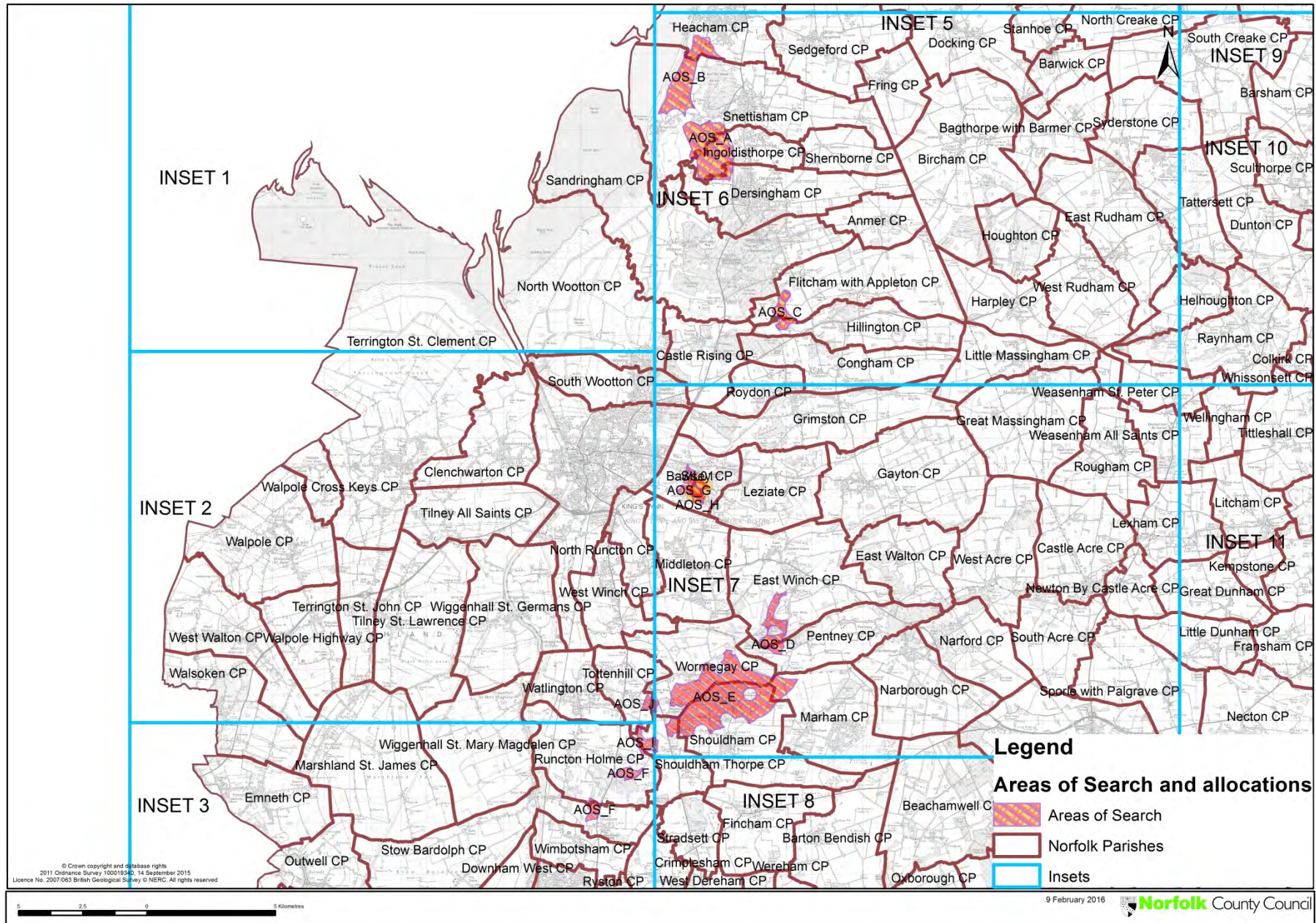
5.2 A sustainability appraisal was carried out on the specific site and ten areas of search which are the alternative options in the Silica Sand Review. Matrices were used to predict and evaluate how silica sand extraction within the areas of search and specific site would affect the sustainability objectives and the indicators that comprise the sustainability baseline. The matrices were published in the Initial Sustainability Appraisal (October 2015). A consultation on the **Initial Sustainability Appraisal** and the **Preferred Options Consultation** document,

which contained the specific site and ten areas of search, was carried out from 6 November to 21 December 2015.

5.3 Taking into account the results of the Initial Sustainability Appraisal, the site and area of search assessments and responses to the Preferred Options consultation, the boundaries of a number of areas of search were amended to reduce adverse impacts where possible. No amendments were made to the specific site, but the boundary amendments resulted in the following changes to the areas of search:

| Reference | Size (hectares) | Located in these parishes | Change |
|------------------|------------------------|---|---|
| AOS A | 328 | Ingoldisthorpe, Snettisham, Dersingham | Reduced size (220 hectares less) |
| AOS B | 240 | Heacham, Snettisham | No change |
| AOS C | 65 | Hillington, Flitcham with Appleton | No change |
| AOS D | 109 | East Winch, Pentney | Reduced size (33 hectares less) |
| AOS E | 816 | Wormegay, Shouldham, Marham, Shouldham Thorpe | Reduced size (163 hectares less) |
| AOS F | 61 | Runton Holme, Stow Bardolph | Reduced size (173 hectares less) |
| AOS G | 34 | Bawsey | No change |
| AOS H | 29 | Bawsey | No change |
| AOS I | 47 | Runton Holme, Shouldham Thorpe, Tottenhill | Slightly reduced size (5 hectares less) |
| AOS J | 23 | Tottenhill, Wormegay | Slightly reduced size (1 hectare less) |

5.4 The matrices used in assessing the effects of the specific site and the areas of search, taking into account the revised boundaries, are published in the following pages of this Sustainability Appraisal Report.



Legend




Areas of Search and allocations

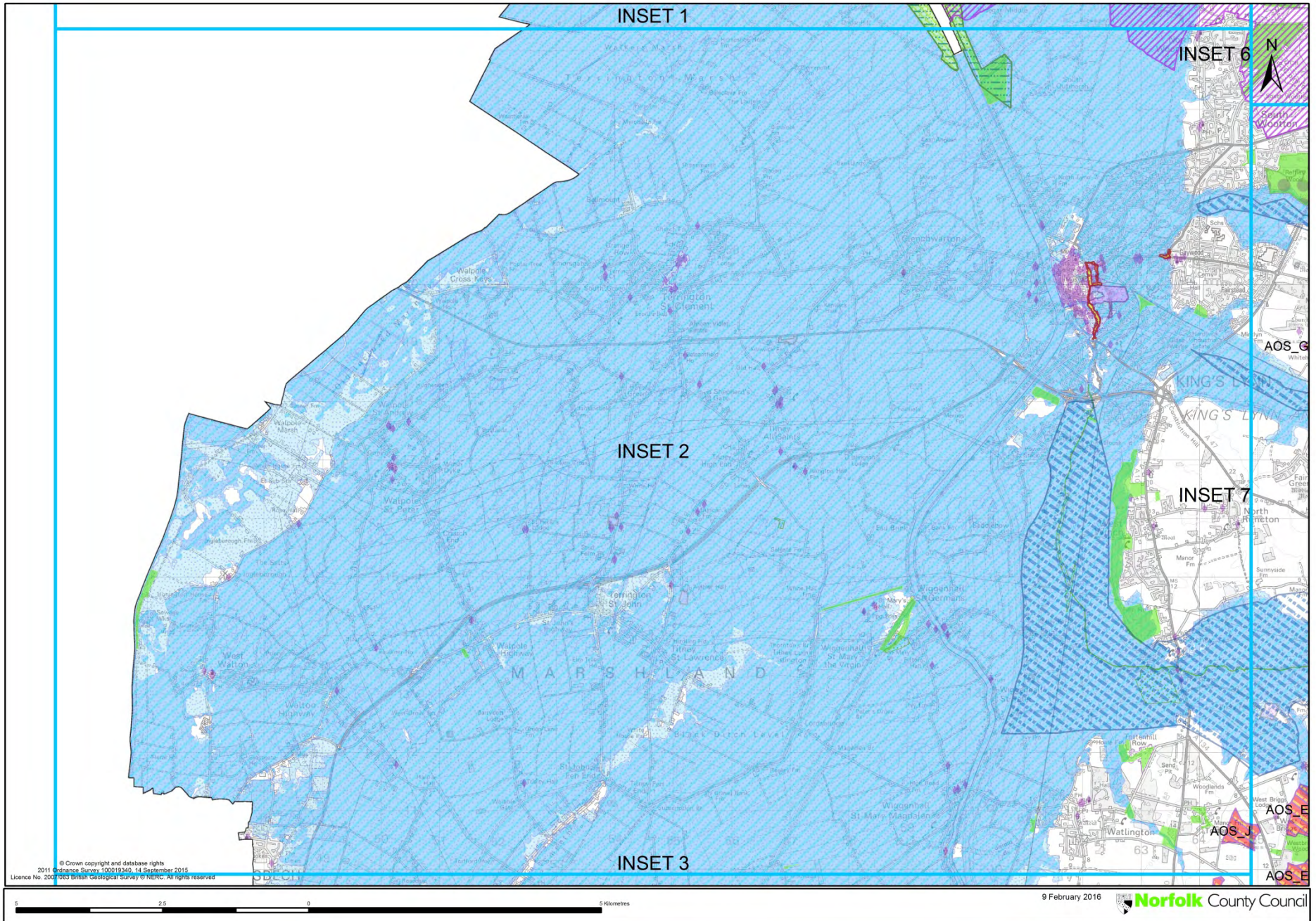
-  Areas of Search
-  Air Quality Management Area (AQMA)
-  Core River Valleys
-  Area of Outstanding Natural Beauty (AONB)
-  County Boundary
-  National Nature Reserves
-  Special Protection Area (SPA)
-  Special Area of Conservation (SAC)
-  Site of Special Scientific Interest (SSSI)
-  Ramsar sites
-  County Wildlife Sites
-  Ancient Woodland
-  Regionally Important Geological Sites (RIGS)

Heritage designations

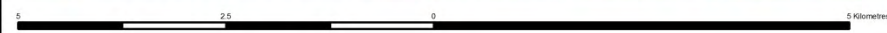
-  Registered Historic Parks and Gardens
-  Scheduled Monuments
-  Listed Buildings
-  Conservation Areas

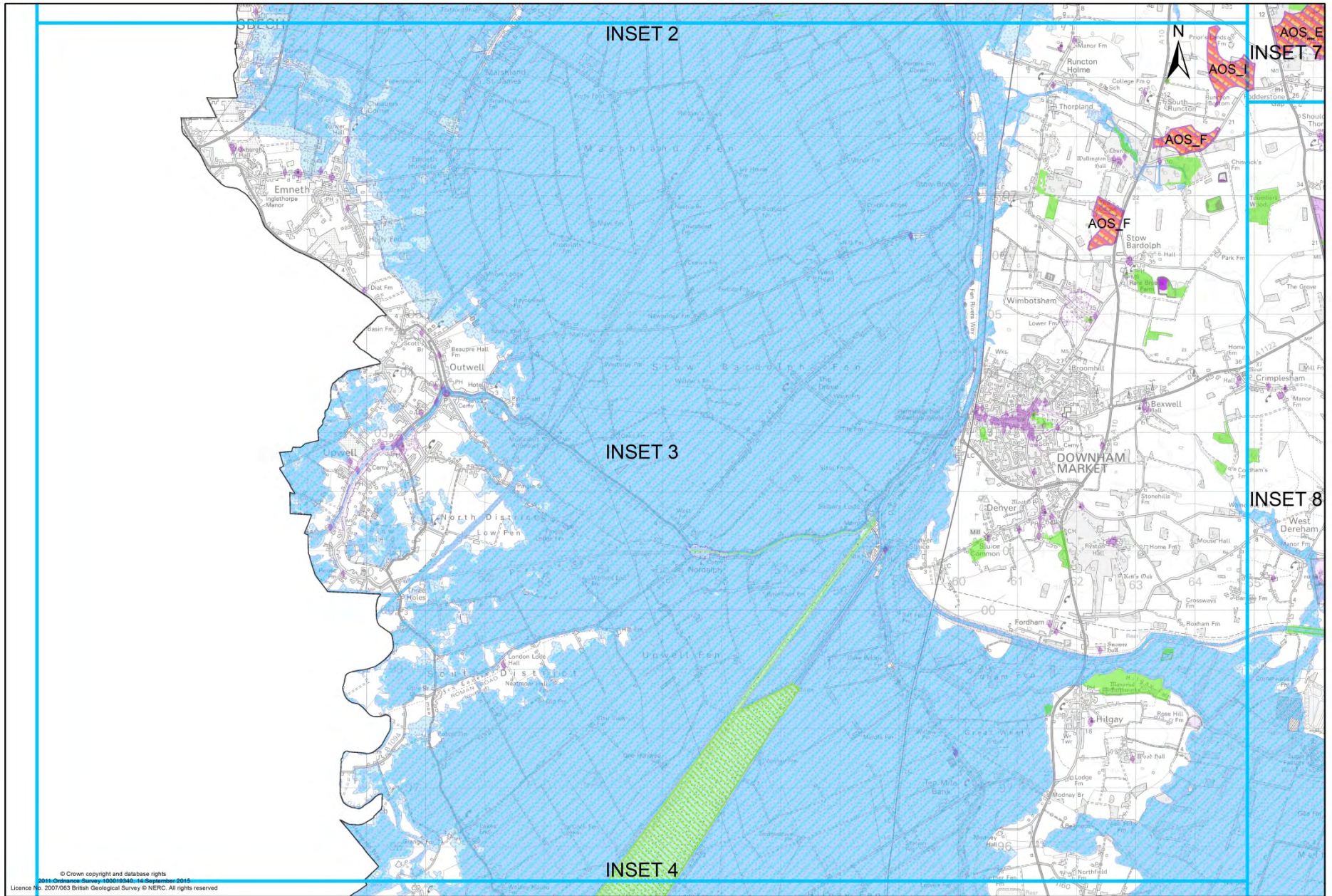
Environment Agency designations

-  Groundwater Source Protection Zone 1
-  Flood zone 2 & 3
-  Flood zone 2



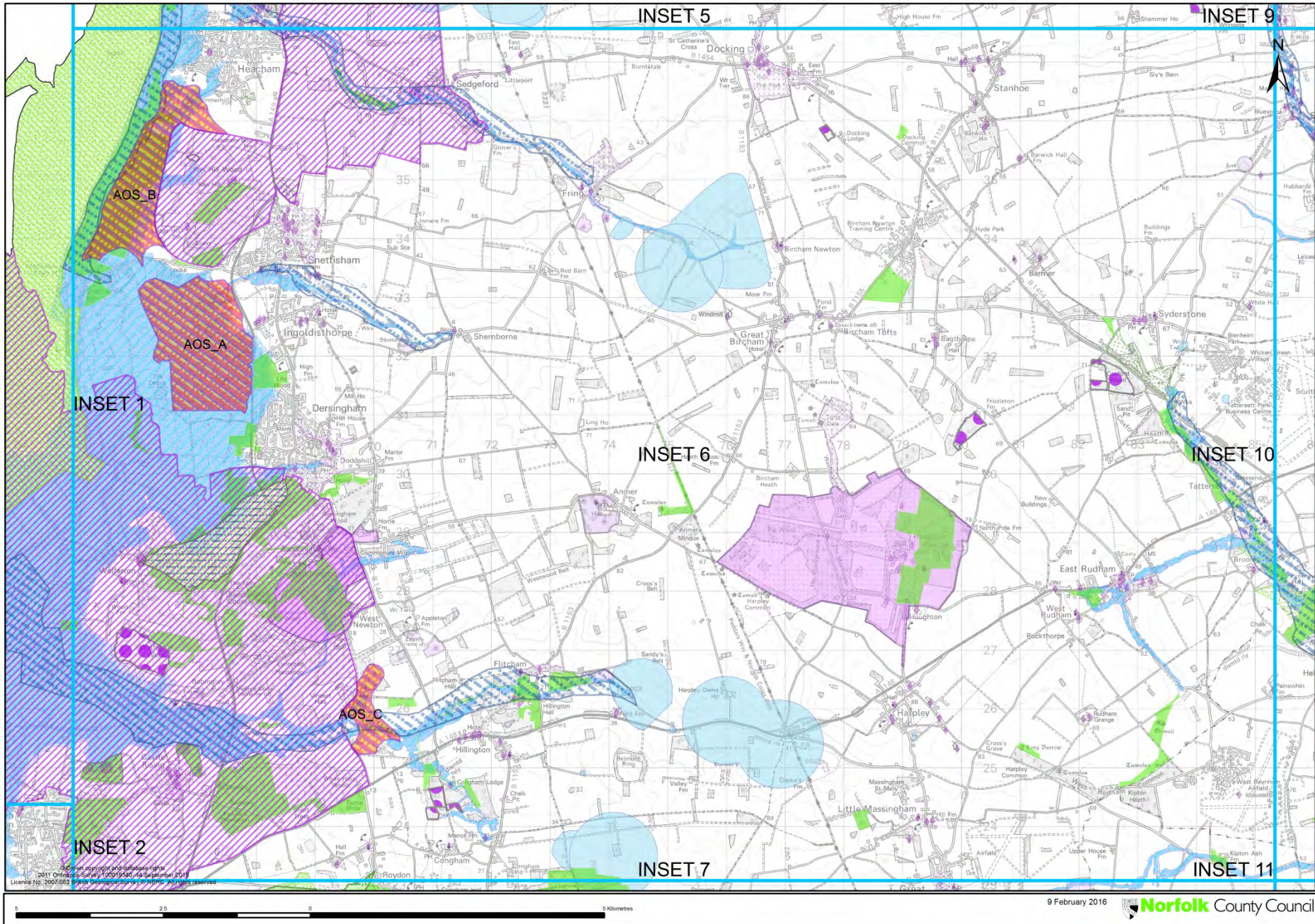
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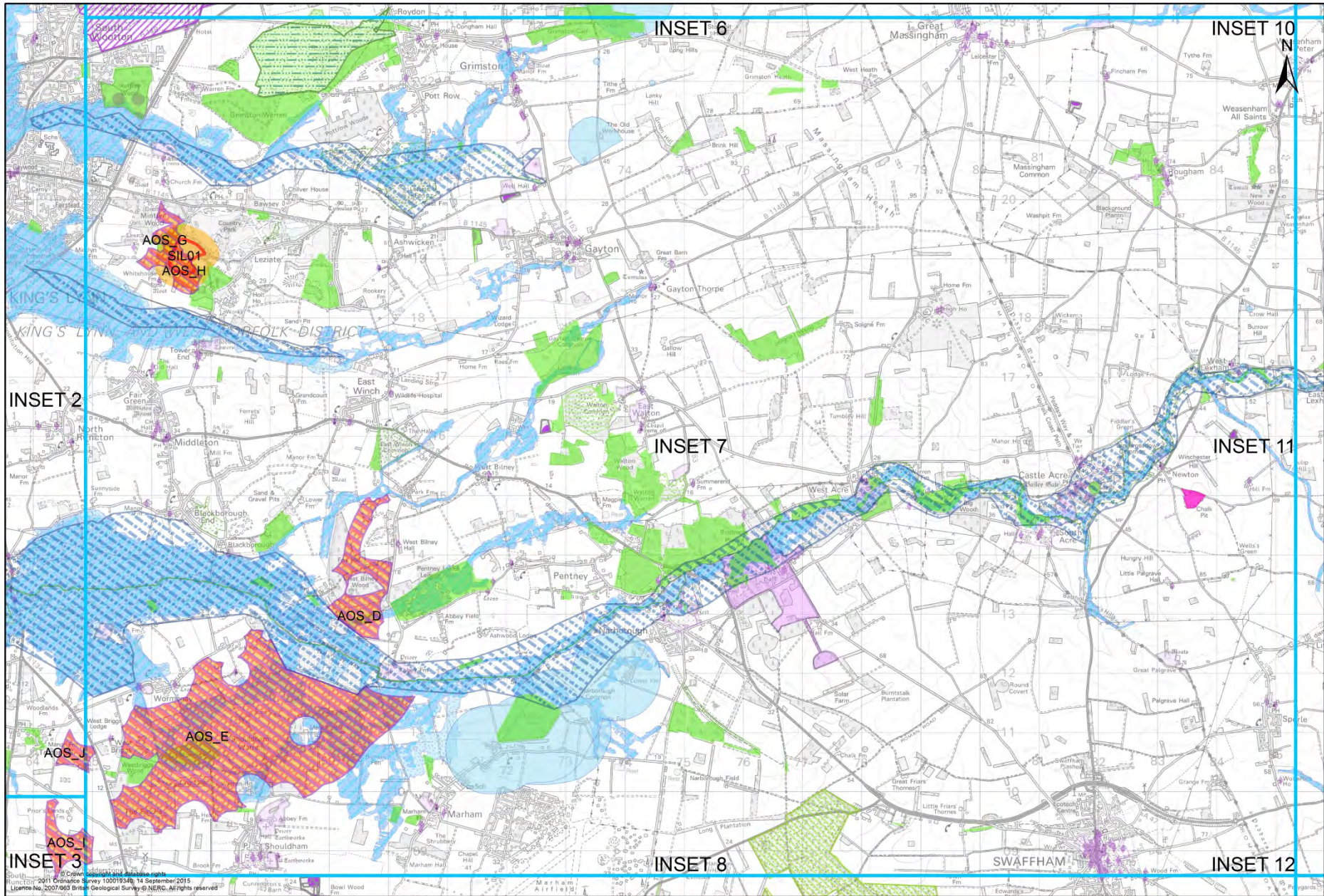




