# Essex County Council Replacement Minerals Local Plan: Pre Submission Draft

## Habitat Regulations Assessment

Report
November 2012

Prepared for

Essex County Council

# Revision Schedule

**Essex County Council Replacement Minerals Local Plan Pre Submission Draft – Habitat Regulations Assessment**
November 2012

| Rev | Date | Details | Prepared by | Reviewed by | Approved by |
|---|---|---|---|---|---|
| 01 | 26/09/12 | Draft for client review | **Dr James Riley** Principal Ecologist | **Dr Jo Hughes** Director | **Dr Jo Hughes** Director |
| 02 | 09/11/12 | Updated draft | **Dr James Riley** Principal Ecologist | | |



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# 1 Introduction

1.1.1 This Habitat Regulations Assessment report addresses the Replacement Minerals Local Plan: Pre Submission Draft. It builds on HRA work undertaken for the Preferred Options in 2010 and the Further Sites Consultation in spring 2012. Its purpose is to evaluate all the policies and Preferred Sites (i.e. allocated site) within the Replacement Minerals Local Plan: Pre Submission Draft and conclude whether there is likely to be a significant effect on European sites either alone or in combination with other projects and plans.

## 1.2 Legislation

1.2.1 The need for Habitat Regulations Assessment (Appropriate Assessment) is set out within Article 6 of the EC Habitats Directive 1992, and interpreted into British law by the Conservation of Habitats and Species Regulations 2010. The ultimate aim of the Directive is to "*maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest"* (Habitats Directive, Article 2(2)). This aim relates to habitats and species, not the European sites themselves, although the sites have a significant role in delivering favourable conservation status.

1.2.2 The Habitats Directive applies the precautionary principle to protected areas; plans and projects can only be permitted having ascertained that there will be no adverse effect on the integrity of the site(s) in question. This is in contrast to the SEA Directive which does not prescribe how plan or programme proponents should respond to the findings of an environmental assessment; it simply says that the assessment findings (as documented in the 'environmental report') should be 'taken into account' during preparation of the plan or programme. In the case of the Habitats Directive, potentially damaging plans and projects may still be permitted if there are no alternatives to them and there are Imperative Reasons of Overriding Public Interest (IROPI) as to why they should go ahead. In such cases, compensation will be necessary to ensure the overall integrity of the site network.

1.2.3 A screening (Likely Significant Effects) exercise is first required. In order to ascertain whether or not site integrity will be affected, an Appropriate Assessment should be undertaken of the plan or project in question:

**Box 1. The legislative basis for Appropriate Assessment**

**Habitats Directive 1992**

Article 6 (3) states that:

*"Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site's conservation objectives."*

**Conservation of Habitats and Species Regulations 2010 (as amended)**

The Regulations state that:

"*A competent authority, before deciding to … give any consent for a plan or project which is likely to have a significant effect on a European site … shall make an appropriate assessment of the implications for the site in view of that sites conservation objectives… The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site*".

1.2.4 Over the years the phrase 'Habitat Regulations Assessment' (HRA) has come into wide currency to describe the overall process set out in the Conservation of Habitats and Species Regulations from screening through to IROPI. This has arisen in order to distinguish the process from the individual stage described in the law as an 'appropriate assessment'. Throughout this report we use the term Habitat Regulations Assessment for the overall process and restrict the use of Appropriate Assessment to the specific stage of that name.

## 1.3 Scope and Objectives

1.3.1 It is intended that the Replacement Minerals Local Plan: Pre Submission Draft will cover the period from publication to 2029, and will replace the existing saved policies from the previous Minerals Local Plan 1996 for the protection of the environment, sustainable transport priorities, and the scale, pattern and location of minerals development across Essex (excluding the unitary authorities of Thurrock and Southend-on-Sea). The proposed date of adoption of the Replacement Minerals Local Plan: Pre Submission Draft (hereafter known as the Minerals Local Plan) is 2014.

1.3.2 The HRA draws upon knowledge of European designated sites, including URS specialist knowledge of these sites in the context of other HRAs URS has previously carried out.

1.3.3 The purpose of this current document is to:

- Confirm the European sites (Special Areas of Conservation, Special Protection Areas and Ramsar sites) that could potentially be affected by site allocations and Preferred Approaches; details of their European interest features and the environmental conditions that are required to maintain the favourable conservation status of those features;
- Discuss the vulnerability of these European sites to potential impacts arising from the Minerals Local Plan, based on current knowledge;

- Where possible, identify those Approaches or Preferred Sites that may conflict with maintaining the favourable conservation of the European sites, based on current knowledge;
- Identify those Approaches or Preferred Sites for which full Appropriate Assessment is required;
- Ultimately propose amendments and alterations to Preferred Approaches, and site allocations where necessary in order to account for the vulnerabilities of these designated sites and thereby avoid adverse impacts both individually and in combination with other projects or plans; and
- Formally assess the Minerals Local Plan in accordance with the requirements of the Conservation of Habitats and Species Regulations 2010.

1.3.4 There are twenty-five Special Areas of Conservation (SACs), Special Protection Areas (SPAs) or Ramsar sites that lie wholly or partly within Essex (Figure 1) (counting the different designations as separate sites):

- Essex Estuaries SAC
- Benfleet and Southend Marshes SPA and Ramsar
- Blackwater Estuary (mid-Essex Coast Phase 4) SPA and Ramsar
- Colne Estuary (mid-Essex Coast Phase 2) SPA and Ramsar
- Crouch and Roach Estuaries (mid-Essex Coast Phase 3) SPA and Ramsar
- Dengie (mid-Essex Coast Phase 1) SPA and Ramsar
- Foulness (mid-Essex Coast Phase 5) SPA and Ramsar
- Lee Valley SPA and Ramsar
- Thames Estuary and Marshes SPA and Ramsar
- Stour and Orwell Estuaries SPA and Ramsar
- Hamford Water SPA and Ramsar
- Abberton Reservoir SPA and Ramsar
- Epping Forest SAC
- Outer Thames Estuary pSPA

1.3.5 Chapter 2 explains the process by which the HRA process as a whole has been carried out. Chapter 3 outlines the Pathways of Impacts that can arise from minerals preferred approaches/sites, and their possible impacts on European designated sites. The Likely Significant Effect analysis is presented in Chapter 4. Chapter 5 then summarises the key findings of the HRA, including the recommended amendments to the Minerals Local Plan.

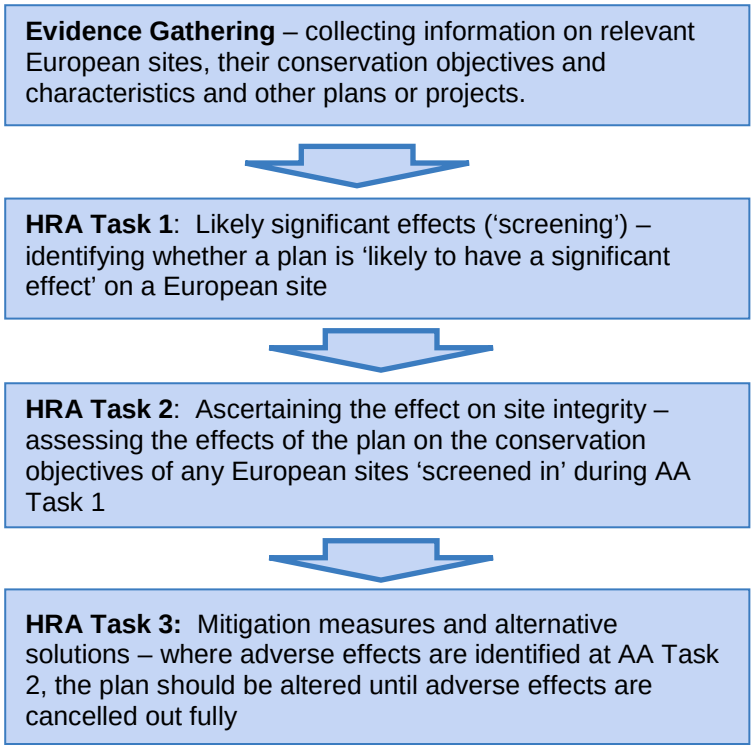
# 2 Methodology

## 2.1 Process

2.1.1 The methodology adopted is in compliance with emerging Government guidance[1]. Communities and Local Government released a consultation paper on Appropriate Assessment of Plans in 2006[2]. As yet, no further formal guidance has emerged.

2.1.2 Figure 2 below outlines the stages of HRA according to current draft CLG guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

Figure 2 - Four-Stage Approach to Habitat Regulations Assessment
Source: CLG, 2006




## 2.2 Likely Significant Effects (LSE)

2.2.1 The first stage of any Habitat Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

[1] *Planning for the Protection of European Sites: Appropriate Assessment*. Under The Conservation (Natural Habitats, &c) (Amendment) (England and Wales) Regulations 2006 Guidance for Regional Spatial Strategies and Local Development Documents.
[2] CLG (2006) *Planning for the Protection of European Sites*, Consultation Paper

*2.2.2* *"Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"*

2.2.3 The objective is to 'screen out' those plans and projects that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism for an adverse interaction with European sites.

2.2.4 In this case, the plan as a whole has been evaluated in detail within the context of existing knowledge of the various ways in which development can impact on European sites, accumulated from carrying out HRAs across the country at all geographical scales. If it cannot be concluded with confidence that adverse effects are unlikely, we have deferred to the precautionary principle and assumed that they require investigation in the Appropriate Assessment.

2.2.5 The Likely Significant Effect test is the subject of this report.

## 2.3 Confirming other plans and projects that may act in combination

2.3.1 It is neither practical nor necessary to assess the 'in combination' effects of the Minerals Local Plan within the context of all other plans and projects within the East of England. In practice therefore, in combination assessment is of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential. For the purposes of this assessment, we have determined that, due to the nature of the identified impacts, the key other plans and projects relate to the additional housing, commercial/industrial allocations, minerals and waste strategies and major infrastructure projects proposed for Essex and surrounding authorities over the lifetime of the Minerals Local Plan policies.

2.3.2 The former Regional Spatial Strategy for the East of England (2008)[3] provides a good introduction to proposals for Essex as a whole, and surrounding counties. As of 6th July 2010, following a letter from the Secretary of State for CLG, Regional Strategies are to be revoked. Guidance issued concurrently indicates that evidence that informed the preparation of Regional Strategies may still be a material consideration in development management decisions and in informing DPD production. Table 1 below outlines the plans and projects that have been identified as relevant to the pathways for effects upon European sites. These include those that are considered likely to influence:

- Surface water or groundwater dynamics or quality within the catchment of the Essex Estuaries SAC or associated SPAs and Ramsar sites, the Thames Estuary and Marshes SPA/Ramsar, and Stour & Orwell Estuaries SPA/Ramsar, Abberton Reservoir SPA/Ramsar, Lee Valley SPA/Ramsar, Hamford Water SPA/Ramsar, Benfleet & Southend Marshes SPA/Ramsar and the Stour & Orwell Estuaries SPA/Ramsar;
- Traffic along roads passing through or close to Epping Forest SAC;
- Bird disturbance at the mid-Essex coast estuaries SPAs and Ramsar sites, the Thames Estuary and Marshes SPA/Ramsar, Abberton Reservoir SPA/Ramsar, Lee Valley SPA/Ramsar, Hamford Water SPA/Ramsar, Benfleet & Southend Marshes SPA/Ramsar and the Stour & Orwell Estuaries SPA/Ramsar;

[3] http://www.gos.gov.uk/goee/docs/Planning/Regional_Planning/Regional_Spatial_Strategy/EE_Plan1.pdf

- Coastal dynamics at the Essex Estuaries SAC or associated SPAs and Ramsar sites, the Thames Estuary and Marshes SPA/Ramsar, Hamford Water SPA/Ramsar, Benfleet & Southend Marshes SPA/Ramsar and Stour & Orwell Estuaries SPA/Ramsar;
- Possible land take or disturbance to important areas for birds using areas outside of the SPAs/Ramsar sites within Essex, and also the Thames Estuary and Marshes SPA/Ramsar; and
- The overall increase in population and thus recreational pressure and disturbance on European sites within Essex and neighbouring authorities.

Consideration is also given to the effect of plans on a proposed new Outer Thames Estuary SPA.

**Table 1 - Other Plans and Projects and Relevant Potential Impacts**

| Plan / Project | Relevance |
|---|---|
| Essex Coast and Estuaries Coastal Habitat Management Plan (CHaMP), 2002 | Provides a long-term strategic view on habitats and species of European interest (particularly intertidal and freshwater habitats in the coastal zone) in the light of rising sea levels, and the flood defence response to it. Potentially relevant in terms of the effects of coastal squeeze on European designated sites. |
| Essex Estuarine Strategies (2008) | Development of long-term strategies for flood management. Potentially relevant in terms of the effects of coastal squeeze on European designated sites. |
| Draft Essex and Suffolk Shoreline Management Plan (2010) | Development of strategies for coastal management and protection. Potentially relevant in terms of the effects of coastal squeeze on European designated sites |
| Castle Point Local Plan (Issues and Options, 2012) | Sets out the spatial strategy for Castle Point including housing |
| Thurrock Core Strategy (Adopted, 2011) | Sets out the spatial strategy for Thurrock including housing |
| Southend-on-Sea Core Strategy (Adopted) | Sets out the spatial strategy for Southend-on-Sea including housing; |
| Rochford Core Strategy (Adopted, 2011) | Sets out the spatial strategy for Rochford including housing |
| Basildon Core Strategy (Preferred Options, 2012) | Sets out the spatial strategy for Basildon including housing |
| Brentwood Local Plan (Neighbourhood Consultation, 2011) | Sets out the spatial strategy for Brentwood including housing |
| Maldon Core Strategy | Sets out the spatial strategy for Maldon including housing |
| Chelmsford Core Strategy (Review, 2012) | Sets out the spatial strategy for Chelmsford including housing |
| Harlow Core Strategy (Issues and Options, 2011) | Sets out the spatial strategy for Harlow including housing |
| Uttlesford Core Strategy (2012) | Sets out the spatial strategy for Uttlesford including housing |
| Braintree Core Strategy (Adopted, 2011) | Sets out the spatial strategy for Braintree including housing |

| Plan / Project | Relevance |
|---|---|
| Colchester Core Strategy (Adopted, 2008) | Sets out the spatial strategy for Colchester including housing |
| Tendring Local Plan (2012) | Sets out the spatial strategy for Tendring including housing |
| Essex Waste Local Plan (Issues and Options, 2010) | Set out the spatial strategy for waste treatment provision in Essex |
| Suffolk Minerals Development Plan Core Strategy (2008) and Site Allocations DPD (2009) | Includes minerals policies and locations |
| Hertfordshire Minerals Development Scheme (2008) | Includes saved minerals policies from Local Plan |
| Cambridgeshire and Peterborough Minerals and Waste Plan DPD (Submission Stage, 2010) | Includes minerals policies and locations |
| Thurrock Minerals and Waste Issues and Options (2008) | Includes minerals policies |
| Aviation White Paper (2003) | Strategic framework for expansion of airport capacity in UK; relevant in that it defines airport growth and requires consideration for localised disturbance issues |
| Onshore wind farms – operational and in planning (as listed by British Wind Energy Association) | Wind farms have potential to affect European sites during construction and operation |
| Essex Local Transport Plan (2006-2011) | Sets out road schemes that could potentially affect traffic, and therefore air quality, close to European designated sites |
| Local transport Plans for surrounding authorities | Set out transport schemes that could potentially affect traffic passing into and out of Essex, close to European designated sites |
| European site Management Plans (where available) | Set out management strategies for designated sites |
| Water Resource Management Plans | Define how demand for water resources will be met over the lifetime of the Minerals Local Plan |
| Environment Agency Catchment Abstraction Management Strategies | Provide strategies to ensure water resource availability in Essex and surrounding areas |
| Environment Agency Catchment Flood Management Plans | Provide strategies to ensure flood risk management within Essex |
| Environment Agency Stage 3 and 4 Reviews of Consents | Inform licensing strategies to prevent damage to European sites from adverse impacts of water resource depletion or reduction in water quality. |
| Port expansions – Bathside Bay/Haven Port and Shell Haven Container Port | Projects that could have potential in combination effects with minerals transport |