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Site SIL01 – land at Mintlyn South

Site area: 21 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The site is approximately 700 metres from the Leziat processing plant. The proposer of the site has indicated that the mineral would be transferred by conveyor to the processing plant. | ++ Mineral extraction requires energy and therefore emits CO ₂ . However, there would not be CO ₂ emissions from road transportation to the processing plant. | 0 No contributions to climate change post extraction. Restoration is unlikely to include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The site is not within an AQMA. Mineral extracted at the site should not lead to increased road transport due to its proximity to the processing plant. | 0 There should not be any adverse air quality impacts because the mineral will not need to be transported by road. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 280 metres from the site boundary. Leziat is approximately 600 metres from the site boundary. | 0 It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. Silica sand extraction is not expected to cause vibration. Any future planning application on the site will need to ensure that proposed extraction is appropriately screened to mitigate visual intrusion. | 0 No effect post restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. The effect on employment is assessed under objective SA13. | 0 No effects expected during extraction. | 0 It is unlikely that enhanced public access would be provided within the site on restoration. |
| SA5: To maintain and enhance the character | The nearest listed building to the site is | - A future application | - A mitigation strategy |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|---|---|
| of the townscape and historic environment | 306m away and is the front against south façade of Whitehouse Farmhouse. There are 13 listed buildings within 2km of the site. There are no Conservation Areas or Historic Parks and Gardens within 2km of the site. The site contains assets of archaeological interest. | should provide appropriate archaeological evaluation, which may provide an opportunity to investigate heritage assets that would not otherwise take place. A Heritage Statement should also be included, together, with appropriate mitigation. It is considered that mitigation measures are likely to result in extraction being able to take place with no unacceptable adverse impacts. | should ensure, the historic value of, assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <p>Roydon Common SAC and Ramsar site is 2.8km from the site boundary.</p> <p>Leziate, Sugar and Derby Fen SSSI is less than 3km from the site.</p> <p>County Wildlife Site 416 '70 & 100 plantations' is partially located within the site. CWS 418 Haverlesse Manor Plantation is located adjacent to the site. CWS 422 The Holt is 260 metres from the site.</p> | <p>-</p> <p>The majority of the site is outside the hydrological catchment for Roydon Common and for Leziate, Sugar and Derby Fens and down gradient of these sites. In addition, Bawsey Lakes are located inbetween the site and the SSSIs. Therefore no adverse impacts are expected on the SSSIs.</p> <p>Mineral extraction on the site would adversely affect CWS 416. Adjacent CWS418 could also be adversely affected due to proximity. Mitigation measures will therefore be required.</p> | <p>0</p> <p>No adverse impacts on the SSSIs are expected post extraction.</p> <p>If the site is restored to nature conservation, there could be a biodiversity enhancement, even if the existing CWS 416 is adversely affected during mineral extraction. Restoration could also benefit the adjacent CWS if additional conservation habitat is created.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|---|---|---|
| | <p>The closest ancient woodland site is Reffley Wood, a PAWS, which is over 2.1km from the area of search boundary.</p> <p>The AoS has overburden, made up of Head deposits which are priority features due to their method of formation.</p> | <p>No adverse impacts on ancient woodland sites are expected due to distance from the site.</p> <p>There is the potential for sites within this area to contain other examples of geodiversity priority features.</p> | <p>No adverse impacts on ancient woodland are expected post restoration.</p> <p>There would be a preference for restoration to provide opportunities for geological research of suitable exposures. However, this may not always be possible.</p> |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | The preferred restoration for this site would be lowland heathland and acid grassland which would provide a net biodiversity gain. | 0 No effect during extraction phase | + There would be a positive effect for biodiversity if this site is restored to lowland heathland and dry acid grassland. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | The site is not within a Core River Valley, or other designated landscape feature. The site includes some areas which have been partially worked for silica sand in the past. | 0 It is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape. | 0 Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. Waterbodies, woodland, heathland and farmland all form landscape features within the site. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | There are no public footpaths within the site. The nearest residential property is approximately 280 metres from the site boundary. | 0 There is unlikely to be a significant impact on health or amenity from mineral extraction within the site. | 0 It is unlikely that there would be new public footpaths provided within the site on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | The site is located over a principal aquifer and partially over a secondary B aquifer; but it mainly overlays an unproductive secondary aquifer. There are no Groundwater Source Protection Zones | 0 A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts on water resources from dewatering operations | 0 Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|---|--|
| | <p>within the proposed site.</p> <p>The site is classified as non-agricultural land.</p> | <p>undertaken to enable mineral extraction,</p> <p>No impacts on BMV agricultural soils.</p> | <p>No impacts on BMV agricultural soils.</p> |
| SA11: To promote sustainable use of minerals resources | The site is approximately 700 metres from the Leziate processing plant. | <p>++</p> <p>Due to proximity to processing plant.</p> | <p>0</p> <p>No effect post extraction</p> |
| SA12: To reduce the risk of current and future flooding at new and existing development | <p>The site has a low probability of flooding from rivers within the borough council SFRA.</p> <p>Surface water flooding extents occur within SIL 01, none of the site has a high probability (greater than 1 in 30) of being affected by surface water flooding; 0.71% of the area has a medium probability (between 1 in 30 and 1 in 100) of surface water flooding and 3.71% of the area has a low probability (between 1 in 100 and 1 in 1000) of surface water flooding.</p> | <p>++</p> <p>The site is at generally low risk of being affected by flooding from either rivers, the sea or surface water.</p> | <p>+</p> <p>There is potential for restoration to involve the creation of water bodies to provide flood storage capacity.</p> |
| SA13: To encourage employment opportunities and promote economic growth | Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from this site it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw material for glass | <p>+</p> | <p>0</p> <p>No effect post restoration</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|-------------------|--|--------------------------------|-------------------------------|
| | <p>manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits.</p> | | |
| Conclusion | <p>The site scores well in terms of proximity to the existing processing plant at Leziate and is located in an area of low flood risk. There are potential negative effects on the historic environment and biodiversity. It is considered that these effects could be appropriately mitigated. There would be adverse impacts on the County Wildlife Site located within the site, but potential positive effects on restoration. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture.</p> | | |

Area of Search A – Land west of Snettisham

Size of Area of Search: 328 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The southern extent of the AoS is approximately 20 km from the Leziate processing plant. It is likely that any extraction site would transfer mineral to the processing plant by road. | -- Mineral extraction requires energy and therefore emits CO ₂ . There would also be CO ₂ emissions from road transportation to the processing plant. | 0 No contributions to climate change post extraction. Due to the landscape of AOS A, restoration is unlikely to include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS would lead to increased road transport to the processing plant. This would have a negative effect on air quality due to vehicle emissions. | -- Due to increased road transport of silica sand. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the area of search boundary. The settlements of Snettisham, Ingoldisthorpe, Dersingham and Shepherd's Port are approximately 250 metres from the area of search boundary. | 0 It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. Silica sand extraction is not expected to cause vibration. This is a large area of search and the visual intrusion of a mineral extraction site would depend on where it is located within the AoS. It may be possible to locate a site further away from all residential properties and ensure that it is appropriately screened to mitigate visual intrusion. | 0 No effect post restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social | Mineral extraction sites are unlikely to provide improved accessibility to | 0 No effects expected during extraction. | ? As this is an area of search, it is unknown whether enhanced |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|--|--|
| exclusion | services and facilities and reduce social exclusion. The effect on employment is assessed under objective SA13. | | public access would be provided on restoration. |
| SA5: To maintain and enhance the character of the townscape and historic environment | The following listed buildings are located between 250 and 500 metres from the area of search: Barn 25 metres to west of Ingoldisthorpe, Old Hall Farm House, Garden Walls to Old Hall Farm House. There are 22 listed buildings within 2km of the AoS boundary. There are two Conservation Areas within 2km of the AoS: Snettisham 1.2km and Dersingham 810m both to the east of the site. The area contains assets of archaeological interest. | - A Heritage Statement should be included in any future planning application. It is considered that appropriate mitigation to the settings of heritage assets should be possible. Future applications should provide appropriate archaeological evaluation. Mitigation strategies may provide an opportunity to investigate heritage assets that would not otherwise take place. | - A mitigation strategy should ensure the historic value of assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <p>The western boundary of the area of search is over 1km from The Wash SSSI, SPA and Ramsar and The Wash and North Norfolk Coast SAC.</p> <p>The southern boundary of the AoS is 1.3 km from Dersingham Bog</p> | <p>- The Habitats Regulations Assessment concluded that, due to the distance of the AoS boundary to The Wash there would be no likely significant effects on the designated habitats and species of the SAC, SPA and Ramsar site from a silica sand extraction site located in AOS A.</p> <p>The AoS is outside the hydrological catchment for Dersingham Bog and</p> | <p>0 No impacts on The Wash or The Wash and North Norfolk Coast SAC are expected post restoration.</p> <p>No impacts on Dersingham Bog are expected.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|--|--|
| | <p>SAC and Ramsar site.</p> <p>The AoS is 1.74km from Snettisham Carstone Quarry SSSI.</p> <p>There is one CWS adjacent to the area of search: CWS 473 Life Wood and Ingoldisthorpe Common. CWS 474 Snettisham Common is 178 metres from the AoS and CWS 475 'Shepherd's Port Meadow is 450 metres from the AoS.</p> <p>The AoS is located within 5km of three ancient woodland sites. The closest is 1.9km from the AoS boundary.</p> <p>The Head deposits of the AoS overburden are priority geodiversity features due to their method of formation.</p> | <p>therefore no adverse impacts are expected.</p> <p>Due to distance from Snettisham Carstone Quarry no adverse impacts are expected from dust deposition and no impacts on soil pH are expected.</p> <p>This is a large area of search and the impact on CWS from a mineral extraction site would depend on where it is located within the AoS. It would be possible to locate a site away from CWS.</p> <p>The AoS is outside the hydrological catchments for all the ancient woodland sites. Due to distance no adverse impacts are expected from dust, or other ecological impacts.</p> <p>The AoS contains priority geomorphical features such as drained saltmarshes, there is also potential for sites within this area to contain other priority features such as relict shoreline and cliff features.</p> | <p>No impacts on Snettisham Carstone Quarry are expected.</p> <p>No impacts on CWS expected post restoration.</p> <p>No impacts on ancient woodland are expected.</p> <p>There would be a preference for restoration to provide opportunities for geological research of suitable exposures. However, this may not always be possible.</p> |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | This is a large AoS. The preferred restoration for an extraction site within this AoS would be lowland heathland habitat. Other possible beneficial habitats that could be created | 0 No effect during extraction phase | + There would be the greatest positive effect for biodiversity if this site is restored to lowland heathland or dry acid grassland. Other beneficial habitats for biodiversity could also |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|--|---|
| | <p>on restoration include dry acid grassland, mixed deciduous woodland, hedgerows, ponds and arable field margins, subject to these habitats also benefiting the landscape character of the area.</p> | | <p>be created</p> |
| <p>SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape</p> | <p>The area of search boundary is 179 metres from the Norfolk Coast AONB. The area of search is not within a Core River Valley or any other designated landscape feature.</p> | <p>- It is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape. Any future application within the zone of influence of the AONB will need to identify potential impacts through a Landscape and Visual Impact Assessment.</p> | <p>- Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. A restoration scheme would be likely to be most successful if it sought to return the extraction area to an open landscape. Small blocks of woodland could be successful in some parts of the AoS. Waterbodies, wet woodland, and marshland all form landscape features within the Area of Search.</p> |
| <p>SA9: To contribute to improved health and amenity of local communities in Norfolk</p> | <p>There is a public footpath along the southern edge of the AoS. A number of residential properties are within 300 metres of the AoS boundary. Caravan parks at Shepherd's Port are within 275 metres of the AoS boundary.</p> | <p>0 This is a large area of search and the potential effect of mineral extraction on health or amenity would depend on where an extraction site is located within the AoS. It would be possible to locate a site away from the footpath, all residential properties and the caravan parks.</p> | <p>+ Depending on where a mineral extraction site is located within the wider AoS, there is the potential for new public footpaths to be provided on restoration.</p> |
| <p>SA10: To protect and</p> | <p>The AoS is located</p> | <p>-</p> | <p>0/-</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|---|--|
| enhance water and soil quality in Norfolk | <p>over a principal aquifer and partially over a secondary undifferentiated aquifer; however there are no Groundwater Source Protection Zones within the AoS.</p> <p>The area of search is in largely agricultural use and is classified as grade 3. This land could potentially be Grade 3a which is classified within the Best and Most Versatile agricultural land.</p> | <p>A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts on water resources from dewatering operations undertaken to enable mineral extraction.</p> <p>Potential for BMV agricultural land to be affected by mineral extraction within the AoS.</p> | <p>Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction.</p> <p>Due to the likely depth of silica sand extraction, the land is unlikely to be restored to agriculture. Therefore there could be a permanent loss of Grade 3a agricultural land post extraction.</p> |
| SA11: To promote sustainable use of minerals resources | The southern extent of the AoS is approximately 20 km from the Leziate processing plant. | -- Due to distance from processing plant. | 0 No effect post extraction |
| SA12: To reduce the risk of current and future flooding at new and existing development | <p>Approximately 70% of AOS A has a medium to high probability of flooding from rivers and the sea within the borough council SFRA.</p> <p>The area is at risk of being affected by flooding if a breach occurs in the tidal defences. 54% of AOS A is within the Tidal Hazard extent. Within AOS A, 0.7% of the area has a high probability (greater than 1 in 30) of surface water flooding; 1.8% of the area has a medium probability (between</p> | -- The majority of AOS A has a medium or high risk of being affected by flooding from either rivers or the sea. Less than 2% of the site has a medium to high risk of being affected by surface water flooding. The Tidal Hazard extent in the event of a breach in the sea defences covers 54% of the AoS. Silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones. Silica sand | + There is potential for restoration to involve the creation of water bodies to provide flood storage capacity. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|--|--|
| | 1 in 30 and 1 in 100) of surface water flooding (between 1 in 30 and 1 in 100) and 16% of the area has a low probability (between 1 in 100 and 1 in 1,000) of surface water flooding. | extraction would be a temporary non-residential use, which exposes relatively few people to risk as only a small number of employees are required. Residual risk can be addressed through the use of a site evacuation plan. | |
| SA13: To encourage employment opportunities and promote economic growth | Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw material for glass manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits. | + | 0 No effect post restoration |
| Conclusion | This is a large area of search. There are potential negative effects on biodiversity, landscape and the historic environment. It is considered that these effects could be appropriately mitigated. There are negative effects due to the distance from the existing processing plant at Leziate, compared to some of the other areas of search. The AOS scored negatively for flood risk because the majority of the area is at medium to high risk of flooding from rivers and the sea and over half of AOS A is a risk of flooding if a breach occurs in the tidal defences. There is the potential for a permanent loss of Grade 3a agricultural land, depending on where mineral extraction is located within the area of search. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture. | | |

Area of Search B – land south of Heacham

Size of Area of Search: 240 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment Post Extraction |
|---|--|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The southern extent of the area of search is approximately 24km from the Leziat processing plant. It is likely that any extraction site would transfer mineral to the processing plant by road. | -- Mineral extraction requires energy and therefore emits CO ₂ . There would also be CO ₂ emissions from road transportation to the processing plant. | 0 No contributions to climate change post extraction. Due to the landscape of AOS B, restoration is unlikely to include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS would lead to increased road transport to the processing plant. This would have a negative effect on air quality due to vehicle emissions. | -- Due to increased road transport of silica sand. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the area of search boundary. The settlements of Heacham and Shepherd's Port are 250 metres from the AoS boundary. There are caravan parks at Shepherd's Port less than 250 metres from the AoS boundary. | -- It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. However, there are caravan parks less than 250 metres from the AoS boundary. Silica sand extraction is not expected to cause vibration. Whilst this is a large AoS, due to the raised nature of the area surrounding the AoS it would not be possible for extraction to take place without significant impacts in terms of visual intrusion, and that mitigation measures such as screening | 0 No effect post restoration |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment Post Extraction |
|--|--|--|--|
| | | and/or bunding are likely to be intrusive in themselves due to the topography of the AoS and the surrounding area. | |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. The effect on employment is assessed under objective SA13. | 0 No effects expected during extraction. | ? As this is an area of search, it is unknown whether enhanced public access would be provided on restoration. |
| SA5: To maintain and enhance the character of the townscape and historic environment | The closest listed building to the AoS boundary is Lodge Hill Farmhouse which is 517 metres away. There are eleven listed buildings within 2km of the AoS. There is a Scheduled Monument (remains of tower on Lodge Hill) 387 metres from the AoS boundary. There are two Conservation Areas within 2km of the AoS: Snettisham 812m and Dersingham 732m both to the east of the site. The area contains assets of archaeological interest, including existing earthworks which should be retained in-situ. | -- Whilst this is a large AoS, due to the raised nature of the area surrounding the AoS it would not be possible for extraction to take place without significant impacts in terms of visual intrusion, and mitigation measures such as screening and/or bunding are likely to be intrusive in themselves due to the topography of the AoS and the surrounding area. As the area contains archaeological assets, some of which should be retained in-situ, these and their settings will reduce the potential area suitable for extraction. | - The extraction would be likely to create water bodies in this landscape, which would change the landscape. However, there is the potential that if well engineered this could represent a recreation of an earlier landscape which would provide aesthetic value. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | The western boundary of the AoS is 250 metres from The Wash SSSI, SPA and Ramsar and The Wash and | -- Due to the proximity of the AoS boundary to The Wash, there could be significant effects on the designated features | - No impacts on The Wash or The Wash and North Norfolk Coast SAC are expected post restoration. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment Post Extraction |
|--------------|--|---|--|
| | <p>North Norfolk Coast SAC.</p> <p>The southern boundary of the AoS is 4.35km from Dersingham Bog SSSI</p> <p>The AoS is 1.1km from Snettisham Carstone Quarry.</p> <p>The following County Wildlife Sites are within the boundary of the area of search: CWSs 477 'Coast near Snettisham' and CWS 478 'Snettisham Grazing Marshes'.</p> <p>There is an ancient woodland site, which is a PAWS, 355m from the area of search boundary.</p> | <p>The Wash (bird species) due to disturbance and potential loss of functional habitat for birds. There are not likely to be significant effects on the designated habitats of The Wash itself.</p> <p>The AoS is outside the hydrological catchment for Dersingham Bog and therefore no likely significant effects are expected.</p> <p>Due to distance from Snettisham Carstone Quarry no adverse impacts are expected from dust deposition and no impacts on soil pH are expected.</p> <p>This is a large area of search, however, the majority of the AoS consists of the County Wildlife Sites, therefore extraction within the AoS is likely to adversely affect these CWSs.</p> <p>The AoS is within the hydrological catchment for the ancient woodland. This is a large AoS and the impact of a mineral extraction site would depend on where it is located within the AoS. The majority of the AoS drains away from the ancient woodland and would not have an adverse hydrological</p> | <p>No impacts on Dersingham Bog are expected.</p> <p>No impacts on Snettisham Carstone Quarry are expected.</p> <p>A well –designed and managed restoration scheme could have a positive effect on biodiversity. However, it is unlikely that a restoration scheme could reciprocate the existing semi-natural appearance of the AoS.</p> <p>No impacts on ancient woodland are expected post restoration.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment Post Extraction |
|---|--|---|--|
| | <p>The AoS contains priority geomorphical features such as drained saltmarshes. Lodge and Ken Hill to the east of the AoS is a prominent escarped hill geomorphical feature.</p> | <p>impact. Due to distance no other adverse impacts are expected.</p> <p>There is the potential for sites within this area to contain other priority features.</p> | <p>There would be a preference for restoration to provide opportunities for geological research of suitable exposures. However, this may not always be possible.</p> |
| <p>SA7: To promote innovative solutions for the restoration and after use of minerals sites</p> | <p>The preferred restoration for a mineral extraction site within this AoS would be to a mosaic of reed bed, grazing marsh and lagoons.</p> | <p>0 No effect during extraction phase</p> | <p>0 A well –designed and managed restoration scheme of a mosaic of reed bed, grazing marsh and lagoons could have a positive effect on biodiversity. However, it is unlikely that a restoration scheme could reciprocate the existing semi-natural appearance of the AoS.</p> |
| <p>SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape</p> | <p>The area of search is adjacent to the Norfolk Coast AONB. The western edge of the area of search is within a Core River Valley. Core Strategy Policy DM2 requires mineral extraction to provide enhancement within a Core River Valley.</p> | <p>-- The shape of the Area of Search and the elevated viewpoints from which it can be seen, mean that extraction is likely to be visually intrusive and that mitigation measures are also likely to be visually intrusive in its own right. There are significant risks that the extraction would be visually intrusive within the AONB.</p> | <p>- The extraction would be likely to create water bodies in this landscape, which would change the landscape. However, there is the potential that if well engineered this could represent a recreation of an earlier landscape which would provide aesthetic value. However, it is likely to be difficult to prove an enhancement to the Core River Valley.</p> |
| <p>SA9: To contribute to improved health and amenity of local</p> | <p>There is a public footpath along the western edge of the</p> | <p>0 This is a large area of search and the</p> | <p>+ Depending on where a mineral extraction</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment Post Extraction |
|---|--|--|---|
| communities in Norfolk | AoS, and a footpath running east-west across the centre of the AoS. A large number of residential properties are within 300 metres of the AoS boundary. Caravan parks at Shepherd's Port are within 300 metres of the AoS boundary. | potential effect of mineral extraction on health or amenity would depend on where an extraction site is located within the AoS. It may be possible to locate a site away from the footpaths, all residential properties and the caravan parks. | site is located within the wider AoS, there is the potential for new public footpaths to be provided on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | <p>The AoS is located over a principal aquifer and partially over a secondary undifferentiated aquifer; however there are no Groundwater Source Protection Zones within the AoS.</p> <p>The area of search is in largely agricultural use and is classified as grades 4 and 3. This land could potentially be Grade 3a which is classified within the Best and Most Versatile agricultural land.</p> | <p>-</p> <p>A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts on water resources from dewatering operations undertaken to enable mineral extraction.</p> <p>Potential for BMV agricultural land to be affected by mineral extraction within the AoS.</p> | <p>0/-</p> <p>Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction.</p> <p>Due to the likely depth of silica sand extraction, the land is unlikely to be restored to agriculture. Therefore there could be a permanent loss of Grade 3a agricultural land post extraction, depending on the location of extraction.</p> |
| SA11: To promote sustainable use of minerals resources | The southern extent of the area of search is approximately 24 kilometres from the Leziate processing plant. | -- Due to distance from processing plant. | 0 No effect post extraction |
| SA12: To reduce the risk of current and future flooding at new and existing development | Approximately 79% of AOS B has a medium or high probability of flooding from rivers and the sea within the borough council SFRA. | -- The majority of AOS B has a medium or high risk of being affected by flooding from either rivers or the sea. Less than 1% of the site has a | + There is potential for restoration to involve the creation of water bodies to provide flood storage capacity. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment Post Extraction |
|--|--|---|--|
| | <p>The area is at risk of being affected by flooding if a breach occurs in the tidal defences. 78% of AOS B is within the Tidal Hazard extent. Within AoS B, 0.23% of the area has a high probability (greater than 1 in 30) of surface water flooding; 0.64% of the area has a medium probability (between 1 in 30 and 1 in 100) of surface water flooding, and 22.65% of the area has a low probability (between 1 in 100 and 1 in 1,000) of surface water flooding. The area is at risk of being affected by flooding if a breach occurs in the tidal defences.</p> | <p>medium to high risk of being affected by surface water flooding. The Tidal Hazard extent in the event of a breach in the sea defences covers 78% of the AoS. Silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones. Silica sand extraction would be a temporary non-residential use, which exposes relatively few people to risk as only a small number of employees are required. Residual risk can be addressed through the use of a site evacuation plan.</p> | |
| <p>SA13: To encourage employment opportunities and promote economic growth</p> | <p>Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw material for glass manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits.</p> | <p>+</p> | <p>0 No effect post restoration</p> |
| <p>Conclusion</p> | <p>This is a large area of search. There are potentially very negative</p> | | |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment Post Extraction |
|--------------|--|-----------------------------------|-------------------------------|
| | <p>effects on amenity, the historic environment, landscape and biodiversity. It is considered that these effects would be difficult to mitigate primarily due to the open nature of the AoS, its proximity to the AONB and The Wash. There is the potential for a permanent loss of Grade 3a agricultural land, depending on where mineral extraction is located within the area of search. There are negative effects due to the distance from the existing processing plant at Leziate, compared to some of the other areas of search. The AOS scores negatively for flood risk because the majority of the area has a medium or high risk of being affected by flooding from either rivers or the sea and the majority of AOS B is a risk of flooding if a breach occurs in the tidal defences. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture.</p> | | |

Area of Search C – Land east of Hillington

Size of Area of Search: 65 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The AoS is approximately 15km from the Leziate processing plant. It is likely that any extraction site would transfer mineral to the processing plant by road. | - Mineral extraction requires energy and therefore emits CO ₂ . There would also be CO ₂ emissions from road transportation to the processing plant. | 0 No contributions to climate change post extraction. Due to the landscape of AOS C, restoration is unlikely to include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS would lead to increased road transport to the processing plant. This would have a negative effect on air quality due to vehicle emissions. | - Due to increased road transport of silica sand. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the area of search boundary. However, Gatton Waters caravan park and fishery is located adjacent to the south-east boundary of the AoS | -- It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. However, Gatton Waters caravan park is adjacent to the AoS boundary. Silica sand extraction is not expected to cause vibration. Any future planning application within the AoS will need to ensure that proposed extraction is appropriately screened to mitigate visual intrusion. | 0 No effect post restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social | Mineral extraction sites are unlikely to provide improved accessibility to | 0 No effects expected during extraction. | ? As this is an area of search, it is unknown whether enhanced |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
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| exclusion | services and facilities and reduce social exclusion. The effect on employment is assessed under objective SA13. | | public access would be provided on restoration. |
| SA5: To maintain and enhance the character of the townscape and historic environment | <p>The closest listed building to the AoS boundary is the Church of St Peter and St Paul which is 889 metres away. There are 16 listed buildings within 2km of the AoS boundary.</p> <p>The following Scheduled Monument is 335 metres from the AoS boundary: Moated site 390m south of the remains of St Mary's Church. There are seven Scheduled Monuments within 2km. There are no Conservation Areas within 2km of the boundary of the AoS. The boundary of the Registered Historic Park of Sandringham House is 710m from the AoS. The AoS contains assets of archaeological interest, including a Roman enclosure which it is recommended should remain in-situ, and may be of value as a potential scheduled monument, if investigated.</p> | <p>--</p> <p>A Heritage Statement should be included in any future planning application. It is considered that it would be difficult to design appropriate mitigation to the settings of heritage assets without it being itself intrusive, especially within the confines of the AoS shape.</p> <p>As the area contains archaeological assets, some of which should be retained in-situ, these and their settings will reduce the potential area suitable for extraction.</p> | <p>-</p> <p>The extraction would be likely to create water bodies in this landscape, however, there are already examples of small lakes within the AoS. A mitigation strategy should be able to ensure the historic value of assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts.</p> |
| SA6: To protect and enhance Norfolk's | The AoS is 1.9 km | - No likely significant | 0 No impacts on |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|--|--|
| biodiversity and geodiversity | <p>from Roydon Common SAC and Ramsar and 2.8 km from Dersingham Bog SAC and Ramsar.</p> <p>The closest County Wildlife Sites are CWS 563 Babingley Meadow (270m from the AoS) and CWS 295 River Babingley (300m from the AoS).</p> <p>The nearest ancient woodland site is Congham Wood which is a PAWS and is located 965m from the area of search boundary. 3 other ancient woodland sites are within 5km of the AoS</p> <p>The Head deposits of the AoS overburden are priority geodiversity features due to their method of formation. The Babingley River valley was modified by glacial action and west of the AoS contains geomorphical features in the form of Pingos.</p> | <p>effects are expected on Roydon Common or Dersingham Bog because the AoS is not within the hydrological catchments of these sites.</p> <p>Part of the AoS includes the valley of the Babingley River. There is the potential for hydrological impacts. Mitigation measures will be required.</p> <p>The AoS is within the hydrological catchment for all of the ancient woodland sites and upstream of three of them, Therefore there is potential for adverse hydrological impacts. Mitigation measures will be required. Due to distance, no other impacts are expected.</p> <p>There is significant potential for sites within this area to contain other examples of priority features under more recent deposits.</p> | <p>Roydon Common and Dersingham Bog are expected.</p> <p>No impacts on CWS expected post restoration.</p> <p>No impacts are expected on ancient woodland sites post extraction.</p> <p>There would be a preference for restoration to provide opportunities for further geological research of suitable exposures. However, this may not always be possible.</p> |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | The preferred restoration for a mineral extraction site within this AoS would be a mixture of heathland and dry acid grassland. | 0 No effect during extraction phase | + There could be positive effects for biodiversity if nature conservation is incorporated into a restoration scheme, |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
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| | | | preferably through the creation of heathland and dry acid grassland. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | The western boundary of the site is adjacent to the Norfolk Coast AONB. The central band of the area of search is within the Core River Valley of the Babingley River. Core Strategy Policy DM2 requires mineral extraction to provide enhancement within a Core River Valley. | -- The shape of the Area of Search and the viewpoints from which it can be seen, mean that extraction is likely to be visually intrusive and that mitigation measures are also likely to be visually intrusive in its own right. There are significant risks that the extraction would be visually intrusive within the AONB. | - The extraction would be likely to create water bodies in this landscape, which would change the landscape. However, there is the potential that if well engineered this could represent a recreation of an earlier landscape which would provide aesthetic value. However, it is likely to be difficult to prove an enhancement to the Core River Valley. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | There are no public footpaths within the AoS. The nearest residential property is 250 metres from the AoS boundary. Gatton Waters caravan park and fishery is adjacent to the south east boundary of the AoS. | - The potential effect of mineral extraction on health or amenity would depend on where an extraction site is located within the AoS. It may be possible to locate a site away from residential properties and Gatton Waters, however, due to the relatively small size of the AoS this may prove difficult in practice. | + Depending on where a mineral extraction site is located within the AoS, there is the potential for a new public footpath to be provided on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | The AoS is located over a principal aquifer and partially over a secondary undifferentiated aquifer; however there are no Groundwater Source Protection Zones within the AoS. The area of search is in largely agricultural | - A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts on water resources from dewatering operations undertaken to enable mineral extraction. | 0/- Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
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| | use and is classified as grades 3 and 4 with a small area classified as non-agricultural. The Grade 3 land could potentially be Grade 3a which is classified within the Best and Most Versatile agricultural land. | Potential for BMV agricultural land to be affected by mineral extraction within the AoS. | Due to the likely depth of silica sand extraction, the land is unlikely to be restored to agriculture. Therefore there could be a permanent loss of Grade 3a agricultural land post extraction, depending on the location of extraction. |
| SA11: To promote sustainable use of minerals resources | The area of search is approximately 15km from the Leziat processing plant. | - Due to distance from processing plant. | 0 No effect post-extraction |
| SA12: To reduce the risk of current and future flooding at new and existing development | Approximately 40% of AOS C has a medium to high probability of flooding from rivers within the borough council SFRA. Within AOS C, 0.63% of the area has a high probability (greater than 1 in 30) of surface water flooding; 2.31% of the area has a medium probability (between 1 in 30 and 1 in 100) of surface water flooding, and 11.20% of the area has a low probability (between 1 in 100 and 1 in 1,000) of surface water flooding. | - The majority of AOS C (60%) has a low risk of being affected by flooding from either rivers or the sea. Less than 2.5% of the area has a medium to high risk of being affected by surface water flooding. Silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones. Silica sand extraction would be a temporary non-residential use, which exposes relatively few people to risk as only a small number of employees are required. Residual risk can be addressed through the use of a site evacuation plan. | + There is potential for restoration to involve the creation of water bodies to provide flood storage capacity. |
| SA13: To encourage employment opportunities and promote economic growth | Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply | + | 0 No effect post restoration |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
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| | <p>the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw material for glass manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits.</p> | | |
| <p>Conclusion</p> | <p>There are potentially very negative effects on amenity, the historic environment and landscape. It is considered that these effects would be difficult to mitigate whilst still retaining a practicable area for mineral extraction within the AoS. There are potential negative effects on biodiversity and mitigation measures would be required. There are negative effects due to the distance from the existing processing plant at Leziate, compared to some of the other areas of search. There is the potential for a permanent loss of Grade 3a agricultural land, depending on where mineral extraction is located within the area of search. The majority of AOS C has a low risk of being affected by flooding from rivers, the sea or surface water. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture.</p> | | |