2.3.3 In addition to reviewing plans and projects that may interact with the Essex County Council Minerals Local Plan, we will also make use of sources of information that provide information (but not plans) regarding European designated sites, including:

- Nature on the Map and its links to SSSI citations and the JNCC website (www.natureonthemap.org.uk);
- The UK Air Pollution Information System (www.apis.ac.uk); and
- Habitats Regulation Assessments of LDF DPDs where available

## 2.4 Physical Scope of the Assessment

2.4.1 There is no pre-defined guidance that dictates the physical scope of a HRA of a Minerals Local Plan. In considering the physical scope of the assessment, we were therefore guided primarily by the identified impact pathways rather than by arbitrary 'zones'. However, it was considered advisable to 'scope in' all European sites in Essex for a first appraisal, plus those that lie close to the borders of the area. These have been listed in section 1.2.6 of this report and the interest features of all these sites are detailed in Appendix 2 along with the key environmental conditions necessary to maintain the integrity of the sites.

2.4.2 Outside of Essex, the following sites lie within a close distance, and are connected by potential pathways of impact, so that they are considered as part of this HRA:

- Thames Estuary and Marshes SPA and Ramsar in Kent and Thurrock (within 500m of the county boundary between Essex and Kent, and less than 5km into Thurrock)

2.4.3 No pathways to other European sites outside Essex were identified. Information available from Natural England and the Joint Nature Conservation Committee provides a good introduction to the reasons for the designation of the European sites. This has been supplemented by information gained during consultation with the relevant agencies, notably Natural England and the Environment Agency. This information has informed the site descriptions in Appendix 2.

# 3 Pathways of Impact

## 3.1 Introduction

3.1.1 In carrying out an HRA it is important to avoid confining oneself to effectively arbitrary boundaries (such as Local Authority boundaries) but to use ones understanding of the various ways in which land use plans can impact on European sites to follow the pathways along which development can be connected with European sites, in some cases many kilometres distant. Briefly defined, pathways are routes by which a change in activity associated with a development can lead to an effect upon a European site. It is also important to bear in mind CLG guidance which states that the AA should be '*proportionate to the geographical scope of the [plan preferred option]*' and that '*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*' (CLG, 2006, p.6[4]).

3.1.2 When considering policies concerning minerals development, the following pathways of impact should be considered as presenting possibilities of adverse effects on European designated sites.

## 3.2 Atmospheric Pollution

3.2.1 The main pollutants of concern for European sites are oxides of nitrogen (NOx), ammonia ($NH_3$) and sulphur dioxide ($SO_2$). NOx can have a directly toxic effect upon vegetation. In addition, greater NOx or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

3.2.2 Air pollution at many European sites is already believed to be having an adverse effect. Eutrophication of sensitive habitats through atmospheric deposition is a widely acknowledged phenomenon, although it is extremely difficult to measure as its effects are often hidden by changes in local nutrients (i.e. via direct fertilisation) or changes in grazing pressure. Minerals extraction, reprocessing and movement can generate dust (covered in paragraph 3.2.18 and 3.2.19) while heavy duty vehicle exhausts associated with minerals extraction and movement result in emissions of NOx, which can contribute in turn to acid and nitrogen deposition.

**Table 2. Main sources and effects of air pollutants on habitats and species**

| Pollutant | Source | Effects on habitats and species |
|---|---|---|
| Acid deposition | $SO_2$, NOx and ammonia all contribute to acid deposition. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is likely that increased N emissions may cancel out any gains produced by reduced S levels. | Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity. |
| Ammonia ($NH_3$) | Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in | Adverse effects are as a result of nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and $NH_3$ is rapidly |

[4] Department for Communities and Local Government. 2006. *Planning for the Protection of European Sites: Appropriate Assessment*. http://www.communities.gov.uk/index.asp?id=1502244

| Pollutant | Source | Effects on habitats and species |
|---|---|---|
| | numbers of agricultural livestock. Ammonia reacts with acid pollutants such as the products of $SO_2$ and $NO_X$ emissions to produce fine ammonium ($NH_4$+)- containing aerosol which may be transferred much longer distances (can therefore be a significant trans-boundary issue.) | deposited, some of the most acute problems of $NH_3$ deposition are for small relict nature reserves located in intensive agricultural landscapes. |
| Nitrogen oxides $NO_x$ | Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations, one-half from motor vehicles, and the rest from other industrial and domestic combustion processes. | Deposition of nitrogen compounds (nitrates ($NO_3$), nitrogen dioxide ($NO_2$) and nitric acid ($HNO_3$)) can lead to both soil and freshwater acidification. In addition, $NO_x$ can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive species. |
| Nitrogen (N) deposition | The pollutants that contribute to nitrogen deposition derive mainly from $NO_X$ and $NH_3$ emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication. | Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost. |
| Ozone ($O_3$) | A secondary pollutant generated by photochemical reactions from $NO_x$ and volatile organic compounds (VOCs). These are mainly released by the combustion of fossil fuels. The increase in combustion of fossil fuels in the UK has led to a large increase in background ozone concentration, leading to an increased number of days when levels across the region are above 40ppb. Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone. | Concentrations of $O_3$ above 40 ppb can be toxic to humans and wildlife, and can affect buildings. Increased ozone concentrations may lead to a reduction in growth of agricultural crops, decreased forest production and altered species composition in semi-natural plant communities. |
| Sulphur Dioxide $SO_2$ | Main sources of $SO_2$ emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total $SO_2$ emissions have decreased substantially in the UK since the 1980s. | Wet and dry deposition of $SO_2$ acidifies soils and freshwater, and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils. |

3.2.3 For the following reasons, only NOx and ammonia are considered further as specific pollutants for the purposes of HRA:

- Despite the general association with nitrogen dioxide, ozone levels are not as high in urban areas (where high levels of nitrogen dioxide are emitted) as in rural areas. This is largely due to the long-range nature of this pollutant, which is sufficiently great that the source of emission and location of deposition often cross national boundaries. As such, low-level ozone can only be practically addressed at the national and international level.
- Although methane and carbon dioxide are important greenhouse gases, it is not possible to relate quantities of these gases to particular effects on specific European sites. It is therefore not possible to consider these within the scope of this Appropriate Assessment other than by noting that increased emission of these chemicals will contribute at a global scale to accelerating rates of climate change.

- Sulphur dioxide concentrations are overwhelmingly influenced (82% of emissions) by the output of power stations and industrial processes that require the combustion of coal and oil. None of these activities will be associated with developments under the Minerals Local Plan.

3.2.4 Since ammonia is of relevance to European sites primarily through its effect upon nitrogen deposition, it is not considered independently of nitrogen deposition in this assessment. Since NOx can be directly toxic to plants, it is considered separately from its influence on nitrogen deposition in this assessment.

3.2.5 Dust impacts also need consideration, but cannot be quantified beyond broad potential dispersal distances for different particle sizes.

### Oxides of nitrogen and nitrogen deposition

3.2.6 According to the World Health Organisation, the critical NOx concentration (critical threshold) for the protection of vegetation is 30 $\mu gm^{-3}$; the threshold for sulphur dioxide is 20 $\mu gm^{-3}$. In addition, ecological studies have determined 'critical loads' of atmospheric nitrogen deposition (that is, NOx combined with ammonia $NH_3$) for key habitats within the European sites considered within this assessment (Table 4.). It can be seen that Epping Forest SAC is the key site of concern in the county with regard to air quality, as it currently exceeds its critical load for nitrogen deposition by a large margin and also has a NOx concentration above the critical level. The Lee Valley SPA also has NOx concentration that exceeds the critical level but in this case the interest features of the site (wintering gadwall, shoveler and bittern) rely more on the open water and marginal vegetation and the botanical composition of the grassland is likely to have little effect on their use of the site.

**Table 3. Critical nitrogen loads, actual rates of nitrogen deposition and NOx concentrations[5] for the twenty-five European sites considered within this assessment (APIS[6] data accessed on 27/09/12)**

| Site | Grid reference[7] | Key habitats | Minimum[8] critical loads (Kg N/ha/yr) | Actual nitrogen deposition[9] | Actual NOx concentration ($\mu gm^{3}$) |
|---|---|---|---|---|---|
| Essex Estuaries SAC | TM033019 | Saltmarsh<br>Estuaries and flats | 20<br>NA | 14.1 | 15.8 |
| Benfleet and Southend Marshes SPA and Ramsar | TQ877844 | Saltmarsh<br>Estuaries and flats | 20<br>NA | 12.3 | 25.2 |
| Dengie SPA and Ramsar | TM033019 | Saltmarsh<br>Estuaries and flats | 20<br>NA | 14.1 | 15.8 |
| Foulness SPA and Ramsar | TR022912 | Saltmarsh<br>Estuaries and flats | 20<br>NA | 13.2 | 16.2 |
| Crouch and Roach Estuaries SPA and Ramsar | TQ900962 | Saltmarsh<br>Estuaries and flats | 20<br>NA | 18.6 | 18.3 |

[5] As $NO_2$
[6] UK Air Pollution Information System. http://www.apis.ac.uk
[7] For sites outside Essex, grid references relate to the closest points to the District. For all others, a central grid reference has been used.
[8] APIS provides a critical load range – on a precautionary basis, this assessment uses the lowest figure in that range
[9] To a resolution of 5 km

| Site | Grid reference[7] | Key habitats | Minimum[8] critical loads (Kg N/ha/yr) | Actual nitrogen deposition[9] | Actual NOx concentration (µgm $^{3}$) |
|---|---|---|---|---|---|
| | | Open water<br>Improved grassland | NA<br>NA | | |
| Colne Estuary SPA and Ramsar | TM047174 | Saltmarsh<br>Estuaries and flats<br>Neutral grassland | 20<br>NA<br>20 | 15.1 | 16.5 |
| Abberton Reservoir SPA and Ramsar | TL975179 | Open water<br>Improved grassland | NA<br>NA | 16.8 | 16.9 |
| Hamford Water SPA and Ramsar | TM226250 | Saltmarsh<br>Estuaries and flats | 20<br>NA | 14.7 | 17.1 |
| Stour and Orwell Estuaries SPA and Ramsar | TM236334 | Saltmarsh<br>Estuaries and flats<br>Grazing marsh | 20<br>NA<br>30 | 15.3 | 21.2 |
| Lee Valley SPA and Ramsar | TL374028 | Open water<br>Improved grassland<br>Neutral grassland | NA<br>NA<br>20 | 17.2 | 31.2 |
| Blackwater Estuary SPA and Ramsar | TL951076 | Saltmarsh<br>Estuaries and flats<br>Grazing marsh<br>Neutral grassland | 20<br>NA<br>30<br>20 | 13.6 | 16.1 |
| **Epping Forest SAC** | **TQ414973** | **Beech woodland<br>Lowland heathland** | **10<br>20** | **32.2** | **33.7** |
| Thames Estuary and Marshes SPA and Ramsar | TQ798790 | Estuaries and flats<br>Open water<br>Neutral grassland | NA<br>NA<br>20 | 14.1 | 23.2 |
| Outer Thames Estuary pSPA | | Maritime habitats | NA | Not determined | Not determined |

3.2.7 The most acute impacts of NOx take place close to where they are emitted, but individual sources of pollution will also contribute to an increase in the general background levels of pollutants at a wider scale, as small amounts of NOx and other pollutants from the pollution source are dispersed more widely by the prevailing winds.

3.2.8 The main sources of NOx in the UK are[10]:

- Road and other transport (approximately 47%; greater in urban areas);

[10] Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. http://www.airquality.co.uk/archive/index.php

- Public power generation using fossil fuels (22%).
- Combustion in industrial processes (14%).
- Domestic and commercial sources (4%), e.g. commercial boilers in schools, hospitals etc.

3.2.9 Therefore, when considering the ecologically relevant impacts of a Minerals Local Plan, by far the largest contribution to NOx will generally be made by the associated road traffic. It can be seen from the preceding analysis that Epping Forest SAC is the only European site in Essex for which air quality is a significant issue.

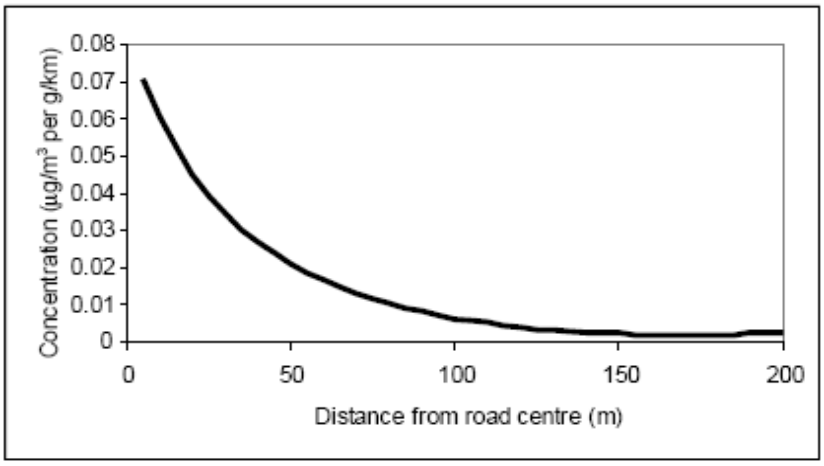
### Transport Exhaust Emissions

3.2.10 The actual scale of heavy vehicle movement associated with minerals facilities is dependent upon the scale of the facility, which cannot be prescribed by the Minerals Local Plan except at the broadest scale. It is therefore impossible to give meaningful "typical" values for minerals sites.