Area of Search D – Land in the vicinity of West Bilney Wood

Size of Area of Search: 109 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|--|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The AoS is approximately 9 km from the Leziat processing plant. It is likely that any extraction site would transfer mineral to the processing plant by road. | 0 Mineral extraction requires energy and therefore emits CO ₂ . There would also be CO ₂ emissions from road transportation to the processing plant, but only over a short distance. | + No contributions to climate change post extraction. There is the potential that restoration could include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS would lead to increased road transport to the processing plant. This would have a negative effect on air quality due to vehicle emissions. | - Due to increased road transport of silica sand. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the area of search boundary. The holiday lodges at Pentney Lakes Leisure Park, are just within 250 metres of the AoS boundary. | 0 It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. Silica sand extraction is not expected to cause vibration. Any future planning application within the AoS will need to ensure that proposed extraction is appropriately screened to mitigate visual intrusion. | 0 No effect post restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. The effect on employment is assessed under | 0 No effects expected during extraction. | ? As this is an area of search, it is unknown whether enhanced public access would be provided on restoration. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
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| | objective SA13. | | |
| SA5: To maintain and enhance the character of the townscape and historic environment | <p>The nearest listed buildings is 'Boss set into wall of farm building in garden to east of West Bilney Hall' (335 metres away). There are 11 listed buildings within 2km of the AoS boundary.</p> <p>The closest Scheduled Monument is the remains of Pentney Priory at Abbey Farm 400 metres from the AoS boundary. There are four Scheduled Monuments within 2km of the AoS boundary. There are no Registered Historic Parks and Gardens within 2km.</p> | <p>-</p> <p>A Heritage Statement should be included in any future planning application, it is considered that appropriate mitigation to the settings of heritage assets should be possible, particular care will be needed around the remains of Pentney Abbey. Future applications should provide appropriate archaeological evaluation. Mitigation strategies may provide an opportunity to investigate heritage assets that would not otherwise take place.</p> | <p>-</p> <p>A mitigation strategy should ensure, the historic value of, assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable adverse impacts.</p> |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <p>The nearest internationally designated site is Roydon Common SAC and Ramsar site, which is nearly 7km from the area of search boundary.</p> <p>The River Nar SSSI is located approximately 430 metres from the area of search boundary. East Winch Common SSSI is over 400 metres from the area of search and is water dependent.</p> | <p>-</p> <p>No impacts are expected on Roydon Common SAC and Ramsar site.</p> <p>AOS D is within the hydrological catchment of both SSSIs, but is down gradient of East Winch Common SSSI. Due to the close proximity of the AOS to these SSSIs there is the potential for adverse impacts if mineral extraction operations cause changes to the water table. Mitigation measures will</p> | <p>0</p> <p>No impacts are expected on Roydon Common SAC and Ramsar site.</p> <p>No impacts are expected post restoration.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
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| | <p>County Wildlife Site 429 South of West Bilney Warren is located within the AoS. CWS 431 Valetta Meadow is 120 metres from the AoS and CWS 532 Pentney Lakes is 160 metres from the AoS.</p> <p>The nearest ancient woodland site is a PAWS and is located over 2.7km from the area of search boundary.</p> <p>The Head deposits of the AoS overburden are geodiversity priority features due to their method of formation.</p> | <p>therefore be required.</p> <p>Extraction within the AoS could directly affect CWS 429, depending on the location of extraction within the AoS. There could be adverse effects on the adjacent CWSs, depending on the location of extraction within the AoS and if extraction causes changes in the water table. Mitigation measures will be required.</p> <p>No impacts on ancient woodland are expected.</p> <p>There is the potential for sites within this area to contain other examples of geodiversity priority features under more recent deposits.</p> | <p>If the AoS is restored to nature conservation, including mixed deciduous woodland, there could be a biodiversity enhancement, even if the existing CWS 429 is adversely affected during mineral extraction.</p> <p>No impacts on ancient woodland are expected.</p> <p>There would be a preference for restoration to provide opportunities for further geological research of suitable exposures. However, this may not always be possible.</p> |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | The preferred restoration for a mineral extraction site within this area of search would be mixed deciduous woodland on the former woodland plantation areas, and on land adjacent to woodland, with hedgerows, wide field margins and meadow areas incorporated into any restored agricultural landscape. | 0 No effect during extraction phase | + There could be positive effects for biodiversity if nature conservation is incorporated into a restoration scheme through the creation of mixed deciduous woodland and additional hedgerows, field margins and meadow areas. |
| SA8: To protect and | The southern edge of | - | - |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|--|--|
| enhance the quality and distinctiveness of the countryside and landscape | the area of search is adjacent to the Core River Valley for the River Nar. The area of search is not within any designated landscape feature. | It is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape. | Mineral extraction will result in landscape change; however, an appropriate restoration scheme should be able to ensure no unacceptable impacts in parts of the Area of Search. Restoration to agriculture or woodland would be appropriate. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | There is a public footpath within the AoS. The nearest residential property is 250 metres from the AoS boundary. The holiday lodges at Pentney Lakes leisure park is just within 250 metres of the AoS boundary. | 0 The potential effect of mineral extraction on health or amenity would depend on where an extraction site is located within the AoS. Due to the size of the AOS it may be possible to locate a site away from the footpaths, residential properties and Pentney Lakes. | + Depending on where a mineral extraction site is located within the wider AoS, there is the potential for new public footpaths to be provided on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | <p>The AoS is located over a principal aquifer and partially over secondary B and secondary undifferentiated aquifers; however there are no Groundwater Source Protection Zones within the AoS.</p> <p>The AoS is in largely forestry use and is classified as non-agricultural and grade 3 agricultural land. This land could potentially be Grade 3a which is classified within the Best and Most Versatile agricultural land.</p> | <p>- A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts on water resources from dewatering operations undertaken to enable mineral extraction.</p> <p>Potential for BMV agricultural land to be affected by mineral extraction within the AoS.</p> | <p>0/- Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction.</p> <p>Due to the likely depth of silica sand extraction, the land is unlikely to be restored to agriculture. Therefore there could be a permanent loss of Grade 3a agricultural land post extraction, depending on the location of silica sand extraction.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|--|--|
| SA11: To promote sustainable use of minerals resources | The Area of Search is approximately 9km from the Leziate processing plant. | + Due to proximity to processing plant. | 0 No effect post-extraction |
| SA12: To reduce the risk of current and future flooding at new and existing development | Approximately 18% of AOS D has a medium to high probability of flooding from rivers within the borough council SFRA. Within AOS D, 0.2% of the area has a high probability (greater than 1 in 30) of surface water flooding; 0.5% of the area has a medium probability (between 1 in 30 and 1 in 100) of surface water flooding, and 3.6% of the area has a low probability (between 1 in 100 and 1 in 1,000) of surface water flooding. | + The majority of AOS D (over 80%) has a low risk of being affected by flooding from either rivers or the sea. Less than 1% of the area has a medium to high risk of being affected by surface water flooding. Silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones. | + There is potential for restoration to involve the creation of water bodies to provide flood storage capacity. |
| SA13: To encourage employment opportunities and promote economic growth | Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw material for glass manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits. | + | 0 No effect post restoration |
| Conclusion | The AOS scores well in terms of proximity to the existing processing plant at Leziate. The majority of the area has a low risk of being | | |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--------------|---|-----------------------------------|----------------------------------|
| | <p>affected by flooding from rivers, the sea, or surface water. There are potential negative effects on the historic environment, landscape and biodiversity. It is considered that these effects could be appropriately mitigated. There could be adverse impacts on the County Wildlife Site located within the area of search, but potential positive effects on restoration. There is the potential for a permanent loss of Grade 3a agricultural land, depending on where mineral extraction is located within the area of search. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture.</p> | | |

Area of Search E – Land to the north of Shouldham

Size of Area of Search: 816 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The AoS is approximately 15km from the Leziate processing plant. It is likely that any extraction site would transfer mineral to the processing plant by road. | - Mineral extraction requires energy and therefore emits CO ₂ . There would also be CO ₂ emissions from road transportation to the processing plant. | + No contributions to climate change post extraction. There is the potential that restoration could include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS would lead to increased road transport to the processing plant. This would have a negative effect on air quality due to vehicle emissions. | - Due to increased road transport of silica sand. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the area of search boundary. The settlements of Wormegay and Shouldham are 250 metres of the AoS boundary. | 0 It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. Silica sand extraction is not expected to cause vibration. This is a large area of search and the visual intrusion of a mineral extraction site would depend on where it is located within the AoS. It may be possible to locate a site further away from all residential properties and ensure that it is appropriately screened to mitigate visual intrusion. | 0 No effect post restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities | 0 No effects expected during extraction. | ? As this is an area of search, it is unknown whether enhanced public access would |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|---|--|
| | <p>and reduce social exclusion. The effect on employment is assessed under objective SA13.</p> | | <p>be provided on restoration.</p> |
| <p>SA5: To maintain and enhance the character of the townscape and historic environment</p> | <p>The following listed buildings are approximately 250 metres from the AoS: Church of St Michael, Church of St Botolph and Castle Road Bridge. There are 18 listed buildings within 2km of the AoS Boundary</p> <p>The following two Scheduled Monuments are approximately 250 metres from the AoS: Motte and bailey castle in Wormegay Village. Shouldham Priory with associated water management features.</p> <p>There are nine Scheduled Monuments within 2km of the boundary of the AoS and three Conservation Areas.</p> | <p>-</p> <p>This is a large AOS and the impact of a mineral extraction site on the historic environment would depend on where it is located within the AoS. It may be possible to locate a site away from the listed buildings and Scheduled Monuments and ensure that it is appropriately screened to mitigate impacts on the historic environment.</p> <p>A Heritage Statement should also be included, together, with appropriate mitigation. Mitigation measures are likely to result in extraction being able to take place with no unacceptable adverse impacts. Future applications should provide appropriate archaeological evaluation. Mitigation strategies may provide an opportunity to investigate heritage assets that would not otherwise take place.</p> | <p>-</p> <p>A mitigation strategy should ensure the historic value of assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts.</p> |
| <p>SA6: To protect and enhance Norfolk's biodiversity and geodiversity</p> | <p>The nearest internationally designated site to the AoS boundary is</p> | <p>-</p> <p>No impacts on the Breckland SPA are expected.</p> | <p>0</p> <p>No impacts on the Breckland SPA are expected.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--------------|---|--|--|
| | <p>Breckland SPA at 6.3km.</p> <p>Setchey SSSI is 2.5km from the AoS boundary.</p> <p>The River Nar SSSI is 250 metres from the AOS boundary.</p> <p>CWS 425 Mow Fen is within the area of search. CWS 424 Westbrigg's Woods and CWS 373 Adjacent Adams plantation are adjacent to the area of search.</p> <p>The nearest ancient woodland site is Bowl Wood which is an ancient and semi-natural woodland; it is 1.35 km from the area of search boundary.</p> <p>The Head deposits of the AoS overburden are geodiversity priority features due</p> | <p>Part of the AoS is within the hydrological catchment of Setchey SSSI, but the AoS does not drain towards Setchey SSSI. Therefore no likely adverse impacts on Setchey SSSI.</p> <p>However, due to the land within AOS E being artificially drained to multiple outlets, none of the land in the AoS drains to the River Nar. Therefore no likely adverse impacts on the River Nar SSSI.</p> <p>This is a large AoS, therefore the effect on the CWS from mineral extraction would depend on the location of the mineral extraction within the AOS. It would be possible to locate extraction away from the CWSs.</p> <p>The AoS is within the hydrological catchment for Bowl Wood. There is therefore the potential for hydrological impacts. Mitigation measures may be required. Due to distance no other impacts are expected.</p> <p>There is the potential for sites within this area to contain other examples of</p> | <p>No impacts on Setchey SSSI are expected post extraction.</p> <p>No impacts on River Nar SSSI are expected post extraction.</p> <p>No impacts on County Wildlife Sites expected post restoration.</p> <p>No impacts on ancient woodland post extraction.</p> <p>There would be a preference for restoration to provide opportunities for</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|---|--|
| | to their method of formation. The AoS contains geodiversity priority features in the form of paleo-environmental deposits, and Setchey SSSI, north of the site, is designated for its geological features. | geodiversity priority features. | further geological research of suitable exposures. However, this may not always be possible. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | Restoration should reflect the existing landscape of agricultural land, woodland and fen, with increased areas of those habitats created next to the existing wooded and fen areas. There should be no net loss of woodland or Fen habitat, and additional habitat should be sought. | 0 No effect during extraction phase | + There could be positive effects for ecology if restoration is to mixed deciduous woodland, wet woodland and fen. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | The north-western boundary of the area of search is adjacent to the Core River Valley for the River Nar. The area of search is not within any designated landscape feature. | - It is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape. | - Mineral extraction will result in landscape change; however, an appropriate restoration scheme should be able to ensure no unacceptable impacts in parts of the Area of Search. A restoration combination of woodland and wetland would be suitable for restoration, however this will depend on the location within the AoS as landscape character differs across the area. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | There are public footpaths within the AoS. There are a large number of residential properties | 0 This is a large area of search and the potential effect of mineral extraction on | + Depending on where a mineral extraction site is located within the wider AoS, there |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|--|--|
| | within 300 metres of the AoS boundary. | health or amenity would depend on where an extraction site is located within the AoS. It may be possible to locate a site away from the footpaths, all residential properties. | is the potential for new public footpaths to be provided on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | <p>The AoS is located over a principal aquifer and partially over secondary B and secondary undifferentiated aquifers; however there are no Groundwater Source Protection Zones within the area of search</p> <p>The area of search is a mixture of forestry and agriculture. The agricultural land is grades 4 and 3. This land could potentially be Grade 3a which is classified within the Best and Most Versatile agricultural land.</p> | <p>-</p> <p>A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts on water resources from dewatering operations undertaken to enable mineral extraction.</p> <p>Potential for BMV agricultural land to be affected by mineral extraction within the AoS.</p> | <p>0/-</p> <p>Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction.</p> <p>Due to the depth of silica sand extraction, the land is unlikely to be restored to agriculture. Therefore there could be a permanent loss of Grade 3a agricultural land post extraction, depending on the location of silica sand extraction.</p> |
| SA11: To promote sustainable use of minerals resources | The Area of Search is approximately 15km from the Leziat processing plant. | <p>-</p> <p>Due to distance from processing plant.</p> | <p>0</p> <p>No effect post-extraction</p> |
| SA12: To reduce the risk of current and future flooding at new and existing development | Approximately 52% of AOS E has a medium to high probability of flooding from rivers within the borough council SFRA. Within AOS E, 0.5% of the area has a high probability (greater than 1 in 30) of surface water flooding; 1.5% of the area has a medium | <p>-</p> <p>48% of AOS E has a low risk of being affected by flooding from either rivers or the sea. Less than 1.5% of the area has a medium to high risk of being affected by surface water flooding. Silica sand extraction is considered to be a 'water compatible'</p> | <p>+</p> <p>There is potential for restoration to involve the creation of water bodies to provide flood storage capacity.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|--|--|
| | <p>probability (between 1 in 30 and 1 in 100) of surface water flooding and 6.9% of the area has a low probability (between 1 in 100 and 1 in 1,000) of surface water flooding.</p> | <p>land use which is suitable in all flood zones. Silica sand extraction would be a temporary non-residential use, which exposes relatively few people to risk as only a small number of employees are required. Residual risk can be addressed through the use of a site evacuation plan.</p> | |
| <p>SA13: To encourage employment opportunities and promote economic growth</p> | <p>Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw material for glass manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits.</p> | <p>+</p> | <p>0 No effect post restoration</p> |
| <p>Conclusion</p> | <p>This is a large area of search. There are potential negative effects on the historic environment and landscape. It is considered that these effects could be appropriately mitigated. There are potentially negative effects on a County Wildlife Site located within AOS E, depending on where mineral extraction is located. These effects would need to be mitigated. There are negative effects due to the distance from the existing processing plant at Leziate, compared to some of the other areas of search. The AoS scored negatively for flood risk because over half of AOS E is at medium to high risk of flooding from either rivers, the sea or surface water. There is the potential for a permanent loss of Grade 3a agricultural land, depending on where mineral extraction is located within AOS E. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture.</p> | | |

Area of Search F – land to the north of Stow Bardolph

Size of Area of Search: 61 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|--|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The AoS is approximately 17km from the Leziate processing plant. It is likely that any extraction site would transfer mineral to the processing site by road. | - Mineral extraction requires energy and therefore emits CO ₂ . There would also be CO ₂ emissions from road transportation to the processing plant. | + No contributions to climate change post extraction. There is the potential that restoration could include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS would lead to increased road transport to the processing plant. This would have a negative effect on air quality due to vehicle emissions. | - Due to increased road transport of silica sand. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the area of search boundary. Stow Bardolph is 250m away and South Runcton is less than 400m from the AoS boundary. | 0 It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. Silica sand extraction is not expected to cause vibration. Any future planning application within the AoS will need to ensure that proposed extraction is appropriately screened to mitigate visual intrusion. | 0 Any future planning application within the AoS would be expected to have no adverse visual impact on restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. The effect on employment is assessed under objective SA13. | 0 No effects expected during extraction. | ? As this is an area of search, it is unknown whether enhanced public access would be provided on restoration. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|--|--|
| SA5: To maintain and enhance the character of the townscape and historic environment | <p>The closest listed building is approximately 250 metres from the AoS: North Lodge to Stow Hall. There are 13 listed buildings within 2km of the AoS boundary.</p> <p>There are two Conservation Areas, Wimbotsham and Shouldham Thorpe; and one Registered Historic Park and Garden: Stradsett Hall within 2km of the AoS. There are no Scheduled Monuments within 2km of the boundary. The AoS is adjacent to the unregistered remnants of Stow Hall and the wider setting of Wallington Hall.</p> | <p>-</p> <p>A future application should provide appropriate archaeological evaluation, which may provide an opportunity to investigate heritage assets that would not otherwise take place. A Heritage Statement should also be included, together, with appropriate mitigation. It is considered that mitigation measures are likely to result in extraction being able to take place with no unacceptable adverse impacts.</p> | <p>-</p> <p>A mitigation strategy should ensure the historic value of assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts.</p> |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <p>The nearest internationally designated site is the Ouse Washes SAC which is over 6.2km from the AoS boundary.</p> <p>Setchey SSSI is 4.7km from the AoS boundary.</p> <p>CWS 361 'north east of Wallington Hall' is 293m from the AoS, CWS 365 'Broad Meadow Plantation' is adjacent to the AoS and CWS 357 'Chiswick's Wood' is 830m from the AoS.</p> | <p>-</p> <p>No impacts on the Ouse Washes are expected.</p> <p>Due to distance, no impacts on SSSIs are expected.</p> <p>There is the potential for adverse hydrological impacts on CWS 361 and mitigation measures will be required to ensure no adverse impacts on the CWSs in proximity to the AoS.</p> | <p>0</p> <p>No impacts on the Ouse Washes are expected.</p> <p>Due to distance, no impacts on SSSIs are expected.</p> <p>No adverse impacts are expected on these CWS post restoration.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|---|---|
| | <p>Three ancient replanted woodlands are between 500 to 1,000 metres from the area of search boundary.</p> <p>The AoS has overburden made up of Till deposits partially overlying the Lower Cretaceous Leziate Beds.</p> | <p>AOS F is within the hydrological catchment for these ancient woodlands, however, the AoS drains away from the ancient woodland sites and therefore adverse hydrological impacts are unlikely. Due to the distance of the AoS from the ancient woodland sites other adverse impacts are also unlikely.</p> <p>There is the potential for sites within this area to contain other examples of geodiversity priority features under more recent deposits.</p> | <p>No adverse impacts are expected on ancient woodland sites post restoration.</p> <p>There would be a preference for restoration to provide opportunities for further geological research of suitable exposures. However, this may not always be possible.</p> |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | The preferred restoration for ecology would be a combination of agricultural land with mixed species hedgerows, wide field margins, ponds and mixed deciduous woodland. There should be no net loss of woodland and areas of planting should adjoin existing areas to extend the size. | 0 No effect during extraction phase | + There would be a positive effect on ecology if restoration includes priority habitats of hedgerows, ponds and lowland mixed deciduous woodland. The AoS is adjacent to the remnants of Stow Hall parkland and the wider setting of Wallington Hall and restoration would also need to be in keeping with these areas. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | The area of search is not within a Core River Valley, or any designated landscape feature. Adjacent to the area of search are undesignated remnants of parkland which make a | - It is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape. | - Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. There are examples of woodland blocks, |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|---|--|
| | significant landscape contribution. | | wet woodland and waterbodies in the zone of influence of the area of search, which should all be possible on restoration. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | There are no public footpaths within the AoS. There are some residential properties 250 metres from the AoS boundary. | 0 There is unlikely to be a significant impact on health or amenity from mineral extraction within the AoS. | 0 It is unlikely that there would be new public footpaths provided within the AoS on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | The AoS is located over a principal aquifer and partially over a secondary undifferentiated aquifer; however there are no Groundwater Source Protection Zones in the AoS. The area of search is a mixture of forestry and agricultural uses with the agricultural land in grades 4 and 3. This land could potentially be Grade 3a which is classified within the Best and Most Versatile agricultural land. | - A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts on water resources from dewatering operations undertaken to enable mineral extraction. Potential for BMV agricultural land to be affected by mineral extraction within the AoS. | 0/- Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction. Due to the likely depth of silica sand extraction, the land is unlikely to be restored to agriculture. Therefore there could be a permanent loss of Grade 3a agricultural land post extraction, depending on the location of silica sand extraction. |
| SA11: To promote sustainable use of minerals resources | The Area of Search is approximately 17km from the Leziate processing plant. | - Due to distance from processing plant. | 0 No effect post-extraction |
| SA12: To reduce the risk of current and future flooding at new and existing development | AoS F has a low probability of flooding from rivers within the borough council SFRA. Within AOS F, 0.3% of the area has a high probability (greater than 1 in 30) | + AOS F has a low risk of being affected by flooding from either rivers or the sea. Less than 1% of the area has a medium to high risk of being | + There is potential for restoration to involve the creation of water bodies to provide flood storage capacity. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|--|---------------------------------|
| | of surface water flooding; 0.5% of the area has a medium probability (between 1 in 30 and 1 in 100) of surface water flooding, and 3.7% of the area has a low probability (between 1 in 100 and 1 in 1000) of surface water flooding. | affected by surface water flooding. Silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones. | |
| SA13: To encourage employment opportunities and promote economic growth | Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw material for glass manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits. | + | 0 No effect post restoration |
| Conclusion | There are potentially negative effects on the historic environment, landscape and biodiversity. It is considered that these effects could be appropriately mitigated. There are negative effects due to the distance from the existing processing plant at Leziate, compared to some of the other areas of search. The site has a low risk of being affected by flooding. There is the potential for a permanent loss of Grade 3a agricultural land, depending on where mineral extraction is located within the area of search. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture. | | |