3.2.11 The only general conclusion that can be safely drawn is that all new minerals sites are likely to result in a local increase in vehicle movements. It is also true that the distance vehicles travel may be as important as the numbers or type of vehicle in contributing to deteriorating atmospheric deposition of European sites, if the route leads the traffic within close proximity of multiple European sites.

3.2.12 According to the Department of Transport's Transport Analysis Guidance, "*Beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant*"[11].

**Figure 3 – Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT)**




3.2.13 Given the difficulties in accurately determining and modelling likely scales of vehicle usage on sites for which all parameters must necessarily at this stage be wholly theoretical, it seems more in line with the precautionary principle to utilise the more cautious 200 m figure, rather than smaller figures that may have been derived from site-specific theoretical models. This is therefore the distance that has been used throughout this HRA in order to determine whether European sites are likely to be significantly affected by development under the Minerals Local Plan.

[11] www.webtag.org.uk/archive/feb04/pdf/feb04-333.pdf

3.2.14 There are ten European sites within Essex that lie within 200m of a main road that could theoretically serve as a transport route for minerals traffic; Epping Forest SAC lies within 200m of the M25 and is already adversely affected by poor air quality. The other sites are not currently exceeding their critical levels or critical loads:

- Essex Estuaries SAC lies within 200m of the A132 and A414;
- Crouch and Roach Estuaries SPA/Ramsar lies within 200m of the A132;
- Blackwater Estuary SPA/Ramsar lies within 200m of the A414;
- Lee Valley SPA/Ramsar lies within 200m of the A414; and
- Stour and Orwell Estuaries SPA/Ramsar lies within 200m of the A137 and A120.

3.2.15 Additionally, the Stour and Orwell Estuaries SPA/Ramsar lies within 200m of the A14 in Suffolk. Therefore any plans or policies that involve transport of minerals across county borders could affect these sites through impacts on air quality. In this context, Epping Forest SAC is also vulnerable to any transfer of minerals into or out of Essex from/to London or the South West via the M25 and numerous trunk roads. It is understood from the Minerals Local Plan that the majority of imports and exports are currently by rail or barge.

3.2.16 The Local Transport Plan for Essex (2006-2011) identifies widening of the M25 between junctions 26 and 31 as a major transport initiative, and this scheme is currently under development. Although the scheme has potential to allow increased capacity on the M25 (including the section between Junctions 26 and 27 some of which lies within 200m of Epping Forest), there is also potential for reduced congestion, and therefore improved air quality.

**Diffuse Air Pollution**

3.2.17 In addition to the contribution to local air quality issues, development can also contribute cumulatively to an overall deterioration in background air quality across an entire region. In July 2006, when this issue was raised by Runnymede District Council in the South East, Natural England advised that local authority plans *'can only be concerned with locally emitted and short range locally acting pollutants'* [12] as this is the only scale which falls within a local authority remit. It is understood that this guidance was not intended to set a precedent, but it inevitably does so since (as far as we are aware) it is the only formal guidance that has been issued to a Local Authority from any Natural England office on this issue. In the light of this, diffuse air quality issues will not be considered further within this HRA.

## Quarries and Minerals Operations (Dust)

3.2.18 Atmospheric pollutants generated by minerals sites generally resolve themselves into dust and traffic exhaust emissions. Vehicle exhaust emissions have already been discussed. Effects of dust on European wildlife sites and vegetation will depend on the prevailing wind direction and the transport distance is related to particle size; large particles (>30µm) will mostly deposit within 100m of the source, intermediate particles (10-30µm) are likely to travel up to 200 - 500m. Smaller particles (<10µm) can travel up to 1km from the source[13], but are not associated with sand and gravel quarries (the principle quarrying activities in Essex). With regard to the

[12] English Nature (16 May 2006) letter to Runnymede Borough Council, 'Conservation (Natural Habitats &c.) Regulations 1994, Runnymede Borough Council Local Development Framework'.
[13] Scottish Environment Protection Agency. 2003. Technical Guidance Note - Habitats Regulations & The Landfill Regulations Guidance
http://www.sepa.org.uk/pdf/guidance/landfill_directive/habitats_landfill_regulations_guidance.pdf

interest features of European sites, it is likely to be the large and intermediate size particles that are of most interest since if present in sufficient quantities they can smother vegetation, preventing light penetration to the chloroplasts and blocking stomata thus interrupting photosynthesis and transpiration. In prolonged cases, death can result.

3.2.19 Dust impacts will be considered further in this assessment, but cannot be quantified beyond the broad potential distances identified above for different particle sizes. For the purposes of screening, those minerals sites that lie more than 500m from a European site have been 'screened out' as being unlikely to contribute significant dust impacts.

### Background Trends

**Epping Forest SAC**

3.2.20 Table 3 indicates that nitrogen deposition is already a problem within Epping Forest SAC.

3.2.21 It should also be noted that all of the figures provided by APIS are background values modelled at 1km$^2$ resolution or lower, and do not reflect the much higher pollution levels/loads which can be present within 200m of the roadside – according to Natural England, roadside NOx levels at the Wake Arms Roundabout are believed to be in excess of 100µgm$^{-3}$.

3.2.22 According to the APIS website, fully 20% of nitrogen currently deposited within Epping Forest derives from road transport exhaust emissions. It should be noted that Natural England commented when recently consulted on the HRA Scoping Report for the Hertfordshire Local Transport Plan that in their opinion 20% is likely to be a considerable underestimate. Other evidence, has suggested that the ratio between background pollution and that which is locally traffic-derived varies considerably across the Forest, but that the contribution from traffic (including that from $NH_3$) may be as much as 50% of the total. In addition, the background pollution, which is mostly derived from London, will also include a proportion which is derived from traffic. This proportion is unknown, but data in the GLA's Air Quality Strategy suggests that it may be as high as 50% of the background pollution. Therefore, the overall contribution from road traffic may potentially be in the order of 60-75% of the total[14].

## 3.3 Water Quality, Levels and Flows

3.3.1 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:

- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour.
- Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment,

[14] Letter from Natural England (Gordon Wyatt) to URS Ltd (James Riley) following consultation as part of the scoping exercise to inform the HRA of the Hertfordshire Local Transport Plan (2010)

nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen.

- Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life.

3.3.2 There are several ways in which quarrying / mining can affect water quality/resources:

- Quarries and mines that are below the water table will require dewatering on a regular basis. Dewatering can lead to a reduction in the water table and "draw down" from hydraulically linked groundwater dependent habitats (including streams and rivers);
- The physical presence of a new quarry in the unsaturated zone (i.e. above the water table) can increase the possibility of aquifer contamination and result in a direct reduction in temporary groundwater storage capacity;
- If the water that is pumped from a quarry as a result of dewatering has a high proportion of clays and suspended particles, or is contaminated with metals, it can reduce water quality within those watercourses that receive the water; and
- Backfilling quarry voidspace with overburden or imported fill may cause changes to groundwater levels, quality and flow paths in adjoining areas.

## Background Trends

3.3.3 With the exception of Epping Forest SAC, all of the European sites assessed within Essex are sensitive to waterborne pollution. The Outer Thames Estuary pSPA and the Thames Estuary SPA and Ramsar sites are also sensitive.

3.3.4 Water flows and water availability are important determinants of the favourable condition of all sites within Essex apart from Epping Forest SAC, but are unlikely to be a concern at Hamford Water SPA/Ramsar (where freshwater inputs are not regarded as a key environmental feature). Outside of Essex, freshwater flows are of importance to the Thames Estuary SPA and Ramsar site.

3.3.5 The majority of water supply within Essex is delivered by Essex and Suffolk Water (ESW), via storage facilities at Abberton and Hanningfield reservoirs. Other water supply companies that operate in Essex are Anglian Water, whose WRZ10 covers Braintree and Colchester districts[15] and Veolia Water East, who supply Tendring district, mostly from groundwater underlying the Rivers Stour and Brett, with the remainder from the River Colne, via shared storage facilities with Anglian Water[16]. Anglian Water is responsible for waste water and sewage treatment in Essex region.

3.3.6 Environment Agency Catchment Abstraction Management Strategies (CAMS) that define water availability relevant to Essex cover:

- Roding, Beam and Ingrebourne
- Combined Essex

[15] Anglian Water. Water Rersource Management Plan 2010-2035. http://www.anglianwater.co.uk/_assets/media/AW_WRMP_2010_main_Report.pdf
[16] Veolia Water East. Water Resource Management Plan 2010-2035. http://www.veoliawater.co.uk/lib/vwuk/tendring-hundred/4621,VWE-Final-WRMP.pdf

- Cam and Ely

3.3.7 The CAMS are split into smaller Water Resource Management Units (WRMUs), each of which may be defined as 'water available', 'no water available', 'over-licenced' or 'over abstracted.' Such designations can also be combined where appropriate to give an overall integrated rating. Within Essex, only three WRMUs have water available – these are the Upper Roach, Crouch and Mardyke rivers, the rivers Roding (lower), Beam and Ingrebourne and the chalk aquifer beneath the latter catchment.

3.3.8 ESW has previously undertaken desk studies and some investigations to assess the potential for development of new abstractions from the River Roding and the Chalk aquifer of the southwest extremity of the Essex supply area. No resource development is possible within these catchments, largely due to reasons of poor water quality combined with relatively small quantities available which would make any resource development immediately uneconomic.

## 3.4 Disturbance

3.4.1 Quarrying and mining share many noise and visual disturbance issues (e.g. heavy vehicle movements and loud machinery) with other industrial operations.

3.4.2 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding. Disturbance therefore risks increasing energetic output while reducing energetic input, which can adversely affect the 'condition' and ultimately survival of the birds In addition, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they have to sustain a greater number of birds. Moreover, if a breeding bird is displaced from the nest for a long period, the eggs are likely to cool and become more vulnerable to predators.

3.4.3 Human activity can affect birds either directly (e.g. through causing them to flee) or indirectly (e.g. through damaging their habitat). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to behavioural changes (e.g. alterations in feeding behaviour, avoidance of certain areas etc.) and physiological changes (e.g. an increase in heart rate) that, although less noticeable, may ultimately result in major population-level effects by altering the balance between immigration/birth and emigration/death.

3.4.4 The degree of impact that varying levels of noise will have on different species of bird is poorly understood except that a number of studies have found that an increase in traffic levels on roads does lead to a reduction in the bird abundance within adjacent hedgerows - Reijnen et al (1995) examined the distribution of 43 passerine species (i.e. 'songbirds'), of which 60% had a lower density closer to the roadside than further away. By controlling vehicle usage they also found that the density generally was lower along busier roads than quieter roads.

3.4.5 Activity will often result in a flight response (flying, diving, swimming or running) from the animal that is being disturbed. This carries an energetic cost that requires a greater food intake. Relatively little detailed research has been conducted concerning the energetic cost to wildlife of disturbance, but such evidence as exists indicates a significant negative effect.

3.4.6 Twenty European sites in Essex (SPAs and Ramsars) have been designated at least in part for their bird interest:

- Abberton Reservoir SPA and Ramsar;
- Benfleet and Southend Marshes SPA and Ramsar;
- Blackwater Estuary SPA and Ramsar;
- Colne Estuary SPA and Ramsar;
- Crouch and Roach Estuaries SPA and Ramsar;
- Dengie SPA and Ramsar;
- Foulness SPA and Ramsar;
- Hamford Water SPA and Ramsar;
- Lee Valley SPA and Ramsar; and
- Stour and Orwell Estuaries SPA and Ramsar

3.4.7 Both the Outer Thames Estuary pSPA and the Thames Estuary and Marshes SPA/Ramsar are also designated for their bird interest. Several of these sites are currently affected by disturbance and others may be. In many cases these issues result from recreational pressure or shipping activities (and in some cases aircraft and military activity); however, the implication is that further development (such as minerals sites) could exacerbate any existing concerns.

- Benfleet & Southend Marshes - The SPA/Ramsar does currently attract some disturbance issues, as highlighted in the most recent condition assessment of the SSSI by Natural England. The majority of the SSSI is reported as having a favourable condition, however 26% is recorded as either 'unfavourable no change' or 'unfavourable declining'. One of the reasons given for this is public access to both onshore and offshore areas.
- Stour and Orwell Estuaries - A three year study of wetland birds at the Stour and Orwell SPA found that walkers, boats and dogs were the most regular source of disturbance. Despite this, the greatest responses came from relatively infrequent events, such as gun shots and aircraft noise. Birds seemed to habituate to frequent 'benign' events such as vehicles, sailing and horses, but there was evidence that apparent habituation to more disruptive events related to reduced bird numbers – i.e. birds were avoiding the most frequently disturbed areas. Disturbance was greatest at high tide and on the Orwell, but birds on the Stour showed greatest sensitivity[17]. Increased port activity and coastal shipping movements could interact with land-based development to create disturbance issues to birds for which coastal SPA and Ramsar sites have been designated. Since 2005, consents have been granted for a number of container port developments which, if completed as planned, would provide substantial additional container throughput. estimated 1.7 million teu (twenty-foot equivalent units).
- Colne Estuary - A recent British Trust for Ornithology Wetland Bird Survey report on this site notes that potential threats to this SPA and surrounding areas are posed by '*disturbance caused by air activities such as paragliding… deliberate goose scaring on adjacent farmland and recreational disturbance*'[18].

[17] Ravenscroft, N. (2005) *Pilot study into disturbance of waders and wildfowl on the Stour-Orwell SPA: analysis of 2004/05 data*. Era report 44, Report to Suffolk Coast & Heaths Unit.
[18] http://www.bto.org/webs/news/AR07_08/WITUK0708_section12.pdf

## 3.5 Landtake and Off-site Disturbance

3.5.1 Land take from within European designated sites, except under exceptional circumstances, would not be permitted, but in many cases land beyond the geographical boundary of such sites is also of integral value to the species for which the site is designated. Examples include off-site feeding and roosting areas for birds that are designated features of SPAs.

3.5.2 For the purposes of screening we have used the precautionary distance of 1km as a basis on which to screen minerals sites in or out of consideration with regard to the potential for disturbance (i.e. noise and visual) impacts.

### Background trends

3.5.3 Within Essex no European designated sites are currently considered to be showing adverse condition as a result of land take beyond the site boundaries.

3.5.4 However, a number of species for which the SPAs and Ramsar sites within Essex are designated are likely to use habitats that exist in areas immediately surrounding them, in particular:

- Farmland habitats – ploughed fields and pasture provide roosting and feeding opportunities for species such as golden plover, grazing marshes support many waterfowl species and raptors, and dark-bellied brent geese forage on winter cereals; and
- High tides roosts – when SPA/Ramsar habitats are inundated, species may move to suitable off-site areas for roosting

## 3.6 Coastal Squeeze

3.6.1 Rising sea levels can be expected to cause intertidal habitats (principally saltmarsh and mudflats) to migrate landwards. However, in built-up areas, such landward retreat is often rendered impossible due the presence of the sea wall and other flood defences.