Area of Search G – Land at Mintlyn Wood

Size of Area of Search: 33.5 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|--|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The area of search is approximately 1.5 km from the Leziat processing plant. It is likely that any extraction site would transfer mineral to the processing plant by conveyor. | ++ Mineral extraction requires energy and therefore emits CO ₂ . However, there would not be CO ₂ emissions from road transportation to the processing plant. | 0 No contributions to climate change post extraction. Restoration is unlikely to include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS should not lead to increased road transport due to its proximity to the processing plant. | 0 There should not be any adverse air quality impacts because the mineral will not need to be transported by road. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the area of search boundary. | 0 It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. Silica sand extraction is not expected to cause vibration. Any future planning application within the AoS will need to ensure that proposed extraction is appropriately screened to mitigate visual intrusion. | 0 No effect post restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. The effect on employment is assessed under objective SA13. | 0 No effects expected during extraction. | 0 It is unlikely that enhanced public access would be provided within the area of search on restoration. |
| SA5: To maintain and enhance the character | The two closest listed buildings are | - A future application | - A mitigation strategy |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|--|---|
| of the townscape and historic environment | 250 metres from the site: the font against south façade of Whitehouse Farmhouse, and the ruins of Church of St Michael. There are 13 listed buildings within 2km of the AoS boundary. There are three Scheduled Monuments, but no Conservation Areas or Historic Parks and Gardens within 2km of the AoS. The AoS contains assets of archaeological interest. | should provide appropriate archaeological evaluation, which may provide an opportunity to investigate heritage assets that would not otherwise take place. A Heritage Statement should also be included, together, with appropriate mitigation. It is considered that mitigation measures are likely to result in extraction being able to take place with no unacceptable adverse impacts. | should ensure, the historic value of, assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <p>Roydon Common SSSI, SAC and Ramsar site is located 2.4km from the AoS boundary.</p> <p>The AoS is located less than 3km from Leziate, Sugar and Derby Fens SSSI.</p> <p>There is a County Wildlife Site, 418 Haverlesse Manor Plantation, located within the area of search. CWS 416 '70 & 100 Plantations' is located 345 metres from the area of search.</p> <p>The nearest ancient woodland site is Reffley Wood, a</p> | <p>-</p> <p>No likely significant effects are expected on Roydon Common because the AoS is not within the hydrological catchment of Roydon Common.</p> <p>No adverse impacts are expected because the AoS is outside the hydrological catchment and down gradient of this SSSI.</p> <p>Mineral extraction on the AoS would adversely affect CWS 418. Mitigation measures will therefore be required.</p> <p>No impacts on ancient woodland are expected.</p> | <p>0</p> <p>No likely significant effects on Roydon Common post extraction.</p> <p>No adverse impacts on SSSIs post extraction.</p> <p>If the AoS is restored to nature conservation, there could be a biodiversity enhancement, even if the existing CWS 418 is adversely affected during mineral extraction.</p> <p>No impacts on ancient woodland are expected.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|---|--|
| | <p>PAWS which is 1.4km from the AoS boundary.</p> <p>The AoS is in the vicinity of the Bawsey SSSI which is designated for geological features, and similar deposits occur in the most southern part of the AoS and may have research potential, if exposed.</p> | <p>There is the potential for sites within this area to contain other examples of geodiversity priority features.</p> | <p>There would be a preference for restoration to provide opportunities for further geological research of suitable exposures. However, this may not always be possible.</p> |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | The preferred restoration for this AoS would be lowland heathland and acid grassland which would provide a net biodiversity gain. | 0 No effect during extraction phase | + There would be a positive effect for biodiversity if the AoS is restored to lowland heathland and dry acid grassland. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | The area of search is not within a Core River Valley, or other designated landscape feature. The Area of Search includes some areas which have been partially worked for silica sand in the past. | 0 It is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape. | 0 Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. A restoration scheme could incorporate waterbodies, woodland, or heathland, which all form landscape features within the Area of Search. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | There are no public footpaths within the AoS. The nearest residential property is 250 metres from the AoS boundary. | 0 There is unlikely to be a significant impact on health or amenity from mineral extraction within the AoS. | 0 It is unlikely that there would be new public footpaths provided within the AoS on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | The AoS is located over a principal aquifer and partially over a secondary undifferentiated aquifer, but it mainly | 0 A Hydrological Risk Assessment will be required as part of any planning application within this | 0 Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|--|---|
| | <p>overlays an unproductive secondary aquifer. However, there are no Groundwater Source Protection Zones in the AoS.</p> <p>The area of search is split between non-agricultural and grade 4 agricultural land.</p> | <p>AoS to ensure no unacceptable impacts on water resources from dewatering operations undertaken to enable mineral extraction</p> <p>No impacts on BMV agricultural soils.</p> | <p>extraction.</p> <p>No impacts on BMV agricultural soils.</p> |
| SA11: To promote sustainable use of minerals resources | The area of search is approximately 1.5 kilometres from the Leziate processing plant. | <p>++ Due to proximity to processing plant.</p> | <p>0 No effect post-extraction</p> |
| SA12: To reduce the risk of current and future flooding at new and existing development | AOS G has a low probability of flooding from rivers within the borough council SFRA. Within AoS G, none of the area has a high probability of being affected by surface water flooding; 0.04% of the area has a medium probability (between 1 in 30 and 1 in 100) of surface water flooding, and 0.82% of the area has a low probability (between 1 in 100 and 1 in 1,000) of surface water flooding. | <p>++ AOS G has a low risk of being affected by flooding from either rivers or the sea. Less than 1% of the area has a risk of being affected by surface water flooding. Silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones.</p> | <p>+ There is potential for restoration to involve the creation of water bodies to provide flood storage capacity.</p> |
| SA13: To encourage employment opportunities and promote economic growth | Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The | <p>+</p> | <p>0 No effect post restoration</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--------------------------|--|--------------------------------|-------------------------------|
| | <p>processed silica sand is then a raw material for glass manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits.</p> | | |
| <p>Conclusion</p> | <p>The Area of Search scores well in terms of proximity to the existing processing plant at Leziate. The site has a low risk of being affected by flooding. There are potential negative effects on the historic environment and biodiversity. It is considered that these effects could be appropriately mitigated. There would be adverse impacts on the County Wildlife Site located within the AoS, but potential positive effects on restoration. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture.</p> | | |

Area of Search H – Land west of 70 Acre Plantation

Size of Area of Search: 29 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|--|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The area of search is approximately 600 metres from the Leziate processing plant. It is likely that any extraction site would transfer mineral to the processing plant by conveyor. | ++ Mineral extraction requires energy and therefore emits CO ₂ . However, there would not be CO ₂ emissions from road transportation to the processing plant. | 0 No contributions to climate change post extraction. Restoration is unlikely to include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS should not lead to increased road transport due to its proximity to the processing plant. | 0 There should not be any adverse air quality impacts because the mineral will not need to be transported by road. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the area of search boundary. Leziate is less than 500m from the AoS boundary. | 0 It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. Silica sand extraction is not expected to cause vibration. Any future planning application within the AoS will need to ensure that proposed extraction is appropriately screened to mitigate visual intrusion. | 0 No effect post restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. The effect on employment is assessed under objective SA13. | 0 No effects expected during extraction. | 0 It is unlikely that enhanced public access would be provided within the area of search on restoration. |
| SA5: To maintain and | The closest listed | - | - |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|---|---|
| enhance the character of the townscape and historic environment | building is 250 metres from the AoS: the front against south façade of Whitehouse Farmhouse. There are 13 listed buildings within 2km of the AoS boundary. There are three Scheduled Monuments, but no Conservation Areas or Historic Parks and Gardens within 2km of the AoS. The AoS contains assets of archaeological interest. | A future application should provide appropriate archaeological evaluation, which may provide an opportunity to investigate heritage assets that would not otherwise take place. A Heritage Statement should also be included, together, with appropriate mitigation. It is considered that mitigation measures are likely to result in extraction being able to take place with no unacceptable adverse impacts. | A mitigation strategy should ensure that, the historic value of, the assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <p>Roydon Common SSSI, SAC and Ramsar site is located 2.75km from the AoS boundary.</p> <p>The AoS is located less than 3km from Leziate, Sugar and Derby Fens SSSI.</p> <p>The following County Wildlife Sites are within the AoS: CWS 416 '7 & 100 Acre Plantations and CWS 422 The Holt. CWS 418 Haverlesse Manor Plantations is adjacent to the area of search.</p> | <p>- No likely significant effects are expected on Roydon Common because the AoS is not within the hydrological catchment of Roydon Common.</p> <p>No adverse impacts are expected because the AoS is outside the hydrological catchment and down gradient of this SSSI.</p> <p>Mineral extraction on the site would adversely affect CWS 416 and 422. Adjacent CWS416 could also be adversely affected due to proximity. Mitigation measures will therefore be</p> | <p>0 No likely significant effects on Roydon Common post extraction.</p> <p>No adverse impacts on SSSIs post extraction.</p> <p>If the site is restored to nature conservation, there could be a biodiversity enhancement, even if the existing CWS 416 and 422 are adversely affected during mineral extraction. Restoration could also</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|--|---|
| | <p>The nearest ancient woodland site is Reffley Wood, a PAWS which is over 2km from the AoS.</p> <p>The Head deposits of the AoS overburden are priority geodiversity features due to their method of formation. The AoS is close to Bawsey SSSI, designated for geological features. Similar deposits occur in the most southern part of the AoS and may have research potential, if exposed.</p> | <p>required.</p> <p>No impacts on ancient woodland are expected.</p> <p>There is the potential for sites within this area to contain other examples of geodiversity priority features.</p> | <p>benefit the adjacent CWS if additional conservation habitat is created.</p> <p>No impacts on ancient woodland are expected.</p> <p>There would be a preference for restoration to provide opportunities for further geological research of suitable exposures. However, this may not always be possible.</p> |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | The preferred restoration for this AoS would be lowland heathland and acid grassland which would provide a net biodiversity gain. | 0 No effect during extraction phase | + There would be a positive effect for biodiversity if the AoS is restored to lowland heathland and dry acid grassland. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | The area of search is not within a Core River Valley, or other designated landscape feature. The Area of Search includes some areas which have been partially worked for silica sand in the past. | 0 It is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape. | 0 Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. A restoration scheme could incorporate waterbodies, woodland and heathland which all form landscape features within the AoS. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|--|---|
| SA9: To contribute to improved health and amenity of local communities in Norfolk | There are no public footpaths within the AoS. The nearest residential property is 250 metres from the AoS boundary. | 0 There is unlikely to be a significant impact on health or amenity from mineral extraction within the AoS. | 0 It is unlikely that there would be new public footpaths provided within the AoS on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | The AoS is located over a principal aquifer and partially over a secondary undifferentiated aquifer, but it mainly overlays an unproductive secondary aquifer. However, there are no Groundwater Source Protection Zones in the AoS. The AoS is classified as being in 'Non-Agricultural' use. | 0 A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts on water resources from dewatering operations undertaken to enable mineral extraction. No impacts on BMV agricultural soils. | 0 Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction. No impacts on BMV agricultural soils. |
| SA11: To promote sustainable use of minerals resources | The area of search is approximately 600 metres from the Leziate processing plant. | ++ Due to proximity to processing plant. | 0 No effect post-extraction |
| SA12: To reduce the risk of current and future flooding at new and existing development | AOS H has a low probability of flooding from rivers within the borough council SFRA. Within AOS H, 0.05% of the area has a high probability (greater than 1 in 30) of surface water flooding, 0.07% of the area has a medium probability (between 1 in 30 and 1 in 100) of surface water flooding, and 0.86% of the area has a low probability (between 1 in 100 and 1 in 1,000) of surface water flooding. | ++ AOS H has a low risk of being affected by flooding from either rivers or the sea. Less than 1% of the area has a risk of being affected by surface water flooding. Silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones. | + There is potential for restoration to involve the creation of water bodies to provide flood storage capacity. |
| SA13: To encourage employment | Although employment levels at | + | 0 No effect post |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|--------------------------------|-------------------------------|
| opportunities and promote economic growth | minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw material for glass manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits. | | restoration |
| Conclusion | The AoS scores well in terms of proximity to the existing processing plant at Leziate. The site has a low risk of being affected by flooding. There are potential negative effects on the historic environment and biodiversity. It is considered that these effects could be appropriately mitigated. There would be adverse impacts on the County Wildlife Sites located within the AoS, but potential positive effects on restoration. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture. | | |

Area of Search I – Land to the east of South Runcton

Size of Area of Search: 47 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|--|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The AoS is approximately 16km from the Leziate processing plant. It is likely that any extraction site would transfer mineral to the processing plant by road. | - Mineral extraction requires energy and therefore emits CO ₂ . There would also be CO ₂ emissions from road transportation to the processing plant. | + No contributions to climate change post extraction. There is the potential that restoration could include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS would lead to increased road transport to the processing plant. This would have a negative effect on air quality due to vehicle emissions. | - Due to increased road transport of silica sand. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the area of search boundary. | 0 It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. Silica sand extraction is not expected to cause vibration. Any future planning application within the AOS will need to ensure that proposed extraction is appropriately screened to mitigate visual intrusion. | 0 No effect post restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. The effect on employment is assessed under | 0 No effects expected during extraction. | ? As this is an area of search, it is unknown whether enhanced public access would be provided on restoration. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|---|---|
| | objective SA13. | | |
| SA5: To maintain and enhance the character of the townscape and historic environment | <p>The closest listed building is the Church of St Andrew which is 726 metres away. There are eight listed buildings within 2km of the AoS boundary. There is a Conservation Area, Shouldham Thorpe, within 2km of the boundary of the AoS, but no Registered Historic Parks and Gardens or Scheduled Monuments. The site has the potential to contain archaeological assets, but is unstudied.</p> | <p>- A future application should provide appropriate archaeological evaluation, which may provide an opportunity to investigate heritage assets that would not otherwise take place. A Heritage Statement should also be included, together, with appropriate mitigation. It is considered that mitigation measures are likely to result in extraction being able to take place with no unacceptable adverse impacts.</p> | <p>- A mitigation strategy should ensure that, the historic value of the assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts.</p> |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <p>The nearest internationally designated site is the Ouse Washes SAC which is over 9km from the AoS boundary</p> <p>The AoS is over 3km from both the River Nar and Setchey SSSIs.</p> <p>The closest County Wildlife Site is CWS 366 St Andrews Churchyard which is 600m from the AoS boundary.</p> <p>The nearest ancient woodland site is a PAWS which is 1.4km from the AoS boundary.</p> <p>The AoS has overburden made up</p> | <p>0 No impacts on the Ouse Washes are expected.</p> <p>Due to distance, no impacts on SSSIs are expected.</p> <p>Due to distance, no impacts on CWS are expected.</p> <p>No impacts on ancient woodland are expected.</p> <p>There is the potential</p> | <p>0 No impacts on the Ouse Washes are expected.</p> <p>No impacts on SSSIs are expected.</p> <p>No impacts on CWS are expected.</p> <p>No impacts on ancient woodland are expected.</p> <p>There would be a preference for</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|---|---|--|
| | of Till deposits partially overlying the Lower Cretaceous Leziate Beds. | for sites within this area to contain examples of geodiversity priority features. | restoration to provide opportunities for further geological research of suitable exposures. However, this may not always be possible. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | The preferred restoration for this site would be restoration for agriculture with additional areas of mixed deciduous woodland and hedgerows which would provide a net biodiversity gain. | 0 No effect during extraction phase | + There would be a positive effect for biodiversity if this AoS is restored to include additional mixed deciduous woodland and hedgerows and connectivity to other habitats. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | The area of search is not within a Core River Valley, or other designated landscape feature. | 0 It is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape. | 0 Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. Waterbodies, blocks of woodland, and farmland all form landscape features within the Area of Search. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | There are no public footpaths within the AoS. The nearest residential property is 250 metres from the AoS boundary. | 0 There is unlikely to be a significant impact on health or amenity from mineral extraction within the AoS. | 0 It is unlikely that there would be new public footpaths provided within the AoS on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | The AoS is located over a principal aquifer and partially over secondary A and B aquifers. However, there are no Groundwater Source Protection Zones in the AoS. | - A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts on water resources from dewatering operations undertaken to enable mineral extraction, | 0/- Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|--|---|---|
| | The AoS is classified as Grade 3 agricultural land and could potentially be Grade 3a which is classified within the Best and Most Versatile agricultural land. | Potential for BMV agricultural land to be affected by mineral extraction within the AoS. | Due to the likely depth of silica sand extraction, the land is unlikely to be restored to agriculture. Therefore there could be a permanent loss of Grade 3a agricultural land post extraction. |
| SA11: To promote sustainable use of minerals resources | The Area of Search is approximately 16km from the Leziate processing plant. | - Due to distance from processing plant. | 0 No effect post-extraction |
| SA12: To reduce the risk of current and future flooding at new and existing development | AOS I has a low probability of flooding from rivers within the borough council SFRA. Within AOS I, 2.8% of the area has a high probability of surface water flooding (greater than 1 in 30); 4.1% of the area has a medium probability (between 1 in 30 and 1 in 100) of surface water flooding, and 7.9% of the area has a low probability (between a 1 in 100 and 1 in 1,000) of surface water flooding. | ++ AOS I has a low risk of being affected by flooding from either rivers or the sea. Just over 4% of the area has a medium to high risk of being affected by surface water flooding. Silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones. | + There is potential for restoration to involve the creation of water bodies to provide flood storage capacity. |
| SA13: To encourage employment opportunities and promote economic growth | Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw | + | 0 No effect post restoration |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|-------------------|--|--------------------------------|-------------------------------|
| | material for glass manufacture elsewhere in the UK, for both bottles and flat window glass, providing downstream economic benefits. | | |
| Conclusion | <p>There are potential negative effects on the historic environment. It is considered that these effects could be appropriately mitigated. Adverse impacts are not expected on biodiversity. There are negative effects due to the distance from the existing processing plant at Leziate, compared to some of the other areas of search. There is the potential for a permanent loss of Grade 3a agricultural land, depending on where mineral extraction is located within the area of search. The area is at generally low risk of being affected by flooding from either rivers, the sea or surface water. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture.</p> | | |