3.6.2 In addition, development frequently takes place immediately behind the sea wall, so that the flood defences cannot be moved landwards to accommodate managed retreat of threatened habitats. The net result of this is that the quantity of saltmarsh and mudflat adjacent to built-up areas will progressively decrease as sea levels rise. This process is known as ‘coastal squeeze’. In areas where sediment availability is reduced, the 'squeeze' also includes an increasingly steep beach profile and foreshortening of the seaward zones.

3.6.3 Minerals sites can contribute to coastal squeeze as much as any other development by restricting opportunities for managing realignment. This impact is relevant to virtually the whole of the Essex coastline, which is either already designated or is the subject of a pSPA.

3.6.4 The Shoreline Management Plan for Essex and South Suffolk is currently out for consultation. The Essex CHaMP (2002)[19] provides a long-term strategic view on how the balance of losses and gains to habitats and species of European interest (particularly intertidal and freshwater habitats in the coastal zone) can be maintained in the light of rising sea levels, and the flood defence response to it. The CHaMP concluded that the estuaries cannot be maintained in their present form. Maintaining the present levels of flood defences will lead to the loss of significant

[19] http://www.eclife.naturalengland.org.uk/

areas of salt marsh by 2050. It was recognised that ecological change is inevitable due to changes in the distribution and extent of habitats under a sea level rise scenario.

3.6.5 The following sites in Essex are currently suffering from, or potentially threatened by coastal squeeze and coastal erosion:

- Benfleet and Southend Marshes - Evidence indicates the saltmarsh is still decreasing in extent at a significant rate and the draft Thames Estuary CHaMP (2008) indicates this trend will continue. The saltmarsh is subject to coastal squeeze - which is being addressed strategically through CHAMPs/SMPs/TE2100 project and other national policy interventions.
- Blackwater Estuary - The saltmarsh is eroding and degrading, and the intertidal foreshore is subject to coastal squeeze.
- Colne Estuary - The saltmarsh is eroding and degrading, and the intertidal foreshore is subject to coastal squeeze.
- Crouch and Roach Estuaries - The saltmarsh is eroding and degrading, and the intertidal foreshore is subject to coastal squeeze.
- Dengie - Saltmarsh erosion is occurring on parts of the site.
- Essex Estuaries - Saltmarsh erosion and intertidal coastal squeeze are affecting many areas of the SAC.
- Hamford Water - Saltmarsh erosion is occurring on parts of the site.
- Stour and Orwell Estuaries - Saltmarsh erosion is occurring on parts of the site.

## 3.7 Defining Distances for Assessment of Pathways of Impact

3.7.1 In performing the HRA, the following distances, based on guidance from Natural England and/or the Environment Agency have been used for each source of impact.

**Table 4 – Screening distances used for each source of impact**

| Pathway | Screening distance |
|---|---|
| Air quality – vehicle exhaust emissions | 200m from European site |
| Air quality - dust | 500m from European site |
| Water quality | No standard distance – use Source/Pathway/Receptor approach |
| Water Resources | No standard distance – use Source/Pathway/Receptor approach |
| Disturbance (noise/visual) | 1km from European site supporting disturbance sensitive species/populations |
| Coastal squeeze | No standard distance – evaluate on case by case basis |

# 4 Likely Significant Effects

## 4.1 Introduction

4.1.1 This Chapter sets out the Habitat Regulations Assessment of the Minerals Local Plan. It is organised into two sections: Preferred Sites and Draft Policies.

## 4.2 Preferred Sites

4.2.1 The results of the appraisal of each Preferred Site are detailed in the table below. Note that the 'existing sites' listed in Table 5 of Chapter 7 of the Plan have not been assessed below because these are existing operational sites for which the Plan does not make any particular proposals in terms of changing their area, duration or other conditions of use, but references them only for information. Minerals from these sites will of course form part of the overall resource on which the Plan relies but they are already in existence irrespective of the Local Plan or its policies; they cannot therefore be considered to be a result of delivery of the Local Plan.

4.2.2 All sites were included within the previous iterations of HRA work at Preferred Approach (2010) or during theMDD Site allocations – Issues and Options paper (August 2011). The conclusions of those two assessments are given below.

| Site reference | Site name | Conclusions of 2010 Preferred Approach HRA | Conclusions of 2011 Site Allocations Issues and Options paper HRA |
|---|---|---|---|
| A3 – A7 | Bradwell Quarry, Rivenhall | A series of proposed extensions to an existing quarry. Mineral traffic would use the existing main site access, and HGV movements would be restricted in line with current levels of working. Site is approximately 9km from the nearest European site (Abberton Reservoir SPA); there is no pathway of impact connecting the quarry extensions to this SPA. **No likely significant effect** | No change. Conclusion as per 2010 HRA. No new issues raised |
| A9 | Broadfield Farm, Rayne | New quarry. Site is approximately 20km from the nearest European site (Blackwater Estuary SPA/Ramsar site); there is no pathway connecting the quarry to this SPA. **No likely significant effect** | No change. Conclusion as per 2010 HRA. No new issues raised |
| A13 | Colchester Quarry, Fiveways | Extension of existing quarry. Site is close to the Roman River that supplies some input to Abberton Reservoir. However, there is unlikely to be a significant effect on the | No change. Conclusion as per 2010 HRA. No new issues raised |

| Site reference | Site name | Conclusions of 2010 Preferred Approach HRA | Conclusions of 2011 Site Allocations Issues and Options paper HRA |
|---|---|---|---|
| | | overall water supply, which already has various control mechanisms. Water quality impacts are unlikely, especially given that the site is around 7km from the reservoir. The site is over 10km from the next nearest European site (Colne Estuary SPA), so no significant effects are likely on that site. **No likely significant effects** | |
| A20 | Sunnymead, Alresford | Not assessed | Extension to an existing quarry. Site is between 1.5km and 2.5km from the nearest European site (Colne Estuary SPA/Essex Estuaries SAC). There is no blasting associated with minerals extraction at this site. There are no identified pathways of impact. **No likely significant effects.** |
| A22 and A23 | Little Bullocks Farm, Little Canfield | The two sites are extensions to an existing quarry. Site is over 10km from the nearest European site. **No likely significant effect** | No change. Conclusion as per 2010 HRA. No new issues raised |
| A31 | Maldon Road, Birch | Extension to an existing quarry. Site is approximately 2.5km from Abberton Reservoir SPA. There will be no blasting associated with minerals extraction at this site. There are no impact pathways linking the site to Abberton Reservoir SPA. **No likely significant effect** | No change. Conclusion as per 2010 HRA. No new issues raised |
| A38 and A39 | Blackleys Quarry, Great Leighs | Extensions to an existing quarry. Site is over 10km from the nearest European site (Blackwater Estuary SPA/Ramsar site and Essex Estuaries SAC). No impact pathways identified. **No likely significant effect** | No change. Conclusion as per 2010 HRA. No new issues raised |
| A40 | Land at Shellows Cross Farm, Willingale / Roxwell | Site is over 20km from the nearest European site (Essex Estuaries SAC). **No likely significant effect** | No change. Conclusion as per 2010 HRA. No new issues raised |
| A46 | Land at Coleman's Farm, Witham | Part of the quarry extension red line boundary given in the Minerals Local Plan is within 50m of the River Blackwater | Appendix 7 of the Submission Local Plan sets out the requirements that each site must meet. As part |

| Site reference | Site name | Conclusions of 2010 Preferred Approach HRA | Conclusions of 2011 Site Allocations Issues and Options paper HRA |
|---|---|---|---|
| | | which is a tributary of the Blackwater Estuary SPA/Ramsar site approximately 8.5km downstream. It is however noted that this does not mean that minerals extraction will take place up to the red line. Safeguards in the Local Plan are however required to secure further investigation before this site proceeds. | of the requirements for site A46 is the need to undertake site-specific Appropriate Assessment for any planning application before the proposals for works can proceed. This will be needed in order to confirm that there will be no impact on flows within the River Blackwater or on water quality within the River. Appendix 7 also states that a full hydrological and hydrogeological assessment will be required before planning permission is granted. It is considered that the requirement to undertake these studies provides sufficient safeguards to protect the River Blackwater that a likely significant effect on the Blackwater Estuary SPA/Ramsar site downstream can be avoided. Therefore the conclusion reached is **'no likely significant effect' provided the requirements of Appendix 7 are complied with.** |
| B1 | Slough Farm, Martells | Site is 6.5km from the nearest European site (Stour & Orwell Estuaries SPA/Ramsar site). No impact pathways identified. **No likely significant effect** | No change. Conclusion as per 2010 HRA. No new issues raised |

4.2.3 It can be seen from the preceding assessment that none of the 'new' Preferred minerals Sites that the Minerals Local Plan intends to allocate are likely to have a significant effect on any European site. Since in all cases this is because no impact pathway exists linking any of these sites to any European sites there is no mechanism for a likely significant effect 'in combination' with other projects and plans either.

## 4.3 Draft Policies

4.3.1 The results of the policy appraisal exercise are detailed in the table below.

| Policy | Details | Screening decision |
|---|---|---|
| Policy S1 Presumption in Favour of Sustainable Development | The Minerals Planning Authority will take a positive approach to minerals development that reflects the presumption in favour of sustainable development contained in the National Planning Policy Framework. It will work proactively with applicants to find solutions which mean that proposals can be approved wherever possible, and to secure minerals development that improves the economic, social and environmental conditions in the area.<br><br>Planning applications that accord with the site allocations and policies in this Local Plan will be approved without delay, unless material considerations indicate otherwise.<br><br>Where there are no policies relevant to the application or relevant policies are demonstrably out-of-date at the time of making the decision, the Minerals Planning Authority will grant permission unless material conditions indicate otherwise – taking into account whether:<br><br>• Any adverse impacts of granting planning permission would significantly and demonstrably outweigh the benefits, when assessed against the policies in the National Planning Policy Framework taken as a whole; or<br><br>• Specific policies in the National Planning Policy Framework indicate that development should be restricted. | The National Planning Policy Framework explicitly excludes development that would have an adverse effect on European sites from the 'presumption in favour of sustainable development'. Therefore, this policy will not result in a likely significant effect on any European site. |
| Policy S2 Strategic Priorities for Minerals Development | The strategic priorities for minerals development are focused primarily on meeting the mineral supply needs of Essex whilst achieving sustainable development. The | There is no mechanism for the strategic priorities set out in this policy to lead to a likely significant effect on any European sites. |

| Policy | Details | Screening decision |
|---|---|---|
| | strategy will promote this by:<br><br>1. Ensuring minerals development makes a contribution towards reducing greenhouse gas emissions, is resilient and can demonstrate adaptation to the impacts of climatic change,<br><br>2. Ensuring there are no significant adverse impacts arising from proposed minerals development for public health and safety, amenity, quality of life of nearby communities, and the environment,<br><br>3. Reducing the quantity of minerals used and waste generated through appropriate design and procurement, good practices and encouraging the re-use and the recycling of construction materials containing minerals,<br><br>4. Improving access to, and the quality and quantity of recycled/ secondary aggregates, by developing and safeguarding a well distributed County-wide network of strategic and non-strategic aggregate recycling sites,<br><br>5. Safeguarding mineral resources of national and local importance, mineral transhipment sites, Strategic Aggregate Recycling facilities and coated roadstone plants, so that non-minerals development does not sterilise or compromise mineral resources and mineral supply facilities,<br><br>6. Making planned provision through Preferred Site allocations for a steady and adequate supply of aggregates and industrial minerals to meet identified national and local mineral needs in Essex during the plan-period whilst maintaining landbanks at appropriate levels,<br><br>7.Providing for the best possible geographic dispersal of sand and gravel across the County to support key areas of growth and development, infrastructure projects and to | The Preferred Sites mentioned in point (6) have already been evaluated and it has been identified that there will be no likely significant effect from these sites.<br><br>Point (5) refers to a range of transhipment and roadstone sites, which are discussed in more detail in Policy S7. However, these are existing sites that are only identified in the Plan for safeguarding (i.e. avoiding other types of development that would 'sterilise' their minerals use) rather than being actively promoted for further expansion or development. |

| Policy | Details | Screening decision |
|---|---|---|
| | minimise mineral miles,<br><br>8.Ensuring progressive phased working and the high quality restoration of mineral extraction developments so as to:<br><br>a) significantly reduce reliance upon the use of landfill materials and,<br><br>b) provide beneficial after-use(s) that secure long lasting community and environmental benefits, including biodiversity, and,<br><br>c) protect the best and most versatile agricultural land.<br><br>9. Maintaining and safeguarding transhipment sites within the County to provide appropriate facilities for the importation and exportation of minerals.<br><br>. | |
| Policy S3 Climate Change | Applications for minerals development shall demonstrate how they have incorporated effective measures to minimise greenhouse gas emissions and to ensure effective adaptation and resilience to future climatic changes, having regard to:<br><br>1. Siting, location, design and transport arrangements,<br><br>2. On-site renewable and low carbon energy generation, where feasible and viable,<br><br>3. National and local principles/ design standards for Sustainable Drainage Systems, including measures to enhance on-site water efficiency and minimise flood impacts both on-site and in relation to adjacent land and | There is no pathway of impact for this policy to lead to likely significant effects on any European sites. |

| Policy | Details | Screening decision |
|---|---|---|
| | 'downstream' land-uses,<br><br>4. On-site resilience to unexpected climatic events,<br><br>5. The implications of coastal change, where relevant, and,<br><br>6. The potential benefits from site restoration and after-use schemes for biodiversity and habitat creation, flood alleviation, and provision of living carbon sinks. | |
| Policy S4 Reducing the Use of Mineral Resources | All development proposals shall ensure that mineral waste is minimised and that minerals on development/ redevelopment sites are re-used and recycled. This is to ensure both a reduction in the need for primary minerals and the amount of construction, demolition, and excavation wastes going to landfill. This will be supported by joint working with strategic partners to ensure:<br><br>1. The use of best practice in the extraction, processing and transportation of primary minerals to minimise mineral waste,<br><br>2. The application of national and local standards for sustainable design and construction in proposed development,<br><br>3. The application of procurement policies which promote sustainable design and construction in proposed development, and<br><br>4. The maximum possible recovery of minerals from construction, demolition and excavation wastes produced at development or redevelopment sites. This will be promoted by on-site re-use/ recycling, or if not environmentally acceptable to do so, through re-use/ | This policy seeks to reduce waste of minerals and maximise efficiency of minerals usage. Ultimately this is a policy intended to improve sustainability and therefore is likely to have a positive effect on European sites if anything. It is therefore screened out as not leading to a likely significant effect. |

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| | recycling at other nearby aggregate recycling facilities in proximity to the site. | |
| Policy S5 Creating and Safeguarding a Network of Aggregate Recycling Facilities | The increased production and supply of recycled/ secondary aggregates in the County is supported to reduce reliance on land-won and marine-won primary aggregates. The County's existing network of aggregate recycling facilities shall be maintained and expanded wherever appropriate. In addition:<br><br>1. Existing Strategic Aggregate Recycling Sites (SARS) identified on the Policies Map and defined in the map in Appendix 7 will be safeguarded from development that might result in their closure earlier than their permission. There is a general presumption that existing SARS should remain in operation for the life of the permission.<br><br>2. The Local Planning Authority shall consult the Minerals Planning Authority for its views and take them into account before determining development proposals that would compromise the continued operation and potential of an existing SARS.<br><br>3. Proposals for new aggregate recycling facilities, whether non-strategic or in the form of SARS, should be located on the main highway network in proximity to the Key Centres of Basildon, Chelmsford, Colchester, and Harlow. Such proposals shall be permitted in the following preferred locations, provided they do not cause unacceptable highway harm, are environmentally acceptable and in accordance with other policies in the Development Plan for Essex:<br><br>a) on major demolition and construction sites (on a temporary basis); | Increasing usage of secondary (i.e. recycled) aggregate reduces reliance on primary aggregate extraction which is a positive sustainability measure. Aggregate recycling can lead to disturbance effects on Special Protection Areas or Ramsar sites if they are in very close proximity to those sites and depending on local topography and the type of recycling involved (e.g. concrete crushing).<br><br>However, this policy is concerned essentially with safeguarding existing operational aggregate recycling sites rather than promoting their expansion, seeking to extend their operating life beyond their current permitted durations, or seeking any new sites.<br><br>Point (3) however, clearly allows for new aggregate recycling sites to potentially come forward (although they are not being actively sought). Since they are not allocated in the Plan it is not known where these sites might be proposed. However, the policy makes it clear that the criteria behind this point include the stipulation that any proposal must be 'environmentally acceptable'. Clearly one of the main definitions of environmental acceptability will be that the site will not lead to adverse effects on the integrity of European sites, given their high level of legal protection. On this basis therefore, and since the policy is not actively promoting or seeking any new aggregate recycling sites (merely not preventing people from proposing new sites) it is reasonable to conclude that the policy will not lead to a likely significant effect on any European sites. |

| Policy | Details | Screening decision |
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| | b) within permanent waste management sites;<br><br>c) in commercial areas used for general industrial or storage purposes, subject to compatibility with neighbouring land-uses;<br><br>d) on appropriate previously developed land;<br><br>e) on current mineral workings and landfill sites provided the development does not unduly prejudice the agreed restoration timescale for the site and the use ceases prior to the completion of the site; and<br><br>f) within major allocated or permitted development areas (as set out in the Development Plan for Essex). | |
| Policy S6 Provision for Sand and Gravel Extraction | The Mineral Planning Authority shall endeavour to ensure reserves of land won sand and gravel are available, sufficient for at least 7 years extraction or such other period as set out in national policy, taking into account the local annual supply requirement for Essex. This requirement will be periodically assessed.<br><br>The Plan identifies sufficient provision through Preferred Sites allocations (listed in Table 5) until 2029 and will be subject to periodic review to enable the maintenance of at least a seven year landbank.<br><br>Proposals for mineral extraction on non-Preferred Sites will be resisted by the Mineral Planning Authority unless the applicant can demonstrate:<br><br>a) An overriding justification and/ or overriding | The main aspect of this policy is the allocation of Preferred Sites in Table 5 of Chapter 7 of the Plan. These have already been assessed in the preceding table and a conclusion of 'no likely significant effect' has been drawn. The policy does not seek to promote any other sites beyond the Preferred Sites. |

| Policy | Details | Screening decision |
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| | benefit for the proposed extraction, and,<br><br>b) The scale of the extraction is no more than the minimum essential for the key purpose of the proposal, and,<br><br>c) The proposal is environmentally suitable, sustainable, and consistent with the relevant policies set out in the Development Plan. | |
| Policy S7 Provision for Industrial Minerals | Any proposals for industrial minerals in the County will be considered as follows:-<br><br>Silica Sand Extraction:<br><br>Provision is made for a site extension at Martells Quarry, Ardleigh to maintain an appropriate minerals landbank for silica sand of at least ten years during the plan-period as defined in policy P2<br><br>Brick Clay Extraction:<br><br>A minerals landbank of at least 25 years of brick-making clay will be maintained at the following brickworks:-<br><br>• Marks Tey and Bulmer through the extraction of remaining permitted reserves.<br><br>The extracted brick-making clay from Bulmer Brickworks and Marks Tey respectively should be used to support the brickworks in that locality only, as defined on the Policies Map.<br><br>Chalk Extraction: | The Preferred Site extension to Martells Quarry has already been assessed in the preceding table and a conclusion of 'no likely significant effect' drawn.<br><br>Marks Tey and Bulmer both already have planning permission for minerals extraction. Therefore they are utilised in the Plan as a source of necessary mineral reserves but the Plan does not allocate them or seek to alter their existing permissions. In any case, Bulmer is over 10km from the nearest European site and Marks Tey is over 5km from the nearest European site (Abberton Reservoir SPA) and has no impact pathways connecting to it.<br><br>Newport Quarry is an existing operational site and is over 10km from the nearest European site.<br><br>The policy does allow for new industrial mineral extraction sites to potentially come forward (although they are not being actively sought). Since they are not allocated in the Plan it is not known where these sites might be proposed. However, the policy makes it clear that the criteria behind this point include the stipulation that any proposal must be 'environmentally acceptable'. Clearly one of the main definitions of environmental acceptability will be that the site will not lead to adverse effects on the integrity of European sites, given their high level of legal protection. On this basis therefore, |

| Policy | Details | Screening decision |
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| | The small-scale extraction of chalk will only be supported for agricultural and pharmaceutical uses at Newport Quarry as identified within the Policies Map. Extraction of chalk for other uses, such as aggregate, fill material or for engineering will not be supported.<br><br>Proposals for the extraction of industrial minerals on non-Preferred Sites will be permitted where:<br><br>• The reserves comprising the landbank are insufficient and/ or there is some other over-riding justification or benefit for the release of the site, and<br>• The proposal would be environmentally acceptable | and since the policy is not actively promoting or seeking any new industrial mineral sites (merely not preventing people from proposing new sites) it is reasonable to conclude that the policy will not lead to a likely significant effect on any European sites. |
| Policy S8 Safeguarding Mineral Resources and Reserves | By applying Mineral Safeguarding Areas (MSAs) and/ or Mineral Consultation Areas (MCAs), the Mineral Planning Authority will safeguard mineral resources of national and local importance from surface development that would sterilise a significant economic resource or prejudice the effective working of a permitted mineral reserve or Preferred Site allocation within the Minerals Local Plan. The Minerals Planning Authority shall be consulted, and its views taken into account, on proposed developments within MSAs and MCAs except for the excluded development identified in Appendix 9.<br><br>Mineral Safeguarding Areas<br><br>Mineral Safeguarding Areas are designated for mineral deposits of sand and gravel, silica sand, chalk, brickearth and brick clay considered to be of national and local importance, as defined on the MSAs Policies Map in Appendix 10. | This policy is concerned exclusively with safeguarding minerals reserves (i.e. ensuring that they are not 'sterilised' for minerals usage by conflicting development) rather than promoting their extraction in particular locations. As its stated in NPPF there is no presumption that resources defined will be worked. As such, it will not result in a likely significant effect on any European sites. |

| Policy | Details | Screening decision |
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| | The Mineral Planning Authority shall be consulted on:<br><br>a) all planning applications for development on a site located within an MSA that is 5ha or more for sand and gravel, 3ha or more for chalk and greater than 1 dwelling for brickearth or brick clay; and<br><br>b) any land-use policy, proposal or allocation relating to land within an MSA being considered by the Local Planning Authority for possible development as part of preparing a Local Plan (with regard to the above thresholds).<br><br>Non-mineral proposals that exceed these thresholds shall be supported by a minerals resource assessment to establish the existence or otherwise of a mineral resource of economic importance.<br><br>If, in the opinion of the Local Planning Authority, surface development should be permitted, consideration shall be given to the prior extraction of existing minerals.<br><br>Mineral Consultation Areas<br><br>MCAs are designated within and up to an area of 250 metres from each safeguarded permitted minerals development and Preferred Site allocation as shown on the Policies Map and defined on the maps in Appendix 10. The Mineral Planning Authority shall be consulted on:<br><br>a) Any planning application for development on a site located within an MCA except for the excluded development identified in Appendix 9,<br><br>b) Any land-use policy, proposal or allocation relating to land within an MCA that is being considered as part of preparing a Local Plan | |

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| | Proposals which would unnecessarily sterilise mineral resources or conflict with the effective workings of permitted minerals development or Preferred Mineral Site allocation shall be opposed**.** | |
| Policy S9 Safeguarding Mineral Transhipment Sites and Coated Stone Plant | The following mineral facilities identified on the Policies Map are of strategic importance and shall be safeguarded from development which would compromise their continued operation.<br><br>Safeguarded Transhipment Sites:<br><br>a. Chelmsford Rail Depot<br><br>b. Harlow Mill Rail Station<br><br>c. Marks Tey Rail depot<br><br>d. Ballast Quay, Fingringhoe (safeguarding to apply only up to the end of mineral extraction at the nearby Fingringhoe Quarry)<br><br>e. Parkeston Quay East, Harwich (for potential operation)<br><br>Safeguarded Coated Stone Plant:<br><br>f. Suttons Wharf, Rochford<br><br>g. Stanway, Colchester<br><br>h. Wivenhoe Quarry<br><br>i. Bulls Lodge, Chelmsford | This policy is concerned exclusively with safeguarding existing (or, in the case of Parkeston Quay East, future) operational transhipment and roadstone sites (i.e. ensuring that they are not 'sterilised' for minerals usage by conflicting development) rather than promoting the development/expansion of any actual sites or any changes in their existing operating permissions /timescales.<br><br>Ballast Quay Fingringhoe does lie in close proximity to (within 400m upstream of) the Colne Estuary SPA/Ramsar site but the policy is concerned solely with safeguarding the wharf (i.e. ensuring it is not redeveloped for some conflicting purpose) until the end of the operational life of the quarry rather than promoting expansion of operations or duration of operation. Indeed the supporting text explicitly states that '*It would be inappropriate to continue safeguarding of Ballast Quay, Fingringhoe, once extraction at Fingringhoe Quarry is finished*'.<br><br>Suttons Wharf lies approximately 250m from the Essex Estuaries SAC but there is no impact pathway linking them.<br><br>Parkeston Quay is an existing developed quay/wharf immediately adjacent to mudflats that constitute part of the Stour & Orwell Estuaries SPA/Ramsar site. However the wharf itself is entirely land-based and is immediately adjacent to Harwich International Port. As such the area is already very busy with both land and shipping traffic. As discussed above, this policy is concerned only with safeguarding this site against |

| Policy | Details | Screening decision |
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| | j. Essex Regiment Way, Chelmsford<br><br>k. Harlow Mill Rail Station<br><br>The Local Planning Authority shall consult the Mineral Planning Authority and take account of its views before making planning decisions on all developments within 250 metres of the above facilities as defined in the maps in Appendices 8 and 10. Where planning permission is granted for new rail or marine transhipment sites and coated stone plant of strategic importance, those sites will also be safeguarded so that their operation is not compromised. The safeguarding of a strategic plant is for the life of the planning permission or where located in a mineral working, until completion of extraction.<br><br>The Local Planning Authority shall consult the Mineral Planning Authority for its views and take them into account on proposals for development within the Mineral Consultation Area of these safeguarded sites, as identified on the Policies Map, before making planning decisions on such proposals. | conflicting development rather than allocating or promoting it.<br><br>As such, this policy will not result in a likely significant effect on any European sites. |
| Policy S10 Protecting and Enhancing the Environment and Local Amenity | Applications for minerals development shall demonstrate that :<br><br>a) Appropriate consideration has been given to public health and safety, amenity, quality of life of nearby communities, and the natural, built, and historic environment,<br><br>b) Appropriate mitigation measures shall be included in the proposed scheme of development, and<br><br>c) No unacceptable adverse impacts would arise and; | This is a positive development management policy and therefore provides no pathway for a likely significant effect on European sites. |

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| | d) Opportunities have been taken to improve/ enhance the environment and amenity. | |
| Policy S11 Access and Transport | Proposals for minerals development shall be permitted where it is demonstrated that the development would not have unacceptable impacts on the efficiency and effective operation of the highway network, including safety and capacity, local amenity and the environment.<br><br>Proposals for the transportation of minerals by rail and/ or water will be encouraged subject to other policies in this Plan.<br><br>Where transportation by road is proposed, this will be permitted where the highway network is suitable for use by Heavy Goods Vehicles or can be improved to accommodate such vehicles. The following hierarchy of preference for transportation by road shall be applied:<br><br>(i) Access to a suitable existing junction with the main road network, as defined in Section 7, via a suitable section of an existing road, as short as possible, without causing a detrimental impact upon the safety and efficiency of the network .<br><br>(ii) Where (i) above is not feasible, direct access to the main road network involving the construction of a new access/ junction when there is no suitable existing access point or junction,<br><br>(iii). Where access to the main road network in accordance with (i) and (ii) above is not feasible, road access via a suitable existing road prior to gaining access onto the main road network will exceptionally be permitted, having regard to the scale of the development, the capacity of the road and an assessment of the impact on | This is a non-site specific policy. It is generally a positive policy in that it requires minerals development to demonstrate that it would not have an unacceptable environmental impact through impacts on the highway network.<br><br>All of the Preferred Sites (which are the only sites being allocated by the Plan) are sufficiently far from European sites (or have their main highway routes directed away from the European sites) that they are unlikely to add significantly to the transport burden on any roads through European sites. This is particularly the case since the most significant European site in Essex with regard to air quality is Epping Forest SAC which lies on the fringes of the county and a considerable distance from all of the Preferred Sites. Scrutiny of Appendix Eleven of the Plan (Submission Policies Map) indicates clearly that minerals sites are/will be concentrated in a belt from Chelmsford north to Harwich with none in the vicinity of Epping Forest.<br><br>**As a safeguard however, it is recommended that the minerals authority require any proposals for new minerals sites or expanded operations at existing minerals sites to comply with the Department for Transport Design Manual for Roads and Bridges (DMRB) with regard to the criteria that will trigger a specific transport/air quality assessment. The DMRB recommends that any project which is likely to result in an increase of Heavy Duty Vehicle movements within 200m of a designated site of more than 200 Annual Average Daily Traffic (AADT) should undertake specific air quality analysis. This air quality analysis should comply with Environment Agency guidance and determine whether:** |