Area of Search J – Land to the east of Tottenhill

Size of Area of Search: 23 hectares

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|--|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | The AoS is approximately 15km from the Leziate processing plant. It is likely that any extraction site would transfer mineral to the processing plant by road. | - Mineral extraction requires energy and therefore emits CO ₂ . There would also be CO ₂ emissions from road transportation to the processing plant. | + No contributions to climate change post extraction. There is the potential that restoration could include woodland as a carbon 'sink'. |
| SA2: To improve air quality in line with the National Air Quality Standards | The AoS is not within an AQMA. Mineral extracted from within the AoS would lead to increased road transport to the processing plant. This would have a negative effect on air quality due to vehicle emissions. | - Due to increased road transport of silica sand. | 0 No effect post restoration |
| SA3: To minimise noise, vibration and visual intrusion | The nearest residential property is approximately 250 metres from the AoS boundary. Tottenhill is less than 300m from the AoS boundary. | 0 It is considered that noise and dust can be mitigated to acceptable levels within 250 metres. Silica sand extraction is not expected to cause vibration. Any future planning application within the AoS will need to ensure that proposed extraction is appropriately screened to mitigate visual intrusion. | 0 No effect post restoration |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. The effect on employment is assessed under objective SA13. | 0 No effects expected during extraction. | ? As this is an area of search, it is unknown whether enhanced public access would be provided on restoration. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|--|--|--|
| SA5: To maintain and enhance the character of the townscape and historic environment | The closest listed building is 325 metres from the area of search boundary: Church of St Botolph. There are five listed buildings, three Scheduled Monuments, but no Conservation Areas or Registered Historic Parks within 2km of the AoS boundary. There are archaeological assets within the Area of Search. | - A future application should provide appropriate archaeological evaluation, which may provide an opportunity to investigate heritage assets that would not otherwise take place. A Heritage Statement should also be included, together, with appropriate mitigation. It is considered that mitigation measures are likely to result in extraction being able to take place with no unacceptable adverse impacts. | - A mitigation strategy should ensure that, the historic value of, the assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | <p>The nearest internationally designated site is the Ouse Washes SAC which is 10.8km from the AoS boundary.</p> <p>The River Nar SSSI is 2.35km from the AoS boundary. Setchey SSSI is 2km from the AoS boundary.</p> <p>CWS 385 'Tottenhill Village Green' is 250m from the AoS and CWS 424 'Westbrigg's Wood' is 380m from the AoS.</p> <p>The nearest ancient woodland site is a PAWS and is 2.96km from the AoS boundary.</p> | <p>0 No impacts on the Ouse Washes are expected.</p> <p>Due to the land being artificially drained to multiple outlets, the AoS does not drain to the River Nar or Setchey SSSI and therefore no adverse impacts are expected.</p> <p>If mineral extraction in this AoS were to go below the water table then there could be impacts on the ponds in CWS 385 and mitigation measures would be required.</p> <p>No impacts on ancient woodland are expected.</p> | <p>0 No impacts on the Ouse Washes are expected.</p> <p>No impacts on SSSIs post extraction.</p> <p>No impacts on CWS are expected post restoration.</p> <p>No impacts on ancient woodland are expected.</p> |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|--|---|---|---|
| | The Head deposits of the AoS overburden are geodiversity priority features due to their method of formation. | There is the potential for sites within this AoS to contain examples of geodiversity priority features. | There would be a preference for restoration to provide opportunities for further geological research of suitable exposures. However, this may not always be possible. |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | The preferred restoration for this site would be restoration for agriculture with additional areas of mixed deciduous woodland and hedgerows which would provide a net biodiversity gain. | 0 No effect during extraction phase | + There would be a positive effect for biodiversity if this AoS is restored to include additional mixed deciduous woodland and hedgerows. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | The area of search is not within a Core River Valley, or other designated landscape feature. | 0 It is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape. | 0 Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. Waterbodies from previous mineral workings, blocks of woodland, and farmland all form landscape features within the Area of Search. |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | There are no public footpaths within the AoS. The nearest residential property is 250 metres from the AoS boundary. | 0 There is unlikely to be a significant impact on health or amenity from mineral extraction within the AoS. | 0 It is unlikely that there would be new public footpaths provided within the AoS on restoration. |
| SA10: To protect and enhance water and soil quality in Norfolk | The AoS is located over a principal aquifer and partially over secondary A and B aquifers. However, there are no Groundwater Source Protection | 0 A Hydrological Risk Assessment will be required as part of any planning application within this AoS to ensure no unacceptable impacts | 0 Subject to the findings of a Hydrological Risk Assessment, no effect on water resources is expected post extraction. |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|---|---|---|---|
| | <p>Zones in the AoS.</p> <p>The AoS is classified as grade 4 agricultural land.</p> | <p>on water resources from dewatering operations undertaken to enable mineral extraction.</p> <p>No impacts on BMV agricultural soils.</p> | <p>No impacts on BMV agricultural soils.</p> |
| SA11: To promote sustainable use of minerals resources | The Area of Search is approximately 15km from the Leziate processing plant. | - Due to distance from processing plant. | 0 No effect post-extraction |
| SA12: To reduce the risk of current and future flooding at new and existing development | AOS J has a low probability of flooding from rivers within the borough council SFRA. Within AOS J, 1.5% of the area has a high probability (greater than 1 in 30) of surface water flooding; 3.6% of the area has a medium probability (between 1 in 30 and 1 in 100) of surface water flooding, and 9.2% of the area has a low probability (between 1 in 100 and 1 in 1000) of surface water flooding. | ++ AOS J has a low risk of being affected by flooding from either rivers or the sea. Less than 4% of the site has a medium to high risk of being affected by surface water flooding. Silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones. | + There is potential for restoration to involve the creation of water bodies to provide flood storage capacity. |
| SA13: To encourage employment opportunities and promote economic growth | Although employment levels at minerals extraction sites tend to be low, if silica sand is extracted from within this AoS it will supply the existing processing plant at Leziate and therefore offer continuing local employment opportunities. The processed silica sand is then a raw material for glass manufacture elsewhere in the UK, for both bottles and | + | 0 No effect post restoration |

| SA Objective | Comments | Assessment of Extraction Phase | Assessment of Post Extraction |
|-------------------|--|-----------------------------------|----------------------------------|
| | flat window glass, providing downstream economic benefits. | | |
| Conclusion | There are potential negative effects on the historic environment. It is considered that these effects could be appropriately mitigated. There are negative effects due to the distance from the existing processing plant at Leziate, compared to some of the other areas of search. The site is at generally low risk of being affected by flooding from either rivers, the sea or surface water. Silica sand extraction has positive economic impacts as it provides a raw material for glass manufacture. | | |

5.5 The Sequential Test of Flood Risk

A sequential test of flood risk has been carried out as part of the Single Issue Review. The findings of this assessment have been taken into consideration in this Sustainability Appraisal.

Guidance contained in the PPG is that the sequential test should be applied to mineral extraction and processing, where possible. The guidance recognises that sand and gravel extraction is defined as 'water-compatible development' and that deposits are often within flood risk areas. It is also recognised that as mineral workings can be large, there may be opportunities for applying the sequential approach at a site level. It may be possible for any ancillary facilities such as offices to be located in areas of lowest flood risk. Working and restoration can be designed to reduce flood risk by providing flood storage and attenuation. It is considered that the Areas of Search may provide opportunities for sequential working.

National planning policy and guidance requires planning authorities allocating land for development to apply the Sequential Test, to demonstrate that there are no reasonably available sites in areas with a lower probability of flooding which would be appropriate for the type of development or land use proposed. A sequential approach should be used in areas known to be at risk from other forms of flooding.

In areas at risk of river or sea flooding, preference should be given to locating new development in Flood Zone 1, ie with low probability of flooding. If there is no reasonably available site in Flood Zone 1, the flood vulnerability of the proposed development can be taken into account in locating development in Flood Zone 2, and then Flood Zone 3. Within each Flood Zone new development should be directed to sites at the lowest probability of flooding from all sources as indicated by the Strategic Flood Risk Assessment (SFRA).

The methodology followed for undertaking the sequential test has been set out in PPG: Flood and Climate Change.

The degree of Flood Risk at each silica sand area of search and specific site has been noted, using the Borough Council's Strategic Flood Risk Assessment as prepared to inform their own Local Plan. The Environment Agency's flood maps for Planning, Flood Map for Surface Water and Tidal Hazard maps have also been used. Using these sources, the County Council has carried out a Sequential Test of the Silica Sand Review.

The Borough Council of King's Lynn and West Norfolk have agreed a joint protocol with the Environment Agency, to the effect that as the Borough's own SFRA Flood Risk Assessment Maps are the most up to date, they will be used for the allocation of sites within their Local Plan instead of the Environment Agency's Flood Map for Planning. The SFRA Climate Change maps will similarly be used by the Borough Council when considering planning applications. However, as silica sand extraction is temporary, and the Silica Sand Review is planning for silica sand extraction up to 2026, the County Council has based its conclusions on the suitability of potential Areas of Search and the Specific site on the Borough Council's present-day scenario.

A summary of results of the Flood Risk Assessment at the sites are contained in the site assessments within the Sustainability Appraisal. In the Sequential Test, Table A lists all the sites over 20ha at the Preferred Options stage, whether or not they are identified as suitable for allocation, and irrespective of the level of flood risk at each.

The following were considerations when applying the sequential test to the Silica Sand Review.

- Silica sand is a mineral of national significance, and occurs in relatively few locations in England.
- Silica sand resources in Norfolk are in a relatively small area in the west of the county entirely within the administrative area of the Borough Council of King's Lynn and West Norfolk, and supply a single processing plant, at Leziate.
- 2,500,000 tonnes of silica sand need to be provided from Norfolk sites to address a shortfall in allocated sites during the plan period (to the end of 2026).
- Silica sand extraction is considered to be "water compatible development".
- Approximately 40 hectares of silica sand extraction would be required to meet the shortfall up to the end of 2026. This area may come from a combination of parts of any of the Areas of Search and the Specific Site proposed for allocation.
- The Areas of Search are large enough to allow a sequential approach to be applied at a site level within each of these Areas.
- Planning applications would need to comply with Development Management Policy DM4, on Flood Risk, in the adopted Norfolk Core Strategy and Minerals and Waste Development Management Policies DPD.
- The Area of Search Policy in the Silica Sand Review requires development of mineral extraction sites within the areas of search to follow a sequential approach to flood risk.

6 Task B4: Evaluating the Effects of the Silica Sand Review of the Minerals Site Specific Allocations DPD

6.1 Overall Effects of the Silica Sand Review

The overall effects of the proposed site and defined areas of search in the Silica Sand Review, on the SA/SEA objectives, are summarised in Table 6.1 below. The highest and lowest scores against each sustainability indicator have been highlighted in the table (allocated site are in **bold**):

| Ref: | SA1 | SA2 | SA3 | SA4 | SA5 | SA6 | SA7 | SA8 | SA9 | SA 10 | SA 11 | SA 12 | SA 13 |
|--------|-------------|-------------|-------------|------------|-------------|-------------|------------|-------------|------------|------------|-------------|-------------|------------|
| SIL 01 | ++/0 | 0/0 | 0/0 | 0/0 | -/- | -/0 | 0/+ | 0/0 | 0/0 | 0/0 | ++/0 | ++/+ | +/0 |
| AOS A | --/0 | --/0 | 0/0 | 0/? | -/- | -/0 | 0/+ | -/- | 0/+ | -/0- | --/0 | --/+ | +/0 |
| AOS B | --/0 | --/0 | --/0 | 0/? | --/- | --/- | 0/0 | --/- | 0/+ | -/0- | --/0 | --/+ | +/0 |
| AOS C | -/0 | -/0 | --/0 | 0/? | --/- | -/0 | 0/+ | --/- | -/+ | -/0- | -/0 | -/+ | +/0 |
| AOS D | 0/+ | -/0 | 0/0 | 0/? | -/- | -/0 | 0/+ | -/- | 0/+ | -/0- | +/0 | +/+ | +/0 |
| AOS E | -/+ | -/0 | 0/0 | 0/? | -/- | -/0 | 0/+ | -/- | 0/+ | -/0- | -/0 | -/+ | +/0 |
| AOS F | -/+ | -/0 | 0/0 | 0/? | -/- | -/0 | 0/+ | -/- | 0/0 | -/0- | -/0 | +/+ | +/0 |
| AOS G | ++/0 | 0/0 | 0/0 | 0/0 | -/- | -/0 | 0/+ | 0/0 | 0/0 | 0/0 | ++/0 | ++/+ | +/0 |
| AOS H | ++/0 | 0/0 | 0/0 | 0/0 | -/- | -/0 | 0/+ | 0/0 | 0/0 | 0/0 | ++/0 | ++/+ | +/0 |
| AOS I | -/+ | -/0 | 0/0 | 0/? | -/- | 0/0 | 0/+ | 0/0 | 0/0 | -/0- | -/0 | ++/+ | +/0 |
| AOS J | -/+ | -/0 | 0/0 | 0/? | -/- | 0/0 | 0/+ | 0/0 | 0/0 | 0/0 | -/0 | ++/+ | +/0 |

Details of specific effects for the proposed site and each area of search are provided in the individual appraisal tables in Section 5.

The main differences between the proposed site and areas of search that have been assessed are in relation to:

- Impacts regarding the distance of some areas from the existing processing plant (SA1, SA2 and SA11)
- Impacts on the historic environment (SA5)
- Impacts on landscape (SA8)
- Impacts on biodiversity (SA6)
- Flood risk (SA12)

There is limited variability in the scores for a number of sustainability indicators for the areas of search. This has occurred because of the methodology used to define the areas of search. For example, all areas of search are located at least 250 metres from residential dwellings, listed buildings, scheduled monuments, ancient woodland and sites of special scientific interest. Therefore variation has only occurred where constraints are located further away from some areas of search, or where the SA indicators assess constraints (such as County Wildlife Sites) that were not part of the methodology use to define the areas of search.

6.2 Short, Medium and Long Term Effects of the Silica Sand Review

The short and medium term effects of mineral extraction at the proposed specific site and within the areas of search are assessed under the 'operational' stage (the first SA score). Long term effects – restoration and post-restoration stages – are assessed by the second SA score.

6.3 Cumulative and Synergistic Effects of the Silica Sand Review and Consideration of Alternatives

It is important to note that the Core Strategy contains a policy on cumulative effects (Policy DM15) which recognises that a proposed mineral or waste site might be considered acceptable in its own right, but the cumulative impact of the proposal in conjunction with existing, permitted or allocated mineral or waste sites in the proximity may be unacceptable. Any cumulative impacts relating to transport (particularly HGV movements) would also need to be assessed under Policy CS15 (Transport).

Both the proposed site and all of the defined areas of search are located within the area covered by the Borough Council of King's Lynn and West Norfolk. This is because the silica sand resource in Norfolk is only located in this western part of the County. Within West Norfolk the location of the proposed site and areas of search are as follows (the areas of search that are not allocated are shown in grey):

| Reference | Size (hectares) | Allocated | Parishes |
|-----------|-----------------|-----------|---|
| SIL01 | 21 | Y | Bawsey |
| AOS A | 328 | Y | Ingoldisthorpe, Snettisham and Dersingham |
| AOS B | 240 | N | Heacham and Snettisham |
| AOS C | 65 | N | Hillington and Flitcham with Appleton |
| AOS D | 109 | Y | East Winch and Pentney |
| AOS E | 816 | Y | Wormegay, Shouldham, Marham, Shouldham Thorpe |
| AOS F | 61 | Y | Runcton Holme, Stow Bardolph |
| AOS G | 34 | N | Bawsey |
| AOS H | 29 | N | Bawsey |
| AOS I | 47 | Y | Runcton Holme, Shouldham Thorpe, Tottenhill |
| AOS J | 23 | Y | Tottenhill, Wormegay |

The allocated areas of search and specific site cover a much larger area (1,405 hectares) than is required for silica sand extraction over the plan period to 2026 (approx. 40 hectares). This situation is to be expected due to the purpose and definition of areas of search. It is expected that no more than two additional sites will be needed over the plan period (to 2026) to meet the predicted 2.5 million tonne shortfall in silica sand sites.

The areas of search vary significantly in size. Therefore the number of areas of search within a certain location is not a relevant measure of whether there could be cumulative impacts from mineral extraction. Areas of search are defined as "areas

where knowledge of mineral resources may be less certain but within which planning permission may be granted, particularly if there is a potential shortfall in supply". Therefore it is important to note that the size of any area of search does not relate to the size of a future mineral extraction operation that may take place within that area.

Whilst there are six areas of search considered appropriate to allocate, covering 1,405 hectares, it is expected that only 40 hectares from within the areas of search would be required for silica extraction over the plan period to 2026. These sites could therefore both be developed within one area of search, or in two different areas of search located over 20 kilometres apart. The existing silica sand extraction operations in Norfolk are located at East Winch and Middleton.

The reasons for each site or area of search being allocated, or not allocated, are listed below:

Areas of search not allocated:

AOS B - Due to the location of AOS B between the Norfolk Coast AONB and The Wash, there would be likely impacts on the landscape, historic environment and The Wash Special Protection Area from silica sand extraction within this area of search. Therefore AOS B is not allocated.

AOS C - The location of the River Babingley bisecting AOS C raises significant landscape issues. If the river valley is excluded from AOS C this leaves the AoS in two parts either side of the river. The southern section is considered inappropriate to allocate due to its proximity to Gatton Waters caravan park and potential impacts on the historic environment. The northern section is considered inappropriate to allocate due to potential impacts on the landscape and historic environment. Therefore AOS C is not allocated.

AOS G - An existing permitted silica sand extraction site is located within part of AOS G. Once the land within the existing mineral working has been removed from AOS G, the remaining proportion of AOS G is only 13 hectares. In the process used to define all the areas of search in the Preferred Options Consultation document, the minimum size that is considered to be a deliverable area of search is 20 hectares. Therefore, AOS G is not allocated.

AOS H - Site SIL 01 is located over a portion of AOS H. Once the land within SIL 01 has been removed from AOS H, the remaining proportion of AOS H is only 16 hectares. In the process used to define all the areas of search in the Preferred Options Consultation document, the minimum size that is considered to be a deliverable area of search is 20 hectares. Therefore, AOS H is not allocated.

Allocated specific site:

SIL01 – The site is located within an area of woodland and previous mineral extraction. The site is in close proximity to the existing processing plant. The only potential negative effects in the sustainability appraisal are regarding the historic environment, due to the location of a Grade II* listed church approximately 770 metres from the site, and biodiversity, because part of a County Wildlife Site is located within the site. It is considered that these effects could be appropriately mitigated and that a suitable planning application could come forward for silica sand extraction at the site.

Allocated areas of search:

Areas of search AOS A, AOS D, AOS E, AOS F, AOS I and AOS J are allocated in the Pre-Submission document.