| Policy | Details | Screening decision |
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| | road safety. | a) **There will be an increase in pollutant concentrations or nitrogen or acid deposition equivalent to more than 1% of the Critical Load/Level for that designated site;**<br>b) **If so, whether the Predicted Environmental Concentration (PEC) will be equivalent to more than 70% of the Critical Level/Critical Load**<br>c) **If both those thresholds are exceeded a more detailed ecological analysis should be carried out to demonstrate that an adverse effect on the integrity of the designated site will nonetheless not result, before planning permission is granted.**<br><br>The Conclusions chapter of this report should be referred to in order to identify how the Minerals Planning Authority has taken this recommendation into account in the Plan. |
| Policy S12 Mineral Site Restoration and After-Use | Proposals for minerals development will be permitted provided that it can be demonstrated that the land is capable of being restored at the earliest opportunity to an acceptable environmental condition and beneficial after-use, with positive benefits to the environment, biodiversity and/or local communities.<br><br>Minerals extraction sites shall:<br>1. be restored using phased, progressive working and restoration techniques<br><br>2. provide biodiversity gain following restoration demonstrating their contribution to priority habitat creation and integration with local ecological networks;<br><br>3. be restored in the following order of preference;<br>(i) at low level with no landfill (including restoration to water bodies) ,<br>(ii) if (i) above is not feasible then at low level but with no | Some minerals site restoration could lead to a likely significant effect depending on the nature of the restoration (e.g. through landfilling) and the location of the site, although the risk (e.g. air quality and disturbance) is generally much lower than for minerals operations themselves. However, this is entirely dependent on the minerals site in question and cannot be assessed in detail at this level. Instead the policy should ensure that there are sufficient safeguards in place to ensure that consideration is given to the potential for likely significant effects before any restoration proposal is approved. In most cases this will be a straightforward exercise. All of the Preferred Sites are located sufficiently far from the nearest European site that there is a very low risk that restoration itself could lead to a likely significant effect on any European sites. Moreover, this policy has recently been amended to include within the list '*adverse effects on the integrity of internationally or nationally important wildlife sites is* |

| Policy | Details | Screening decision |
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| | more landfill than is essential and necessary, to achieve satisfactory restoration.<br>(iii) if neither of these are feasible and the site is a preferred site as may be determined by the Waste Local Plan, then by means of landfill.<br><br>4. provide a scheme of aftercare and maintenance of the restored land for a period of not less than 5 years to ensure the land is capable of sustaining an appropriate after use.<br><br>Where appropriate, proposals shall demonstrate the best available techniques to ensure that:<br>1. Soil resources are retained, conserved and handled appropriately from site preparation, during operations and restoration;<br>2. In the case of minerals development affecting the best and most versatile agricultural land, the land is capable of being restored at least to its former quality if proposed for an agricultural afteruse;<br>3. Hydrological and hydro-geological conditions are preserved and maintained and where appropriate managed to prevent adverse impacts on the adjacent land's groundwater conditions and elsewhere, and;<br>4. Flood risk is not increased;<br>5. Important geological features are maintained and preserved; and<br>6. Adverse effects on the integrity of internationally or nationally important wildlife sites are avoided.<br><br>Proposals shall demonstrate that there will not be an unacceptable adverse impact on groundwater conditions, surface water drainage and the capacity of soils for future use and will have regard to any relevant Surface Water or Shoreline Management Plans. Proposals shall also demonstrate that the working and restoration scheme is appropriate and the implementation and completion of restoration is feasible. | *avoided'.*<br><br>We would also add that the Preferred Site 'Maldon Road, Birch' is approximately 2.5km from Abberton Reservoir SPA. It is understood that the restoration of this site would be to amenity, lakes and agriculture. If, in order to achieve this, any landfilling is considered, it should be inert waste (i.e. not putrescible) as putrescible landfill can (through attracting gulls, crows etc) have an adverse predation effect on sites within 5km that are designated for nesting birds (particularly ground nesting species). Although Abberton Reservoir is primarily designated as an SPA for its wintering and passage waterfowl, it is also designated for supporting over 1% of the UK breeding population of cormorant.<br><br>Equally, 'Sunnymead, Alresford' lies within 2.5km of the Colne Estuary SPA which is partly designated for its breeding population of little tern, a species particularly susceptible to egg/chick predation. If therefore the restoration of this site to agriculture would involve any landfilling, it should also be ensured that putrescible waste is not used. |
| Policy P1 Preferred sites for primary sand and gravel extraction | In the case of preferred sites for sand and gravel extraction the principle of extraction has been accepted | For the assessment of Preferred Sites, refer to the preceding table. |

| Policy | Details | Screening decision |
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| | and the need for the release of mineral proven.<br><br>The Mineral Planning Authority will grant planning permission for sand and gravel workings within the preferred sites, listed in Table 5 (Preferred Sites for Land Won Sand and Gravel Provision) and as shown on the Policies Map , subject to the proposal meeting the detailed development requirements set out in Appendix 5, other relevant policies of the Development Plan for Essex and any other material considerations | |
| Policy P2 Preferred Sites for Industrial Minerals | In the case of Preferred Sites for industrial minerals the principle of extraction has been accepted and the need for the release of mineral proven.<br><br>The Mineral Planning Authority will grant planning permission for industrial minerals workings within the preferred sites, listed in Table 6 (Preferred Site for Silica Sand Provision) and as shown on the Policies Map, subject to the proposal meeting the detailed development requirements set out in Appendix 5, other relevant policies of the Development Plan for Essex and any other material considerations | For the assessment of Preferred Sites, refer to the preceding table. |
| Policy DM1: Development Management Criteria | Proposals for minerals development will be permitted subject to it being demonstrated that the development would not have an unacceptable impact, including cumulative impact with other developments, upon:<br>1. Local amenity (including demonstrating that the impacts of noise levels, air quality and dust emissions, light pollution and vibration are acceptable);<br>2. The health of local residents adjoining the site;<br>3. The quality and quantity of water within water courses, groundwater and surface water;<br>4. Drainage systems;<br>5. The soil resource from the best and most versatile agricultural land;<br>6. Farming, horticulture and forestry<br>7. Aircraft safety due to risk of bird strike;<br>8. The safety and capacity of the highway network;<br>9. Public Open Space, the definitive public rights of way | This policy sets our development management rather than proposing development. As such, it will not lead to a likely significant effect on any European sites. |

| Policy | Details | Screening decision |
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| | network and outdoor recreation facilities;<br>10. The appearance, quality and character of the landscape, countryside and visual environment and any local features that contribute to its local distinctiveness;<br>11.Land stability;<br>12. The natural and geological environment (including biodiversity and ecological conditions for habitats and species);<br>13. The historic environment including heritage and archaeological assets | |
| Policy DM2 Planning Conditions and Legal Conditions | When granting planning permission for minerals developments the Minerals Planning Authority will impose conditions and/or require legal agreements to mitigate and control the effects of the development and to enhance the environment. | This policy sets our development management rather than proposing development. As such, it will not lead to a likely significant effect on any European sites. |
| Policy DM3: Primary Processing Plant | Proposals for minerals extraction will be permitted where the primary processing plant and equipment is located within the limits of the mineral site's boundary and the plant would not have any unacceptable impact on local amenity and/or the surrounding environment.<br><br>Proposals for extension sites shall be expected to include the location of the existing processing plant and access arrangements within the planning application<br><br>Where it is demonstrated that the positioning of the primary processing plant within the boundary of the mineral site is not feasible, the exportation of mineral from the site shall not have an unacceptable impact upon amenity and/or the safety, efficiency and capacity of the highway network.<br><br>Minerals shall only be imported to a minerals site, from non-indigenous sources, when it is demonstrated that there are exceptional circumstances or overriding benefits from doing so.<br><br>In all cases permission will only be granted for a | This is a development management rather than promotion policy which is mainly concerned with ensuring that processing plants will be contained within the limits of the mineral site boundary as far as possible. Since it does not promote or seek to deliver development it will not lead to a likely significant effect on any European sites. |

| Policy | Details | Screening decision |
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| | temporary duration so as not to delay restoration of the site. | |
| Policy DM4: Secondary Processing Plant | Proposals for the secondary processing and/or treatment of minerals will only be permitted at mineral sites where it can be demonstrated that there would be no unacceptable impact upon amenity and/or the local environment and/or the safety, efficiency and capacity of the highway network.<br><br>The minerals for secondary processing and/or treatment shall be sourced from within the boundary of the mineral working within which the plant is located unless it is demonstrated that there are exceptional circumstances or overriding benefits from sourcing materials from elsewhere to supplement indigenous supply, subject to no unacceptable adverse impacts.<br><br>In all cases permission will only be granted for a temporary duration so as not to delay restoration of the site | This is a development management rather than promotion policy which is mainly concerned with ensuring that processing plants not have an adverse effect on the environment or other receptors. Since it does not promote or seek to deliver development it will not lead to a likely significant effect on any European sites. |

## 4.4 Other plans and projects

4.4.1 The key 'other plans and projects' that may come forward and contribute to deteriorating air quality are described below:

- Hertfordshire and London Minerals Plans – there could potentially be effects on air quality from vehicle movements to and from sites in the vicinity of Essex. London has limited supplies of land-won sand and gravel, and currently imports almost a quarter of Essex's primary production. However, as previously discussed the most suitable route for movement of minerals between Essex and London is the M11 or A12, while the most suitable routes for movement between Essex and Hertfordshire are the A10, A414 and A20. There is thus no reason why this would lead to changes in vehicle movements in the vicinity of Epping Forest SAC;
- Essex Waste DPDs – the Essex Minerals Local Plan is being developed in parallel with Waste Local Plan, and there are many shared issues between the two, for example, the transport and re-use of C&D waste. The WDD Preferred Approach 2010 has been subject to a HRA screening exercise, but at this stage specific site allocations and types of facility are not determined. Waste sites may have adverse effects on designated European sites through reduced air quality through proximity and through road transport; and
- Potential housing and other developments within Essex. Prior to notice being given by CLG that the RSS was to be revoked it was undergoing revision as the Draft Revised East of England RSS. This document suggested that over 120,000 new homes would be required by 2031, which could add cumulatively to traffic movements around European sites. Additionally, the consolidated London Plan (2009) indicates that an annual average of 30,500 new dwellings will be provided in London to 2016/17, with 13-24,000 per annum for the ten years thereafter.

4.4.2 However, the contribution of minerals traffic to any traffic is very small (minerals traffic constituting less than 1% of all traffic), the MLP already contains a series of measures to reduce reliance on road transport (and/or reduce the distances travelled) and the likelihood of minerals traffic using roads within 200m of Epping Forest SAC is very low given how far away the site and those routes are located from most minerals sites in Essex.

4.4.3 The key 'other plans and projects' that may come forward and contribute to increased pressure on water resources are described below:

- Suffolk Minerals Plan – there could potentially be similar effects to those listed above on water flows into the Essex Estuaries SAC depending on the location of minerals sites. If the London and Kent Minerals Plans promote usage of the Thames in order to transport minerals, then there is a potential impact from the increased risk of accidental pollution. However, this would be the result of accident and is controlled by the permitting processes associated with barges; and
- Potential housing and other developments within Essex. Prior to notice being given by CLG that the RSS was to be revoked it was undergoing revision as the Draft Revised East of England RSS. This document suggested that over 120,000 new homes would be required in Essex between 2011 and 2031, which could add cumulatively to pressure on water resources. Additionally, the consolidated London Plan (2009) indicates that an annual average of 30,500 new dwellings will be provided in London to 2016/17, with 13-24,000 per annum for the ten years thereafter. Over 50,000 new dwellings are due to be delivered in

Hertfordshire and in Suffolk by 2026. Housing allocations in Hertfordshire in combination with any nearby minerals extraction could create increased pressure on Lee Valley SPA/Ramsar, while those in Suffolk could affect the Stour and Orwell Estuaries SPA/Ramsar. However, in their Water Resource Management Plan (2009), Veolia Water East note that "*the Environment Agency completed the Habitats Directive review of the River Colne abstraction in March 2008 and has concluded that there is no evidence to suggest any detriment to the downstream SPA/SAC*" from the water companies abstraction. As such, no adverse effects should arise from these sources.

4.4.4 However, none of the Preferred Sites or policies within the Essex Minerals Plan would lead to increased water resource pressures.

4.4.5 The key 'other plans and projects' that may come forward and contribute to increased pressure on coastal habitats through coastal squeeze are described below:

- Potential housing and other developments within Essex. Prior to notice being given by CLG that the RSS was to be revoked it was undergoing revision as the Draft Revised East of England RSS. This document suggested that over 120,000 new homes would be required within Essex between 2011 and 2031, which could add cumulatively to pressure on the Essex coast through preventing retreat of coastal habitats; Over 50,000 new dwellings are due to be delivered in Suffolk by 2026. Housing allocations in Suffolk could affect the Stour and Orwell Estuaries SPA/Ramsar.

4.4.6 However, none of the Preferred Sites or policies within the Essex Minerals Plan would lead to coastal squeeze.

4.4.7 The key 'other plans and projects' that may come forward and contribute to increased disturbance are described below:

- Other Minerals Plans – If the London and Kent Minerals Plans promote greater usage of the Thames in order to transport minerals, then potential 'in combination' disturbance effects from this increase in shipping could occur in relation to the quays and harbours that would be used for loading and unloading the barges. However, those minerals policies that are available for review do not indicate that such an increase will take place and while the Port of Harwich (located close to the Stour & Orwell Estuaries SPA/Ramsar site) is identified in as a trans-shipment site in the Minerals Plan it is already a busy international port and the policy currently merely safeguards the facility. While increased minerals movements from this site may or may not occur as minerals distribution shifts from the road, the scale of change will be effectively inconsequential when considered within the context of the existing shipping movements.
- Bathside Bay - Bathside Bay is a major new proposed £300 million container terminal scheme at the Port of Harwich with 1,400 metres of quayside, 11 Ship-to-Shore Gantry Cranes, storage for 52,000 TEUs and capacity for 462,000 TEUs per annum. There is potential for disturbance to birds associated with the Stour & Orwell Estuaries SPA/Ramsar site but the development has been subject to its own EIA and/or Habitat Regulations Assessment.
- Potential housing and other developments within Essex, as described above;;

4.4.8 In summary, it is considered that the Essex Minerals Local Plan will not lead to a likely significant effect in combination with other projects and plans.