Silica sand extraction within the allocated areas of search is expected to have a neutral effect on noise, vibration and visual intrusion (SA3); accessibility and social exclusion (SA4); site restoration (SA7); and health and amenity (SA9).

Silica sand extraction within the allocated areas of search is expected to have a positive effect on economic growth (SA13) because it provides a raw material for glass manufacture.

All of the allocated areas of search, except AOS D, are located at least 15km from the existing processing plant at Leziate and therefore have scored negatively against some sustainability indicators (SA1, SA2 and SA11) due to this distance. However, mineral can only be extracted where it is found and the industrial use of silica sand means that little mineral is used locally. The principal use of Norfolk's silica sand is as feedstock in glass manufacture, and the plants supplied are located in Northern England. The majority of the processed sand is transported to the glassworks by rail which requires a dedicated mineral railhead to facilitate loading. A railhead is located at the Leziate processing plant. For the total distance involved in transporting silica sand to its end user, rail is the most sustainable option available, with the distance from the extraction point to the processing/railhead making up a small proportion of the total distance. Therefore the distance of an area of search from the processing plant is not a reason for an area of search to not be allocated.

All of the allocated areas of search have the potential to have a negative effect on the historic environment (SA5). This is because all of the areas of search have at least one listed building located within 800 metres of the boundary and some have a number of listed buildings or scheduled monuments up to 250 metres from the boundary. The areas of search also have the potential to contain archaeological assets. A future planning application for silica sand extraction within an area of search should provide appropriate archaeological investigation. A Heritage Statement should also be included, together, with appropriate mitigation. It is considered that mitigation measures are likely to result in extraction being able to take place with no unacceptable adverse impacts and that the historic value of the assets is appropriately preserved. Mineral extraction will result in landscape change; however, an appropriate restoration scheme should ensure no unacceptable impacts. Therefore, it is considered that the areas of search are appropriate to be allocated.

Four of the allocated areas of search (AOS A, AOS D, AOS E and AOS F) scored negatively for potential effects on biodiversity (SA6) due to the location of County Wildlife Site (CWS) within or adjacent to the area of search. When the areas of search were defined, CWSs were not excluded from the areas of search. This is because CWSs are designated at a county level and silica sand is a nationally important industrial mineral. However, impacts on CWSs and appropriate mitigation will be assessed through the implementation of policy DM1 of the adopted Minerals and Waste Core Strategy at the planning application stage. It is considered that potential adverse impacts on CWSs could be appropriately mitigated, indeed a number of existing CWSs are the result of the restoration of

former silica sand workings and as such it is likely that mitigation could involve restoration to replace and potentially enlarge areas suitable for designation as a County Wildlife Site. Therefore the location of a County Wildlife Site is not a reason for an area of search to not be allocated.

AOS D scored negatively for potential effects on biodiversity (SA6) due to the proximity of two water dependent SSSIs. The SSSIs could be adversely affected if mineral extraction operations cause changes to the water table and/or dewatering is proposed. Therefore a hydrogeological risk assessment would be necessary at the planning application stage to identify potential risks and appropriate mitigation. It is considered that a suitable planning application could come forward within AOS D and it is therefore appropriate to allocate.

Areas of search AOS D, AOS F, AOS I and AOS J are at low risk of flooding and therefore scored positively against reducing flood risk (SA12). 40% of AOS E and 70% of AOS A are at medium to high risk of flooding from rivers or the sea. Therefore these two areas of search scored negatively against reducing flood risk. However, silica sand extraction is considered to be a 'water compatible' land use which is suitable in all flood zones. Silica sand extraction would be a temporary non-residential use, which exposes relatively few people to risk as only a small number of employees are required. Residual risk can be addressed through the use of a site evacuation plan. There is potential for restoration to involve the creation of water bodies to provide flood storage capacity. A sequential test has been carried out on the Silica Sand Review and it is considered that the areas of search at higher flood risk are appropriate to be allocated.

None of the areas of search are located within a designated landscape. However, silica sand extraction would be expected to cause landscape change (SA8). Therefore areas of search AOS A, AOS D, AOS E and AOS F, which are located in proximity to sensitive landscapes, scored negatively against this sustainability indicator. However, it is considered that an effective mitigation strategy could be designed to minimise unacceptable adverse impacts to countryside and landscape for silica sand extraction within these areas of search and an appropriate restoration scheme should ensure no unacceptable impacts. Therefore these areas of search are appropriate to be allocated.

All of the allocated areas of search, except AOS J, are at least partially located on Grade 3 agricultural land. The resolution of the Agricultural Land Classification means that field by field detail is not possible without site assessment, and site assessments can result in a classification which differs from the large scale published data. Any future planning application will need to include a soil quality assessment at a site level to determine whether any land defined as Grade 3 meets the definition for Grade 3a, or some other land grade. Appropriate justification and mitigation would be required for extraction to take place on land within the Best and Most Versatile classification (Grades 1, 2 and 3a). There is therefore the potential for adverse impacts on Best and Most Versatile agricultural land (SA10) depending on whether the Grade 3 land is assessed to be Grade 3a and also depending on whether silica sand extraction takes place within Grade 3a agricultural land. The areas of search are significantly larger than the potential area of extraction required to meet the silica sand shortfall up to the end of the plan period, therefore a number of alternatives will exist for suitable extraction locations within the areas of search. Due to these uncertainties about whether or not Grade

3a land would actually be affected it is therefore considered that the presence of Grade 3 agricultural land within an area of search is not a reason for non-allocation.

It is considered that the potential negative effects detailed above could be appropriately mitigated and that a suitable planning application for silica sand extraction could come forward within the areas of search. Therefore, areas of search AOS A, AOS D, AOS E, AOS F, AOS I and AOS J are considered appropriate to allocate.

Potential cumulative or synergistic effects which could result from the Silica Sand Review are listed below.

SIL01 is adjacent to both a mothballed silica sand extraction site (for foundry sand) and a former silica sand site in which extraction has ceased, but is currently being restored using silt and fines from silica sand processing. It is therefore highly unlikely that silica sand extraction would take place on site SIL01 at the same time as the adjacent permitted sites. Due to the location of site SIL01, as long as appropriate mitigation measures are followed no cumulative impacts are expected. Sand from SIL01 is expected to be transported to the processing plant by conveyor and therefore there would not be any cumulative traffic impacts.

AOS A - The nearest mineral extraction site to this area of search is Snettisham carstone working. Due to the small scale of this carstone extraction operation cumulative effects are not expected.

AOS D – The southern part of the area of search is in close proximity to a current sand and gravel mineral working and an allocated sand and gravel site (MIN 19) which could therefore take place during the same time period and could use Common Lane for access. There is the potential for cumulative transport impacts, although the silica sand could also be transported to the processing plant by alternative means, such as the use of a pipeline. If road transport is used, as long as appropriate mitigation measures are followed, no adverse impacts are expected from individual silica sand extraction sites within these areas of search. If silica sand extraction were to take place in more than one area of search at the same time, there would be the potential for cumulative impacts. Any potential cumulative impacts would be mitigated by appropriate planning conditions.

The northern boundary of **AOS E** and the southern boundary of **AOS D** are located on opposite sides of the River Nar. North of the River Nar is a current sand and gravel extraction site and an allocated sand and gravel extraction site (MIN19). North of AOS E is a mothballed sand and gravel site. As long as appropriate mitigation measures are followed, no adverse impacts are expected from individual silica sand extraction sites within these areas of search. If working was to take place simultaneously on AOS D, the existing sand and gravel workings and AOS E there is the potential for cumulative impacts. However, both AOS D and AOS E are significantly larger than the area of extraction required to meet the silica sand shortfall to the end of the plan period, and therefore a number of alternative extraction locations are likely within each area of search which could mitigate the potential for cumulative impacts. Any potential cumulative impacts would be mitigated by appropriate planning conditions.

Areas of search **AOS I**, **AOS J**, **AOS F** and **AOS E** are located in relative proximity to each other. As long as appropriate mitigation measures are followed, no

adverse impacts are expected from individual silica sand extraction sites within these areas of search. If silica sand extraction were to take place in more than one area of search at the same time, there would be the potential for cumulative impacts. Any potential cumulative impacts would be mitigated by appropriate planning conditions. There is an existing sand and gravel working at Tottenhill which also includes two site allocations to extend the working through the plan period. There is the potential for cumulative impacts in relation to transport if extraction occurs simultaneously at the areas of search AOS I, AOS J, AOS F, or AOS E. However, these cumulative impacts would be limited to the A10 north of Tottenhill; as the A10 is part of the strategic highway network it represents the most appropriate route for HGVs, it is not considered that there would be a very significant increase in HGV movements in percentage terms, on this strategic route. Any future planning application would be required to include a Transport Assessment and implement appropriate mitigation to address any highway impacts. Therefore it is considered that the potential for cumulative impacts from transport are not a reason for non-allocation of these areas of search.

The potential or simultaneous extraction in more than one location in the areas of search is not known. Due to the nature of areas of search and the sieve mapping process used in their definition there are a number of variables regarding the most likely locations for extraction to take place.

Certainty regarding the quality of the mineral resource is limited and is based on the best data available from the British Geological Survey. However, past workings have shown that the quality of the resource is variable across short distances. This is likely to be the case across the areas of search, so that some locations are less likely to be worked.

Land owner willingness for mineral extraction is a significant variable; landowners must be willing, so that extraction can take place. While some landowners have indicated that they are willing to explore the potential for extraction, this is unknown for many parts of the areas of search. No landowners have specifically indicated that they are unwilling for extraction to take place, which was a question in the Initial Consultation stage.

Another significant variable is the willingness for a mineral operator to extract mineral. Sibelco UK Ltd are the sole silica sand operator in Norfolk, and while other operators may choose to enter the market, this requires significant investment. Therefore Sibelco are the company most likely to carry out extraction in Norfolk, and it is unknown which areas of search they may consider to be preferable for extraction.

Previous experience of silica sand workings in Norfolk has indicated that working is more likely to take place within one site at a time, although working has occurred within different locations of the same site to allow silica sand of different properties to be blended to produce a product with the correct specifications for glass manufacture following processing. Therefore the potential for cumulative effects from multiple workings cannot be ruled out at this stage and has been considered. However, it is considered that assessment and appropriate mitigation measures at the planning application stage will ensure that future extraction could be made acceptable.

Significant Environmental Effects - Conclusion

Overall, the choice of allocated areas of search and specific site could have a number of significant environmental effects, without appropriate mitigation. Due to the temporary nature of silica sand extraction, most of the impacts will be of short and/or medium term duration only. Phasing of sites, mitigation measures (eg screening, tree-planting and HGV routing) and progressive working and restoration should ensure that impacts will be minimised to acceptable levels. Over the longer term restoration should provide opportunities for ecological improvements over the current state, although the nature of silica sand extraction will result in long-term landscape change as waterbodies will remain in some extracted areas.

The Core Strategy and Development Management policies, together with the specific site allocation and area of search policies in the Silica Sand Review, should ensure that appropriate mitigation measures (such as to reduce amenity, biodiversity, historic environment, and landscape impacts) are contained in future planning applications and enforced through planning conditions on future silica sand extraction within the specific site and areas of search to ensure that extraction could take place without significant environmental effects.

7 Task B5: Mitigation of Adverse Effects and Maximising Benefits

7.1 Recommendations and Mitigation

In accordance with SA guidance, measures to prevent, reduce or offset significant adverse effects of implementing the Silica Sand Review of the Minerals Site Specific Allocations DPD have been considered. General mitigation measures are addressed in Table 7-1 below, with measures for sites and areas of search set out in the individual site and area assessments. Typically these might include the requirements for particular HGV routing arrangements, advanced planting of boundary trees and a restoration scheme including particular habitat creation/re-creation. Appropriate location of mineral extraction sites is the most significant way that potential impacts can be mitigated.

Table 7-1 Possible mitigation measures for minerals extraction sites

| SA Objective | Possible mitigation measures |
|---|---|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | Research possible renewable energy sources to power activities at the site. Consider offsetting the CO ₂ release through a legitimate project. Consider carbon capture of operational CO ₂ release. |
| SA2: To improve air quality in line with the National Air Quality Standards | Increased traffic volumes will result in an increase in exhaust fumes (e.g. NO _x , PM ₁₀ etc.) in the immediate vicinity. Fumes can be reduced on site by employing an on-site speed limit and ensuring engines are turned off when stationary. |
| SA3: To minimise noise, vibration and visual intrusion | Ensure adequate bunds/screens/planting against noise, vibration and visual impact are erected while the site is in operation / in construction. Monitor noise to ensure that it does not exceed the relevant noise level limit. Design bunds/ screening to be sensitive to the surrounding area to reduce visual impact. Structures should be placed where they will have the least impact. |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | Mineral extraction sites are unlikely to provide improved accessibility to services and facilities and reduce social exclusion. |
| SA5: To maintain and enhance the character of the townscape and historic environment | Effects on nearby heritage assets can be reduced/ avoided with careful design of the extraction site. Archaeological investigations are usually required prior to mineral extraction. Location of access routes, large plant and obtrusive structures should be placed to avoid impact on the townscape and historic environment. |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | Carry out ecological surveys of the site prior o development and act upon suggestions for limiting impacts to local biodiversity. For |

| SA Objective | Possible mitigation measures |
|--|--|
| | <p>example, the protection of certain habitats, such as veteran trees, or the provision of compensatory habitat.</p> <p>If extraction is proposed below the water table and/or dewatering is proposed as part of the extraction operations, the impact of this activity on biodiversity must also be assessed and mitigated appropriately. For example, through artificial recharge of the groundwater levels. Schemes of working should take into account geodiversity by permitting access for recording and sampling during the active phase, and retaining geological sections for scientific and educational study, and potentially also benefit biodiversity, in the restoration phase.</p> |
| SA7: To promote innovative solutions for the restoration and after use of minerals sites | <p>Mineral extraction is a temporary use of land. Development associated with mineral extraction would only be permitted for the life of the mineral extraction operation. The proposed restoration scheme should be beneficial to the area after extraction is finished, in terms of landscape, biodiversity, geodiversity and public access.</p> |
| SA8: To protect and enhance the quality and distinctiveness of the countryside and landscape | <p>Location of access route, large plant and obtrusive structures should be placed to minimise impact on the countryside and landscape.</p> <p>Screening against noise, vibration and visual impacts should be appropriate to the local area.</p> |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | <p>Mitigation measures against dust release from mineral extraction and processing must be employed on the site. These are likely to include installing windbreaks, irrigation systems and wheel washing.</p> <p>Increased traffic volumes will result in an increase in exhaust fumes (e.g. NO_x, PM₁₀ etc.) in the immediate vicinity. Fumes can be reduced on site by employing an on-site speed limit and ensuring engines are turned off when stationary.</p> <p>The route taken by HGVs from the extraction site onto the strategic highway network should avoid unsuitable roads. Junction or highway improvements may be required or off-highway haul routes may be required to enable a suitable route to be provided.</p> |
| SA10: To protect and enhance water and soil quality in Norfolk | <p>Design drainage systems for the site to deal with run-off, preventing it from reaching any nearby watercourse or drinking water source. Include bunds and sumps where necessary.</p> <p>Any agriculturally valuable land on site will be temporarily unavailable as a result of</p> |

| SA Objective | Possible mitigation measures |
|---|--|
| | extraction. Soils should therefore be suitably stored and replaced as part of the site restoration. A well designed restoration scheme may reduce the long term impacts of development on the site. |
| SA11: To promote sustainable use of minerals resources | N/A. The purpose of the mineral extraction operation would be to provide mineral resources. |
| SA12: To reduce the risk of current and future flooding at new and existing development | Incorporate flood mitigation measures such as bunding, into the design of the development to reduce, or avoid, issues with flooding. Where sites or areas are within flood risk zones 3 or 2 and/or over 1 hectare in size, carry out a full flood risk assessment prior to development and act upon suggestions for limiting the impact of flooding on-site and off-site. |
| SA13: To encourage employment opportunities and promote economic growth | N/A. The supply of mineral resources is required in the construction industry (sand and gravel and carstone) and in glass manufacture (silica sand). Therefore the provision of mineral extraction sites will contribute to employment and economic growth. |

8 Task B6: Monitoring Proposals

8.1 Proposals for monitoring the Norfolk Minerals and Waste Local Plan

Section 35 of the Planning and Compulsory Purchase Act 2004 (amended by the Localism Act 2011) requires every local planning authority to prepare a Monitoring Report. This should contain information on the implementation of the Local Development Scheme and the extent to which the policies in the adopted Minerals and Waste Local Plan are being achieved.

Additionally, the Sustainability Appraisal on the Norfolk Minerals and Waste Local Plan must also be monitored and reported in accordance with the SEA Regulations. This allows for the effects of the implementation of the Local Plan on sustainability to be continuously monitored against the sustainability baseline. Monitoring of the SA will be integrated into the Minerals and Waste Local Plan Monitoring Reports.

The monitoring report will describe any changes to the sustainability baseline arising from the implementation of the Norfolk Minerals and Waste Local Plan, and how the County Council will work to mitigate any adverse effects identified. The SA/SEA process has assisted in developing a framework for monitoring. Indicators have been developed which will be used to monitor implementation of the Core Strategy, to check whether policies are delivering the predicted effects. The monitoring process will incorporate the following:

- Geographic Information Systems (GIS);
- Comparison of the current state against the baseline;
- Analysis of changes to indicators (positive or negative); and
- Analysis of performance against targets and objectives.