# 5 Conclusion

5.1.1 As can be seen from the preceding tables, all Preferred Sites can be screened out as being unlikely to lead to a likely significant effect. All policies can also be screened out as being unlikely to lead to a significant effect. However, two recommendations have been made. The first is with regard to Policy S11 (Access and Transport) which could be included within the supporting text of the Plan. This recommendation concerns air quality impacts from traffic on European sites and is as follows:

5.1.2 The minerals authority should require any proposals for new minerals sites or expanded operations at existing minerals sites to comply with the Department for Transport Design Manual for Roads and Bridges (DMRB) with regard to the criteria that will trigger a specific transport/air quality assessment. The DMRB recommends that any project which is likely to result in an increase of Heavy Duty Vehicle movements within 200m of a designated site of more than 200 per day should undertake specific air quality analysis. This air quality analysis should comply with Environment Agency guidance and determine whether:

- There will be an increase in pollutant concentrations or nitrogen or acid deposition equivalent to more than 1% of the Critical Load/Level for that designated site;
- If so, whether the Predicted Environmental Concentration (PEC) will be equivalent to more than 70% of the Critical Level/Critical Load; and
- If both those thresholds are exceeded a more detailed ecological analysis should be carried out to demonstrate that an adverse effect on the integrity of the designated site will nonetheless not result, before planning permission is granted.

5.1.3 The Preferred Site ‘Maldon Road, Birch’ is approximately 2.5km from Abberton Reservoir SPA. It is understood that the restoration of this site would be to amenity, lakes and agriculture. If, in order to achieve this, any landfilling is considered, it should be inert waste (i.e. not putrescible) as putrescible landfill can (through attracting gulls, crows etc) have an adverse predation effect on sites within 5km that are designated for nesting birds (particularly ground nesting species). Although Abberton Reservoir is primarily designated as an SPA for its wintering and passage waterfowl, it is also designated for supporting over 1% of the UK breeding population of cormorant.

5.1.4 Equally, ‘Sunnymead, Alresford’ lies within 2.5km of the Colne Estuary SPA which is partly designated for its breeding population of little tern, a species particularly susceptible to predation. If therefore the restoration of this site to agriculture would involve any landfilling, it should also be ensured that putrescible waste is not used.

5.1.5 The 2010 HRA of the Preferred Approaches made a series of recommendations for amendments to the Plan. These largely stemmed from the possibility of sites A14/A28 (Tower Field, Ballast Quay) and A16 (Church Farm, Alresford) being selected as Preferred Sites and unresolved issues with regard to those sites concerning water quality/flows and disturbance of SPA birds. However, none of those sites have been selected as Preferred Sites which obviates the need for the Plan to incorporate those recommendations.

## 5.2 Council response to main recommendation

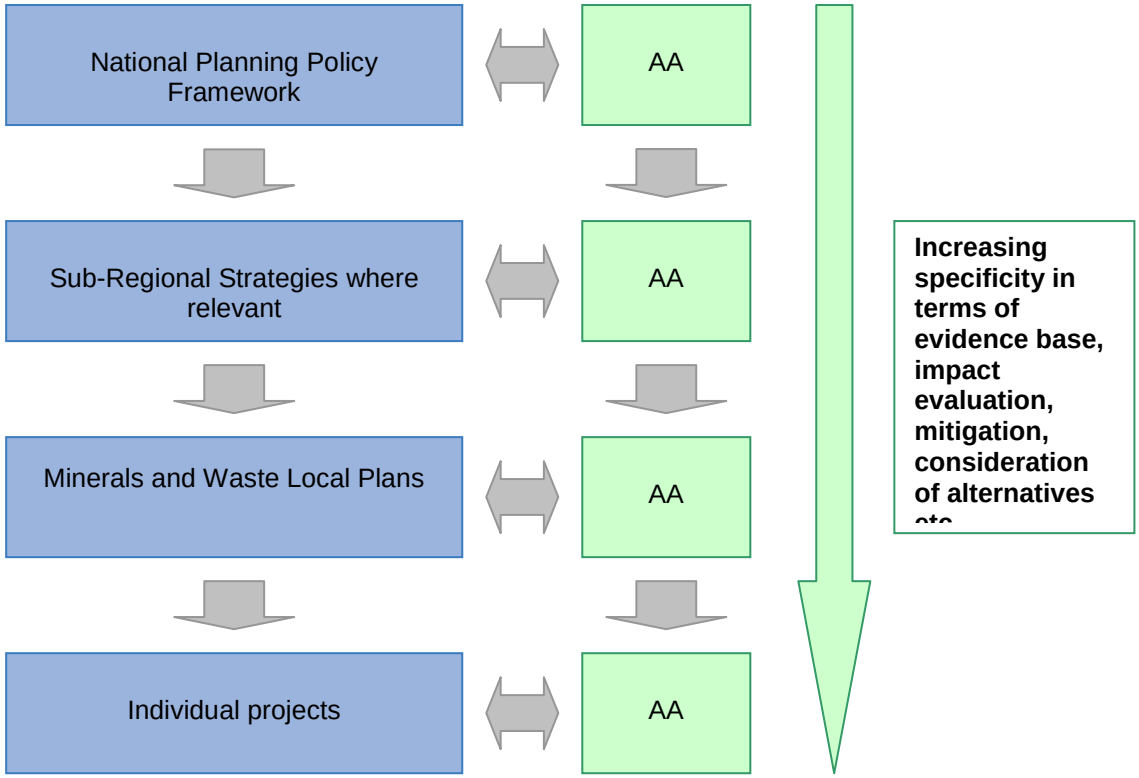
5.2.1 The Council has noted that none of the Preferred Sites are likely to result in an increase of 200 Heavy Duty Vehicle movements per day on any road within 200m of a Natura 2000 site. On this basis, the Council has taken the view that it is not necessary to include extensive text in the Minerals Local Plan covering this matter. However, the Council has included some condensed text relating to this measure as supporting text (paragraph 3.169) to Policy S10: Protecting and Enhancing the Environment and Local Amenity:

*5.2.2* *'Any proposals for mineral development will be expected to show compliance with the Habitat Regulations Assessment. Where a proposal would result in an increase of 200 daily HGV movements within 200m of a Natura 2000 site it will be required to undertake and submit an air quality analysis compliant with Environment Agency guidelines as part of the proposal'.*

*5.2.3* It is accepted that since no actual Preferred Sites would be likely to trigger this requirement it would be excessive to include a large amount of detail in the Minerals Local Plan. As such, the condensed wording that the Council proposes is considered to be sufficient reference to require the need for analysis should any proposals result in a probable increase of over 200 Heavy Duty Vehicle movements per day within 200m of any sensitive European sites.

*5.2.4* With the inclusion of the wording above, it is considered that the Minerals Local Plan would not lead to likely significant effects on any European sites, either alone or in combination with other projects and plans.

# Appendix 1 – "Tiering" in Appropriate Assessment



# Appendix 2 – European designated sites within Essex

## Abberton Reservoir SPA and Ramsar site

Abberton Water is a large storage reservoir (485ha of open water) lying about four miles south of Colchester, and less than five miles from the coast. Most of its supply is pumped from the River Stour, about nine miles to the north. Essex and Suffolk water have recently gained planning approval to expand the capacity (by 58%). The additional water will be otained by varying licences for water transfer from the Ely Ouse (a system which already accounts for up to 35% of supply in dry years).

The reservoir's primary nature interest is as a roost site for the local estuarine population of wildfowl. It is outstandingly important as an autumn arrival point, moulting and wintering locality for wildfowl. At the time of SSSI designation, thirteen species of waterfowl occurred in nationally important numbers, including Wigeon, Mute Swan, Gadwall, Shoveler, Pochard, Tufted Duck, Goldeneye, Goosander and Coot.

A breeding colony of Cormorants nests in trees instead of the customary cliff ledges and rocky inlets. The colony was established in 1981 with 9 nests, and has grown rapidly to almost 500 pairs.

The site boundary includes a strip of pasture and planted woodland surrounding the reservoir. Some of the pastures are damp and unimproved and form feeding areas for Lapwing, Curlew and Golden Plover in winter and nest sites for Yellow Wagtail and Redshank. The improved grassland is extensively grazed by Wigeon, wild and feral geese.

The reservoir is mostly bordered by a concrete apron and access road, but the south-western arm has an inaccessible natural shoreline with willow and reed swamp grading into damp grassland. This provides cover, feeding and breeding habitat for invertebrates, waterfowl and other birds, and provides some additional botanical interest.

### Features of European interest

The site is designated as an SPA for its internationally important populations of:

- Cormorant (breeding)
- Wigeon, gadwall, teal, shoveler, tufted duck, goldeneye, pochard, mute swan, coot and great-crested grebe (wintering)
- An assemblage of almost 40,000 waterfowl (wintering)

The site is designated as a Ramsar for its:

- Assemblage of over-wintering waterfowl
- Spring/Autumn populations of gadwall and shoveler, and over-wintering wigeon

### Key Requirements to Maintain Site Integrity

- Lack of disturbance during winter months (October to March).
- Area of open water.
- Area of shallow water (<30cm) for feeding.

- Presence and abundance of aquatic plant food (e.g. sweet-grass and pondweeds).
- Presence and abundance of aquatic invertebrate food.
- Adjacent grassland nearby used for loafing.
- Absence of nutrient enrichment.
- Absence of non-native species.
- Balance of saline and non-saline conditions

**Benfleet and Southend Marshes SPA and Ramsar site**

Benfleet and Southend Marshes comprise an extensive series of salt marshes, mudflats, scrub and grassland which support a diverse flora and fauna. The south-facing slopes of the downs represent the line of former river cliffs with several re-entrant valleys. At their foot lies reclaimed marshland, with its associated dyke system, based on alluvium. Outside the sea walls there are extensive salt marshes and mud-flats, on which wintering wildfowl and waders reach both nationally and internationally important numbers. Nationally uncommon plants occur in all of the habitats and parts of the area are of outstanding importance for scarce invertebrates.

The grassland of the downs is dominated by a mixture of red fescue, cock's-foot, false oat-grass and bent-grasses which is typical of neutral to acidic conditions. The uncommon bithynian vetch occurs here, together with hartwort, at its only British station, hairy vetchling and slender tare.

The reclaimed marsh is grazed by cattle and horses. It is dominated by grasses such as meadow foxtail and perennial rye-grass. The ponds and dykes exhibit a transition between fresh and brackish water and support a wide range of plant and animal species. The dykes are dominated by sea club-rush, sweet-grasses, duckweeds, mare's-tail and hornworts The great crested newt and scarce emerald damselfly are also present.

The sea wall is dominated by sea couch; uncommon species also present include sea barley and red goosefoot. The salt marsh includes the scarce laxflowered sea-lavender. The mud-flats are colonised by eel-grasses, which, together with dense patches of Enteromorpha and the rich invertebrate fauna within the mud, provide food for thousands of birds which overwinter on this shoreline. Three species (dark-bellied brent goose, grey plover and knot) occur in internationally important numbers whilst three species, (dunlin, redshank and ringed plover), are present at nationally important levels.

**Features of European interest**

The site is designated as an SPA for its internationally important populations of:

- Dark-bellied brent geese, dunlin, knot, ringed plover and grey plover (wintering)
- An assemblage of almost 35,000 waterfowl (wintering)

The site is designated as a Ramsar for its:

- Assemblage of over-wintering waterfowl
- Spring/Autumn populations ofdark-bellied brent geese, and over-wintering knot and grey plover

**Key Requirements to Maintain Site Integrity**

- Minimal disturbance
- Maintenance of grazing / mowing regimes
- Freshwater inputs are of value for providing a localised increase in prey biomass for certain bird species, specific microclimatic conditions and are used for preening and drinking.
- Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze.
- Absence of nutrient enrichment.
- Absence of non-native species.
- Balance of saline and non-saline conditions

## Epping Forest SAC

Epping Forest SAC is located approximately 5km south of Harlow district. 70% of the 1,600 hectare site consists of broadleaved deciduous woodland, and it is one of only a few remaining large-scale examples of ancient wood-pasture in lowland Britain. Epping Forest supports a nationally outstanding assemblage of invertebrates, a major amphibian interest and an exceptional breeding bird community.

### Features of European interest

The site is designated as a SAC for its:

- Beech forests on acid soils: an example of such habitat toward the north-east of its UK range, containing a notable selection of bryophytes, fungi and dead-wood invertebrates;
- Wet heathland with cross-leaved heath; and
- Dry heath
- Stagbeetle

### Key Requirements to Maintain Site Integrity

- Managed recreational access
- Minimal air pollution
- Maintenance of appropriate grazing
- Absence of non-native species
- Absence of direct fertilization.

## Essex Estuaries SAC and associated SPAs and Ramsar sites

The SAC comprises a typical, undeveloped, coastal plain estuarine system with associated open coast mudflats and sandbanks. The site includes the major estuaries of the Colne, Blackwater, Crouch and Roach rivers and is important as an extensive area of contiguous estuarine habitat. The site also has large areas of saltmarsh and other important coastal habitats.

The area includes a wide range of sediment flat communities, from estuarine muds, sands and muddy sands to fully saline, sandy mudflats with extensive growths of eelgrass on the open coast. The open coast areas of Maplin Sands and Dengie Flats have very extensive mudflats and an unusually undisturbed nature. Maplin Sands is particularly important for its large, nationally-important beds of dwarf eelgrass and associated animal communities.

The most extensive remaining stand of the native small cord-grass in the UK and possibly in Europe is found in the Essex Estuaries. The stand is located at Foulness Point.

The estuaries and marshes along the Essex coastline from Castle Point to Tendring district are designated as a series of SPAs and Ramsar sites.