Table 8.1 overleaf describes the envisaged monitoring regime for this SA/SEA. Therefore the table only includes indicators relevant to minerals extraction and associated development. The table describes which indicators will be reviewed and when this information will be collected. It also delineates which indicators are contextual (denoted by a 'C'), relating to the general state of the environment, and which are related directly to and/or affected by the performance of the plan (denoted by a 'P').

| SA Objective | Type | Indicator | Baseline 2013/14 |
|---|-------------|--|--|
| SA1: To adapt to and mitigate the effects of climate change by reducing contributions to climate change | P | Carbon dioxide emissions by Local Authority Area | 6,559 kt generated in Norfolk (2013) Carbon Dioxide emissions for all authorities in Norfolk decreased between 2005-2013 except for King's Lynn and West Norfolk which increased. (DECC Local Authority carbon dioxide emissions: 2005-2013 (2015)) |
| SA2: To improve air quality in line with the National Air Quality Standards | C | Area of AQMAs | Total area of AQMAs in Norfolk is 282.3 hectares, the largest of which covers 274.6 hectares of Norwich City centre |
| | P | Number of minerals sites within an AQMA | None |
| SA3: To minimise noise, vibration and visual intrusion | P | Number of complaints about the adverse impacts of minerals developments | 2 substantiated complaints regarding mineral extraction |
| SA4: To improve accessibility to jobs, services and facilities and reduce social exclusion | C | Index of multiple deprivation: % lower super output areas in the 20% most deprived nationally | 9.6% (2010) |
| | C | Employment Deprivation: % lower super output areas in the 10% most deprived nationally | 6.4% (2010) |
| SA5: To maintain and enhance the character of the townscape and historic environment | C | Number of Listed Buildings | 10,569 (2014) |
| | P | Number of sites adjacent to (within 250m of) a Listed Building | 14 safeguarded mineral sites |
| | C | % of listed buildings at risk % of scheduled monuments at risk | 0.95% 5% |
| | P | Number of minerals sites adjacent to (within 250m of) a Scheduled Monument | 7 safeguarded mineral sites |
| | C | Number of registered historic parks and gardens | 51 (2014) |
| | P | Number of minerals sites in or adjacent to (within 250m of) a registered historic park or garden | Nil |
| | C | Number of Conservation Areas | 304 (2014) |
| | P | Number of minerals sites within or adjacent to (within 250m of) Conservation Areas | 4 safeguarded mineral sites |
| | P | Number of planning permissions granted contrary to historic environment objections from | None |

| SA Objective | Type | Indicator | Baseline 2013/14 |
|---|------|---|---|
| | | statutory consultees | |
| SA6: To protect and enhance Norfolk's biodiversity and geodiversity | C | Sites of Special Scientific Interest (SSSI): <ul style="list-style-type: none"> • Number • Area (ha) • % in favourable or recovering condition | 162 39,205 95% |
| | P | Number of minerals sites within 2km of as SSSI | 38 safeguarded mineral sites |
| | P | Number of minerals sites within 5km of a SPA | 16 safeguarded mineral sites |
| | P | Number of minerals sites within 5km of a SAC | 33 safeguarded mineral sites |
| | P | Number of minerals sites within 5km of a Ramsar site | 14 safeguarded mineral sites |
| | P | Number of minerals sites within 2km of a National Nature Reserve | 0 safeguarded mineral sites |
| | P | Number of minerals sites in or adjacent to (within 250m of) a Local Nature Reserve | 0 safeguarded mineral sites |
| | C | Number of County Wildlife Sites | 1,326 (July 2015) |
| | P | Number of minerals sites in or adjacent to (within 250m of) a County Wildlife Site | 22 safeguarded mineral sites |
| | P | Number of minerals sites in or adjacent to (within 250m of) a County Geodiversity Site | 1 safeguarded mineral site |
| | P | Number of planning permissions granted contrary to biodiversity or geodiversity objections from statutory consultees | None |
| | P | Number of planning permissions granted with restoration schemes providing geodiversity or biodiversity benefits | Two permissions granted for mineral extraction in 2013/14. One will not lead to any geodiversity or biodiversity benefits. One will have some biodiversity benefits on restoration. |
| SA7: To promote innovative solutions for the restoration and afteruse of minerals sites | P | % of mineral workings covered by progressive restoration schemes | Two permissions granted for mineral extraction in 2013/14; one with a progressive restoration scheme and one on a partially worked site which has a final restoration scheme. |
| SA8: To protect and enhance the quality and distinctiveness of the countryside | C | % woodland area land cover | 9.8% (2002) |
| | P | Number of minerals sites in or adjacent to (within 250m of) ancient woodland | 5 safeguarded mineral sites |
| | P | Number of minerals sites within | 2 safeguarded mineral |

| SA Objective | Type | Indicator | Baseline 2013/14 |
|---|------|--|---|
| and landscape | | the AONB | sites |
| | P | Number of minerals sites within the Heritage Coast area | None |
| | P | Number of minerals sites within the Broads Authority Area | 1 safeguarded mineral site |
| | P | Number of minerals sites within a Core River Valley | 11 safeguarded mineral sites |
| | P | Number of planning permissions granted contrary to landscape objections from statutory consultees | None |
| SA9: To contribute to improved health and amenity of local communities in Norfolk | C | % lower super output areas in Norfolk in the 10% most health deprived nationally | 2.45% (2010) |
| | C | % lower super output areas in Norfolk in the 10% most living environment deprived nationally | 3% (2010) |
| SA10: To protect and enhance water and soil quality in Norfolk | C | % of Biological River quality (good or very good) | 18% (Anglian Region) (2009) |
| | C | % of Chemical River Quality (good or very good) | |
| | C | % of land classified as Grade 1, 2 or 3 agricultural land | 78.6% |
| | P | Number of minerals sites in Grade 1 or 2 agricultural land | 4 safeguarded mineral sites |
| | P | Number of minerals sites within Groundwater Protection Zone 1 | 4 safeguarded mineral sites |
| | P | Number of planning permissions granted contrary to Environment Agency advice on water quality grounds | None |
| SA11: To promote sustainable use of minerals resources | P | Sand and gravel: Production –tonnes 10 years sales average – tonnes Permitted reserves – tonnes Landbank - years | 1,114,935 (2013) 1,705,088 (2004-2013) 13,335,398 (31/12/2013) 7.8 (31/12/2013) |
| | P | Carstone: Production – tonnes 10 years sales average – tonnes Permitted reserves – tonnes Landbank - years | 37,193 (2013) 123,306 (2004-2013) 1,841,470 (31/12/2013) 14.9 (31/12/2013) |
| | P | Silica sand: 3 year sales average – tonnes 10 years' sales average – tonnes Permitted reserve – tonnes Landbank – years | 777,100 (2011-2013) 665,600 (2004-2013) 4,300,000 (631/12/2013) 6.5 (31/12/2013) |
| SA12: To reduce the risk of current and future flooding at new and existing | P | Number of planning permissions granted contrary to the advice of the Environment Agency or Norfolk County Council as Lead Local Flood Risk Authority, on | None |

| SA Objective | Type | Indicator | Baseline 2013/14 |
|---|-------------|--------------------|---------------------------|
| development | | flood risk grounds | |
| SA13: To encourage employment opportunities and promote economic growth | C | Unemployment rate | 6.7% (Dec 2012- Dec 2013) |

9. SA/SEA Quality Assurance Checklist

| SA/SEA Quality Assurance Checklist | Has the requirement been satisfied |
|--|------------------------------------|
| Objectives and context | |
| The plan's purpose and objectives are made clear | ✓ |
| Sustainability issues, including international and EC objectives, are considered in developing objectives and targets | ✓ |
| SA objectives are clearly set out and linked to indicators and targets where appropriate | ✓ |
| Links with other related plans, programmes and polices are identified and explained | ✓ |
| Conflicts that exist between SA objectives, between SA and plan objectives and between SA and other plan objectives are identified and described | ✓ |
| Scoping | |
| The environmental consultation bodies are consulted in appropriate ways and at appropriate times | ✓ |
| The appraisal focuses on significant issues | ✓ |
| Technical , procedural and other difficulties encountered are discussed; assumptions and uncertainties are made explicit | ✓ |
| Reasons are given for eliminating issues from further consideration | ✓ |
| Options/Alternatives | |
| Realistic alternatives are considered for key issues, and the reasons for choosing them are documented | ✓ |
| Alternative include 'do nothing' and/or 'business as usual scenarios wherever relevant | ✓ |
| The sustainability effects (both adverse and beneficial) of each alternative are identified and compared | ✓ |
| Inconsistencies between the alternatives and other relevant plans, programmes or policies are identified and explained | ✓ |
| Reasons are given for selection or elimination of alternatives | ✓ |
| Baseline information | |
| Relevant aspects of the current state of the environment and their likely evolution without the plan are described | ✓ |
| Characteristics of areas likely to be significantly affected are described, including areas wider than the physical boundary of the plan area where it is likely to be affected by the plan where practicable. | ✓ |
| Difficulties such as deficiencies in information are explained | ✓ |
| Prediction and evaluation of likely significant effects | |
| Likely significant social, environmental and economic effects are identified, including those listed in the SEA Directive (biodiversity, population, human health, fauna, flora, soil, water, air, climate factors, material assets, cultural heritage and landscape), as relevant | ✓ |
| Both positive and negative effects are considered, and where practicable, the duration of effects (short, medium or long-term) is addressed | ✓ |
| Likely, secondary, cumulative and synergistic effects are identified where practicable | ✓ |
| Inter-relationships between effects are considered where practicable | ✓ |
| Where relevant, the prediction and evaluation of effects makes use | ✓ |

| SA/SEA Quality Assurance Checklist | Has the requirement been satisfied |
|--|---|
| of accepted standard, regulations and thresholds | |
| Methods used to evaluate the effects are described | ✓ |
| Mitigation measures | |
| Measures envisaged to prevent, reduce and offset any significant adverse effects of implementing the plan are indicated | ✓ |
| Issues to be taken into account in development consents are identified | ✓ |
| The Sustainability Appraisal Report | |
| Is clear and concise in its layout and presentation | ✓ |
| Uses simple, clear language and avoids or explains technical terms | ✓ |
| Explains the methodology used | ✓ |
| Explains who was consulted and what methods of consultation were used | ✓ |
| Identifies sources of information, including expert judgement and matters of opinion. | ✓ |
| Contains a non-technical summary | ✓ |
| Consultation | |
| The SA is consulted on as an integral part of the plan-making process | ✓ |
| The consultation bodies, other consultees and the public are consulted in ways which give them an early and effective opportunity within appropriate time frame to express their opinions on the draft plan and SA Report. | ✓ |
| Decision-making and information on the decision | |
| The SA Report and opinions of those consulted are taken into account in finalising and adopting the plan. | ✓ |
| An explanation is given of how they have been taken into account. | ✓ |
| Reasons are given for choices in the adopted plan, in the light of other reasonable options considered. | ✓ |
| Monitoring measures | |
| Measures proposed for monitoring are clear, practicable and linked to the indicators and objectives used in the SA. | ✓ |
| Monitoring is used, where appropriate, during implementation of the plan to make good deficiencies in baseline information in the SA | ✓ |
| Monitoring enables unforeseen adverse effects to be identified at an early stage. (These effects may include predictions which prove to be incorrect.) | ✓ |
| Proposals are made for action in response to significant adverse effects | ✓ |

10. Glossary

Air Quality Management Areas: Areas designated by local authorities because they are not likely to achieve national air quality objectives by the relevant deadlines.

Ancient woodland: An area of woodland which has had a continuous history of tree cover since at least 1600.

Area of Outstanding Natural Beauty (AONB): designated under the National Parks and Access to the Countryside Act 1949 for the purposes of preserving and enhancing their natural beauty.

Area of Search: areas where knowledge of mineral resources may be less certain but within which planning permission may be granted, particularly if there is a potential shortfall in supply. If it is not possible to designate Specific Sites, or Preferred Areas, the alternative way to plan for the steady and adequate supply of minerals is to designate Areas of Search.

Biodiversity: The variety of all life on earth (mammals, birds, fish, invertebrates, plants etc)

Conservation Area: An area designated by the Local Planning Authority under the Planning (Listed Buildings and Conservation Areas) Act 1990 as possessing special architectural or historical interest.

Core Strategy (for Minerals and Waste): This planning policy document contains the vision, objectives and strategic planning policies for minerals and waste development in Norfolk until 2026. The Minerals and Waste Core Strategy also includes Development Management policies which are used in the determination of planning applications to ensure that minerals extraction and associated development and waste management facilities can happen in a sustainable way.

Conservation Area: An area designated by the Local Planning Authority under the Planning (Listed Buildings and Conservation Areas) Act 1990 as possessing special architectural or historical interest.

County Wildlife Site: A site of local importance for wildlife. Outside SSSIs, County Wildlife Sites are the best sites for wildlife in Norfolk. Sites are designated using stringent criteria, by a committee composed of the Norfolk Wildlife Trust, Norfolk County Council, Natural England, the Norfolk Biological Records Centre, and the Norfolk Biodiversity partnership.

Cumulative Impact: The combined impacts of a number of developments on the environment, amenity, health, traffic etc.

Development Management: The process through which the Council determines whether a proposal for development should be granted planning permission, taking into account the development plan and any other material considerations.

Development Plan: This includes adopted Local Plans and neighbourhood plans and is defined in section 38 of the Planning and Compulsory Purchase Act 2004 (as amended) that set out the planning policies and proposals for the development and use of land. Decisions on planning applications must conform to the Development Plan, unless material considerations indicate otherwise.

Examination: The Local Plan will be subject to an independent examination by an independent planning inspector. The recommendations in the Inspectors report will inform the final adopted version, but are no longer legally-binding.

Geodiversity: The variety of rocks, minerals, fossils, soils and landforms, together with the natural processes which shape the landscape.

Groundwater: Water within soil, sediments or rocks below the ground surface. Water contained within underground strata is referred to as an aquifer.

Groundwater Source Protection Zone: The Environment Agency divides groundwater source catchments into four zones. These are based on the number of days taken by any pollutant to flow to the potable water abstraction borehole. Source protection Zone 1 is defined as a zone within which any contamination would reach the borehole within 50 days. This applies to groundwater at and below the watertable. This zone has a minimum 50 metre protection radius around the borehole. These zones are designed to provide control over activities taking place near boreholes which could result in contamination reaching the public water supply.

Habitats Regulations Assessment (Appropriate Assessment): *Directive 92/43/EEC (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora* requires an Appropriate Assessment to be undertaken to assess the impacts of a land-use plan against the conservation objectives of a European Site and to ascertain whether it would adversely affect the integrity of that site.

Heritage asset: A World Heritage Site, Scheduled Monument, Listed Building, Protected Wreck Site, Registered Park and Garden, Registered Battlefield or Conservation Area designated under the relevant legislation.

Landbank: A stock of mineral reserves with planning permission for their extraction.

Listed building: A building or other structure officially designated as being of special architectural, historical or cultural significance using provisions under the Planning (Listed Buildings and Conservation Areas) Act 1990.. A listed building may not be demolished, extended or altered without special permission being granted by the Local Planning Authority. The Local Planning Authority must also consider if development nearby could cause adverse impacts to the listed building, and whether mitigation could address these impacts.

Local Development Scheme: Describes the Local Plan documents which the authority intends to prepare and the timetable for their preparation.

Local Planning Authority: An organisation with statutory planning powers, ie the relevant County, District, Borough or Unitary Council.

Local Plan: The plan for the future development of the local area, drawn up by the local planning authority in consultation with the community. In law this is described as the development plan documents adopted under the Planning and Compulsory Purchase Act 2004 (as amended). Current core strategies or other planning policies, which under the regulations would be considered to be development plan documents, form part of the Local Plan. The term includes old policies which have been saved under the 2004 Act.

Mineral Consultation Area: An area identified in order to ensure consultation between the relevant LPA and the Mineral Planning Authority before certain non-mineral planning applications made within the area are determined

Mineral Safeguarding Area: An area designated by Minerals Planning Authorities which covers known deposits of minerals which are desired to be kept safeguarded from unnecessary sterilisation by non-mineral development.

Mineral Planning Authority: An organisation with statutory planning powers relating to minerals development, in most areas the County or Unitary Council.

Mitigation: Measures to reduce, avoid or remedy any adverse impacts caused by development.

National Planning Policy Framework: This document sets out the Government's planning policies for England and was published on 27 March 2012. The NPPF must be taken into account in the preparation of Local and neighbourhood Plans, and is a material consideration in planning decisions. It states that in order to be considered sound a Local Plan should be consistent with national planning policy.

National Planning Practice Guidance: A web-based resource published by the Department for Communities and Local Government (DCLG) on 6 March 2014 and updated as needed. It is available at:
<http://planningguidance.planningportal.gov.uk/blog/guidance/>

Permitted reserves: Saleable minerals in the ground with planning permission for extraction. Usually expressed in million tonnes.

Planning conditions: Conditions attached to a planning permission for the purpose of regulating and controlling the development.

Preferred Areas: If it is not possible to designate Specific Sites, the next way to plan for a steady and adequate supply of minerals is to designate preferred areas, which are areas of known resources where planning permission might reasonably be anticipated. Such areas may also include essential operations associated with mineral extraction.

Principal Aquifers: These are layers of rock or drift deposits that have high intergranular and/or fracture permeability - meaning they usually provide a high level of water storage. They may support water supply and/or river base flow on a strategic scale. In most cases, principal aquifers are aquifers previously designated as major aquifer.

Proximity principle: The EU Waste Framework Directive (2008/98/EC) requires Member States to "establish an integrated and adequate network of waste disposal installations and of installations for the recovery of mixed municipal waste collected from private households. The network shall enable waste to be disposed of or recovered in one of the nearest appropriate installations, by means of the most appropriate methods and technologies...". The requirement for waste to be disposed of or recovered in one of the nearest appropriate installations is called the proximity principle.

Ramsar sites: Wetlands of international importance, designated under the 1971 Ramsar Convention

Restoration: Operations designed to return an area to an acceptable environmental state, whether for the resumption of the former land use or for a new use following mineral working. Involves the reinstatement of land by contouring, the spreading of soils or soil making materials etc.

Scheduled Monuments: Nationally important monuments and archaeological areas protected under the Ancient Monuments and Archaeological Areas Act

Secondary Aquifers: These include a wide range of rock layers or drift deposits with an equally wide range of water permeability and storage. Secondary aquifers are subdivided into two types:

Secondary A - permeable layers capable of supporting water supplies at a local rather than strategic scale, and in some cases forming an important source of base flow to rivers. These are generally aquifers formerly classified as minor aquifers;

Secondary B - predominantly lower permeability layers which may store and yield limited amounts of groundwater due to localised features such as fissures, thin permeable horizons and weathering. These are generally the water-bearing parts of the former non-aquifers.

Secondary Undifferentiated - has been assigned in cases where it has not been possible to attribute either category A or B to a rock type. In most cases, this means that the layer in question has previously been designated as both minor and non-aquifer in different locations due to the variable characteristics of the rock type.

Setting of a heritage asset: The surroundings in which a heritage asset is experienced. Its extent is not fixed and may change as the asset and its surroundings evolve. Elements of a setting may make a positive or negative contribution to the significance of an asset, may affect the ability to appreciate that significance or may be neutral.

Site Specific Allocations: Also known as Specific Sites - where viable resources are known to exist, landowners are supportive of minerals development and the proposal is likely to be acceptable in planning terms. Such sites may also include essential operations associated with mineral extraction. This is the preferred way to plan for the steady and adequate supply of minerals as it provides the necessary certainty on when and where development may take place.

Site of Specific Scientific Interest (SSSI): Sites designated by Natural England under the Wildlife and Countryside Act 1981

Special Areas of Conservation (SAC): SSSIs given special protection under the European Union's Habitats Directive, which is transposed into UK law by the Habitats and Conservation of Species Regulations 2010.

Special Protection Areas (SPA): SSSIs which have been identified as being of international importance for the breeding, feeding, wintering or the migration of rare and vulnerable species of birds found in European Union countries. They are European designated sites, classified under the EC Directive on the Conservation of Wild Birds.

Statement of Community Involvement: A document that sets out a local planning authority's intended consultation strategy for different elements of the planning process. This is a requirement of the Planning and Compulsory Purchase Act 2004.

Strategic Environmental Assessment: A procedure (set out in the Environmental Assessment of Plans and Programmes Regulations 2004) which requires the formal environmental assessment of certain plans and programmes which are likely to have significant effects on the environment.

Submission: A stage of the Local Plan preparation process where the plan is 'submitted' to the Secretary of State for independent examination by a planning inspector.

Sustainability Appraisal: An evaluation process for assessing the environmental, social, economic and other sustainability effects of plans and programmes. This is a statutory requirement.

Sustainable development: Development which meets the needs of the present without compromising the ability of future generations to meet their own needs.