### Features of European interest

The site is designated as a SAC for its:

- Estuaries
- Intertidal mudflats and sandflats
- Glasswort and other annuals colonising mud and sand
- Cord-grass swards
- Atlantic salt meadows
- Mediterranean saltmarsh shrub

### Key Requirements to Maintain Site Integrity

- Minimal disturbance
- Maintenance of grazing / mowing regimes
- Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze.
- Unpolluted water.
- Absence of nutrient enrichment.
- Absence of non-native species.
- Balance of saline and non-saline conditions
- Maintain morphological equilibrium of the estuary, including sedimentation patterns
- Maintain minimal impact of fishing, bait digging and dredging
- No increase in organic matter in sediments

**Blackwater Estuary (mid-Essex Coast Phase 4)** is designated as a SPA for its internationally important populations of:

- Little tern (breeding)
- Hen harrier, black-tailed godwit, dark-bellied brent goose, dunlin, grey plover, ringed plover and pochard (wintering)
- Ringed plover (on passage)
- An assemblage of over 100,000 waterfowl (wintering)

**Blackwater Estuary (mid-Essex Coast Phase 4)** is designated as a Ramsar for its:

- Extent and diversity of saltmarsh habitat
- Invertebrate fauna, including at least 16 British Red Data Book species
- Full and representative sequences of saltmarsh plant communities covering the range of variation in Britain
- Assemblage of over-wintering waterfowl
- Over-wintering populations of dark-bellied brent geese, dunlin, black-tailed godwit and grey plover

**Colne Estuary (mid-Essex Coast Phase 2)** is designated as a SPA for its internationally important populations of:

- Little tern (breeding)
- Golden plover, hen harrier, dark-bellied brent goose, redshank, pochard, and ringed plover (wintering)
- An assemblage of over 38,000 waterfowl (wintering)

**Colne Estuary (mid-Essex Coast Phase 2)** is designated as a Ramsar for its:

- Extent and diversity of saltmarsh habitat
- Invertebrate fauna, including at least 38 British Red Data Book species, and 12 nationally scarce plant species
- Full and representative sequences of saltmarsh plant communities covering the range of variation in Britain
- Assemblage of over-wintering waterfowl
- Over-wintering populations of dark-bellied brent geese and redshank

**Crouch and Roach Estuaries (mid-Essex Coast Phase 3)** is designated as a SPA for its internationally important populations of:

- Dark-bellied brent geese (wintering)

**Crouch and Roach Estuaries (mid-Essex Coast Phase 3)** is designated as a Ramsar for its:

- Nationally scarce plant species (13) and important invertebrate species
- Assemblage of overwintering waterfowl (almost 17,000)
- Over-wintering population of dark-bellied brent geese

**Dengie (mid-Essex Coast Phase 1)** is designated as a SPA for its internationally important populations of:

- Dark-bellied brent goose, hen harrier, knot and grey plover (wintering)
- An assemblage of over 30,000 waterfowl (wintering)

**Dengie (mid-Essex Coast Phase 1)** is designated as a Ramsar for its:

- Extent and diversity of saltmarsh habitat
- Nationally scarce plant species (11) and three Red Data Book invertebrates
- Full and representative sequences of saltmarsh plant communities covering the range of variation in Britain
- Assemblage of over-wintering waterfowl
- Over-wintering populations of dark-bellied brent geese, knot and grey plover

**Foulness (mid-Essex Coast Phase 5)** is designated as a SPA for its internationally important populations of:

- Avocet, common tern, little tern, sandwich tern and ringed plover (breeding)
- Avocet, bar-tailed godwit, dark-bellied brent geese, knot, oystercatcher, grey plover and hen harrier (wintering)
- Redshank (on passage)
- An assemblage of over 100,000 waterfowl (wintering)

**Foulness (mid-Essex Coast Phase 5)** is designated as a Ramsar for its:

- Extent and diversity of saltmarsh habitat
- Nationally scarce plant species and Red Data Book invertebrates
- Full and representative sequences of saltmarsh plant communities covering the range of variation in Britain
- Assemblage of over-wintering waterfowl
- Spring/Autumn populations of redshank and over-wintering populations of dark-bellied brent geese, knot, oystercatcher, bar-tailed godwit and grey plover

**Key Requirements to Maintain Site Integrity of SPAs/Ramsars**

- Minimal disturbance
- Maintenance of grazing / mowing regimes
- Freshwater inputs are of value for providing a localised increase in prey biomass for certain bird species, specific microclimatic conditions and are used for preening and drinking.
- Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze.
- Unpolluted water.
- Absence of nutrient enrichment.
- Absence of non-native species.
- Balance of saline and non-saline conditions
- Control of bait digging, dredging and fishing
- Maintenance of uninterrupted views
- Maintenance of natural sedimentation patterns
- Short grasslands surrounding parts of the sites are essential to maintaining interest features as they are now the key foraging resource for Brent goose
- Maintenance of hydrology of wet grassland (for waders)

**Hamford Water SPA and Ramsar site**

Hamford Water is a tidal inlet whose mouth is about three miles south of Harwich. It is a large and shallow estuarine basin comprising tidal creeks, intertidal mud and sand flats, saltmarshes, shingle spits, islands, beaches and marsh grasslands. The site is of international importance for breeding Little Terns and wintering dark-bellied Brent Geese, wildfowl and waders, and of national importance for many other bird species. It also supports communities of coastal plants and the intertidal areas support abundant invertebrates, mainly worms and thin shelled molluscs. Included within the site are the improved grass fields of Horsey Island which are feeding and roosting sites for the Hamford Water flock of Brent Geese, and for thousands of waders including Curlew and godwits.

**Features of European interest**

The site is designated as a SPA for its internationally important populations of:

- Little tern (breeding)
- Avocet, black-tailed godwit, teal, dark-bellied brent geese, ringed plover, grey plover, shelduck and redshank (wintering)
- Ringed plover (on passage)
- An assemblage of almost 45,000 waterfowl (wintering)

The site is designated as a Ramsar for its:

- Spring/Autumn populations of ringed plover and redshank, and over-wintering populations of dark-bellied brent geese and black-tailed godwit

**Key Requirements to Maintain Site Integrity**

- Minimal disturbance
- Unpolluted water.
- Absence of nutrient enrichment.
- Absence of non-native species.
- Open space for breeding terns
- Open areas to maintain view lines
- Off-site areas for feeding
- Appropriate vegetation structure

**Lee Valley SPA and Ramsar site**

The Lee Valley comprises a series of embanked water supply reservoirs, sewage treatment lagoons and former gravel pits along approximately 24 km of the valley. These waterbodies support internationally important numbers of wintering gadwall and shoveler, while the reedbeds support a small but internationally important population of bittern. In addition to the ornithological interest, the site also qualifies as a Ramsar site on account on rare and scarce plants and invertebrates present.

The Lee Valley SPA/Ramsar consists of four Sites of Special Scientific Interest, of which Turnford and Cheshunt Pits SSSI, Rye Meads SSSI and Amwell Quarry SSSI all lie on the Hertfordshire/Essex border. Walthamstow Reservoirs SSSI lies within London Borough of Waltham Forest. The Special Protection Area is managed by the Lee Valley Regional Park Authority and by Thames Water.

**Features of European interest**

The Lee Valley is designated as a SPA for its internationally important populations of:

- Bittern, gadwall and shoveler (wintering)

The Lee Valley is designated as a Ramsar for its:

- Nationally scarce water-milfoil and a rare/vulnerable water-boatman
- Over-wintering populations of gadwall and shoveler

**Key Requirements to Maintain Site Integrity**

- Minimal recreational disturbance
- Maintenance of grazing regime
- Maintenance of water supply

- Absence of nutrient enrichment.
- Lack of disturbance during winter months (October to March).
- Area of open water.
- Area of shallow water (<30cm) for feeding.
- Presence and abundance of aquatic plant food (e.g. sweet-grass and pondweeds).
- Presence and abundance of aquatic invertebrate food.
- Adjacent grassland nearby (especially Staines Moor), used for loafing.

**Stour and Orwell Estuaries SPA and Ramsar site**

The Orwell is a long and relatively narrow estuary with extensive mudflats and some saltmarsh. The freshwater grazing marshes which adjoin the estuary at Shotley, and the wet grassland and standing water of Trimley marshes, each form an integral part of the ornithological interest of the site. Shotley marshes are especially important for feeding dark-bellied brent geese, wigeon and snipe, and for breeding redshank and lapwing. Trimley marshes have become an important refuge for wintering and passage birds, as well as a key breeding site.

The Orwell Estuary supports a nationally important breeding number of avocet. It also supports a nationally important assemblage of breeding birds characteristic of open waters and their margins. The estuary regularly supports an important assemblage of more than 20,000 non-breeding waterfowl, with dunlin, redshank, black-tailed godwit and grey plover regularly attaining nationally important counts. The intertidal mud habitats, saltmarsh and adjacent areas used as high tide roosts are important for these wading birds.

Cormorant, shelduck, gadwall and pintail regularly occur in numbers of national importance. Also of national importance are the large numbers of dark-bellied brent geese. Numbers often fluctuate because of interchange with neighbouring estuaries. The intertidal mud habitats, saltmarsh, freshwater marshes and river channel are important to these birds for feeding and roosting.

The site supports a nationally important vascular plant assemblage, including at least nine nationally scarce plants. Inter-tidal mud habitats have a high invertebrate species richness within the sediments. The estuary also supports an example of a nationally important tide swept algae community with sponges, ascidians and red algae.

The Stour Estuary is nationally important for 13 species of wintering waterfowl and three species on autumn passage. The estuary is also of national importance for coastal saltmarsh, sheltered muddy shores, two scarce marine invertebrates and a vascular scarce plant assemblage.

The main concentration of feeding birds tends to be in the bays. High tide roosts are located in various places, mostly on the sheltered parts of the northern shore and on the southern shore at Deep Fleet and the ‘tidal bank’ of Copperas Bay and Bathside Bay.

**Features of European interest**

The Stour and Orwell Estuaries are designated as a SPA for their internationally important populations of:

- Avocet (breeding)
- Dark-bellied brent geese, pintail, redshank, dunlin, knot, black-tailed godwit and grey plover (wintering)

- An assemblage of over 60,000 waterfowl (wintering)

The Stour and Orwell Estuaries are designated as a Ramsar for their:

- Seven species of nationally scarce plants
- Assemblage of over-wintering waterfowl
- Spring/Autumn populations of redshank and over-wintering populations of dark-bellied brent geese, pintail, redshank, dunlin, knot, black-tailed godwit and grey plover

**Key Requirements for Maintaining Site Integrity**

- Minimal recreational disturbance
- Maintenance of grazing / mowing regimes
- Freshwater inputs are of value for providing a localised increase in prey biomass for certain bird species, specific microclimatic conditions and are used for preening and drinking.
- Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze.
- Unpolluted water.
- Absence of nutrient enrichment.
- Absence of non-native species.
- Balance of saline and non-saline conditions
- Control of bait digging, dredging and fishing
- Maintenance of uninterrupted views
- Maintain hydrology of wet grassland (for waders).
- Maintenance of natural sedimentation patterns

**Outer Thames Estuary pSPA**

The Outer Thames Estuary pSPA lies across both English territorial waters and UK offshore waters. The pSPA boundary extends from a central point mid-river just east of Southend on the Essex side and on the Kent side from a point just east of Sheerness to approximately just east of Herne Bay. To the north of this area two separate parts of the site extend southwards along the coasts of east Norfolk and Suffolk and offshore from the Lowestoft area. The seaward boundary of the pSPA lies partly within the 20m depth contour and marginally (along the outer eastern edge) within the 20-50 m depth contour.

The Outer Thames Estuary pSPA consists of areas of shallow and deeper water, high tidal current streams and a range of mobile sediments. Large areas of mud, silt and gravelly sediments form the deeper water channels, the main ones of which form the approach route to the ports of London and as such are continually disturbed by shipping and maintenance dredging. Sand in the form of sandbanks separated by troughs predominates in the remaining areas and the crests of some of the banks are exposed at mean low water.

The seabed in the area of the Norfolk and Suffolk coast is of a similar composition to that in the main estuary with large shallow areas of mud, sand, silt and gravely sediments but, in the absence of main port areas within this area, there is consequently less disturbance through shipping or dredging.

Almost 6,500 red-throated divers are estimated to winter in the designated area.

**Features of European interest**

The Outer Thames Estuary is designated as a pSPA for its internationally important population of:

- Red-throated diver

**Key Requirements for Maintaining Site Integrity**

- Minimal disturbance
- Avoidance of dredging
- Avoidance of physical disturbance (e.g. extraction)
- Maintenance of high water quality
- Maintenance of area of submerged sandbanks

**Wormley-Hoddesdonpark Woods SAC**

This SAC consists of two SSSIs – Wormley-Hoddesdonpark Woods North and Wormley-Hoddesdonpark Woods South and is situated approximately 5km to the west of Harlow. The semi-natural woodland is of national importance as an example of lowland south-east sessile oak/hornbeam type with the pedunculate oak/hornbeam variant also present. Additionally, small ponds and streams are important habitats for bryophytes.

**Features of European interest**

Wormley-Hoddesdonpark Woods is designated as a SAC for its:

- Oak-hornbeam forests

**Key Requirements for Maintaining Site Integrity**

- Appropriate woodland management
- Absence of invasive species
- Minimal recreational or urbanization pressure – in particular a low incidence of wildfires.
- Minimal air pollution (nitrogen deposition can cause compositional changes over time).

**Thames Estuary and Marshes SPA and Ramsar site**

The majority of this site is situated within Kent as South Thames Estuary & Marshes SSSI, while additional parts are located north of the River Thames (Mucking Flats & Marshes SSSI; Inner Thames Marshes SSSI).

South Thames Estuary and Marshes SSSI consists of an extensive mosaic of grazing marsh, saltmarsh, mudflats and shingle characteristic of the estuarine habitats of the north Kent marshes. Freshwater pools and some areas of woodland provide additional variety and complement the estuarine habitats. The site supports outstanding numbers of waterfowl with total counts regularly exceeding 20,000. Many species regularly occur in nationally important numbers and some species regularly use the site in internationally important numbers. The breeding bird community is also of particular interest. The diverse habitats within the site support a number of nationally rare and scarce invertebrate species and an assemblage of nationally scarce plants. The SSSI adjoins the Medway Estuary and Marshes SPA and Ramsar.

Mucking Flats & Marshes in Thurrock is an internationally important feeding habitat for birds, particularly during the overwintering period. Mucking Flats & Marshes is by far the most important part of the SPA for feeding avocets and has supported a single flock in March 2003 of 1395 birds. This is the largest single count of avocet ever recorded in the UK and represents 1.9% of the international population. Mucking Flats & Marshes is also the most important location in the Thames Estuary for grey plover, black-tailed godwit and redshank. Over the 3 year period from 99/00 to 01/02 Mucking Flats & Marshes supported a peak mean count of 16,435 birds, during which time even the mean number of birds was over 11,000.

**Features of European interest**

The Thames Estuary and Marshes is designated as a SPA for its internationally important populations of:

- Hen harrier, avocet, dunlin, knot, redshank, ringed plover, grey plover and black-tailed godwit (wintering)
- Ringed plover (on passage)
- An assemblage of over 75,000 waterfowl (wintering)

The Thames Estuary and Marshes is designated as a Ramsar for its:

- Invertebrate fauna, including at least 20 British Red Data Book species, and at least 14 nationally scarce plant species, plus one endangered plant species
- Assemblage of over-wintering waterfowl
- Spring/Autumn populations of black-tailed godwit and ringed plover, and over-wintering populations of dunlin, knot, redshank and grey plover

**Key Requirements for Maintaining Site Integrity**

- Minimal disturbance
- Maintenance of grazing / mowing regimes
- Freshwater inputs are of value for providing a localised increase in prey biomass for certain bird species, specific microclimatic conditions and are used for preening and drinking.
- Sufficient space between the site and development to allow for managed retreat of intertidal habitats and avoid coastal squeeze.
- Unpolluted water.
- Absence of nutrient enrichment.

- Absence of non-native species.
- Balance of saline and non-saline conditions
- Control of bait digging, dredging and fishing
- Maintenance of uninterrupted views
- Maintain hydrology of wet grassland (for waders).
- Maintenance of natural sedimentation patterns