DEPARTMENT OF ENERGY & CLIMATE CHANGE

Habitats Regulations Assessment

Site Report for Hartlepool

EN-6: Revised Draft National Policy Statement for Nuclear Power Generation

Planning for new energy infrastructure

October 2010

Habitats Regulations Assessment of the revised draft Nuclear National Policy Statement

Habitats Regulations Assessment (HRA) screening and Appropriate Assessment (AA) of the revised draft Nuclear NPS including potentially suitable sites, has been undertaken in parallel with the Appraisal of Sustainability (AoS). These strategic assessments are part of an ongoing assessment process that will continue with project level assessments. Applications to the IPC for development consent will need to take account of the issues identified and recommendations made in the strategic, plan level HRA/AA; and include more detailed project level HRA as necessary.

The Habitats Regulations Assessment is provided in the following documents:

HRA Non-Technical Summary

Main HRA of the revised draft Nuclear NPS

Introduction
Methods
Findings
Summary of Sites
Technical Appendices

Annexes to the Main HRA Report: Reports on Sites

Site HRA Reports
Technical Appendices

All documents are available on the website of the Department of Energy and Climate Change at www.energynpsconsultation.decc.gov.uk

This document is the Habitats Regulations Assessment Site Report for Hartlepool.

This document has been produced by the Department of Energy and Climate Change based on technical assessment undertaken by MWH UK Ltd with Enfusion Ltd and Nicholas Pearson Associates Ltd.

Contents

List of Tables

List of Figures

Appendices

1 Introduction

This HRA Report

1.1. This report sets out the HRA Screening and Appropriate Assessment components of the Habitats Regulations Assessment (HRA) of the proposals for Hartlepool. This site was nominated into the Strategic Siting Assessment (SSA) process to be considered as a potentially suitable site for the deployment of a new nuclear power station(s) by the end of 2025. This site report is one of the Site HRA Reports comprising Part III of the HRA Report that accompanies the revised draft Nuclear National Policy Statement (NPS). Part II of the HRA report for the revised draft Nuclear NPS sets out details of the HRA process, methods, findings and summary of the individual assessments at the nominated sites. Part I of the HRA report is a Non-Technical Summary.

1.2. This HRA has been undertaken at a strategic level and is part of an ongoing assessment process that started in July 2008 and will continue with project level assessments. Sites that are assessed to be potentially suitable for the deployment of new nuclear power stations by 2025, will be listed in the Nuclear NPS; developers will be able to apply to the Infrastructure Planning Commission for development consent to develop new nuclear power stations at those sites.

1.3. Each development consent will need to be accompanied by a project level HRA report, alongside an Environmental Statement reporting the findings of a detailed Environmental Impacts Assessment (EIA). The proposals will also be subject to various other regulatory and licensing requirements.

The Nuclear National Policy Statement

1.4. The revised draft Nuclear NPS sets out a list of sites that, following the Strategic Siting Assessment, have been found to be potentially suitable for the siting of new nuclear power stations by 2025, and the framework by which development consent applications on these sites should be considered by the Infrastructure Planning Commission[1].

[1] The Government announced in June 2010 its intention to amend the Planning Act 2008 and abolish the Infrastructure Planning Commission (IPC). In its place, the Government envisages that a Major Infrastructure Planning Unit (MIPU) will be established within the Planning Inspectorate. Once established, the MIPU would hear examinations for development consent and would then make a recommendation to the Secretary of State. It would not itself determine applications and decisions would be taken by the relevant Secretary of State. These proposed reforms require primary legislation. Until such time as the Planning Act 2008 is amended, the IPC will continue as set out in that Act. As a result, the NPSs will provide the framework for decisions by the IPC on applications for development consent for major infrastructure projects, and under the new arrangements will provide the framework for recommendations by the MIPU to the Secretary of State.

HRA Process

1.5. The Habitats Directive[2] protects habitats and species of European nature conservation importance. Together with the Birds Directive[3], the Habitats Directive established a network of internationally important sites designated for their ecological status. Special Protection Areas (SPAs) are designated under the Birds Directive in order to protect rare, vulnerable and migratory birds. Special Areas of Conservation (SACs), and Sites of Community Importance (SCI's) are designated and defined under the Habitats Directive and promote the protection of flora, fauna and habitats. Internationally important wetlands are designated under the Ramsar Convention 1971, and the UK Government policy states that the Ramsar sites are afforded the same protection as SPAs and SACs for the purpose of considering development proposals that may affect them[4]. These sites combine to create a Europe-wide 'Natura 2000' networkof European Sites, which are hereafter referred to as 'European Sites'[5] in this and other HRA reports[6].

1.6. Habitats Regulations Assessment (HRA) tests whether the impacts identified as arising from a proposal, plan or project are likely to have a significant effect on European Sites of nature conservation importance. Article 6(3) of the Habitats Directive requires an '*appropriate assessment*' to be undertaken on proposed plans or projects which are not necessary for the management of the European Site, but which are likely to have a significant effect on one or more European Sites either individually, or in combination with other plans, programmes or projects. In England and Wales this requirement is transposed into UK law by the Conservation of Habitats and Species Regulations 2010[7] (the 'Habitats Regulations'). The process of fulfilling the requirements of the Directive and the Regulations is now in practice referred to as HRA, and Appropriate Assessment (AA) if required, forms a stage within the overall HRA process.

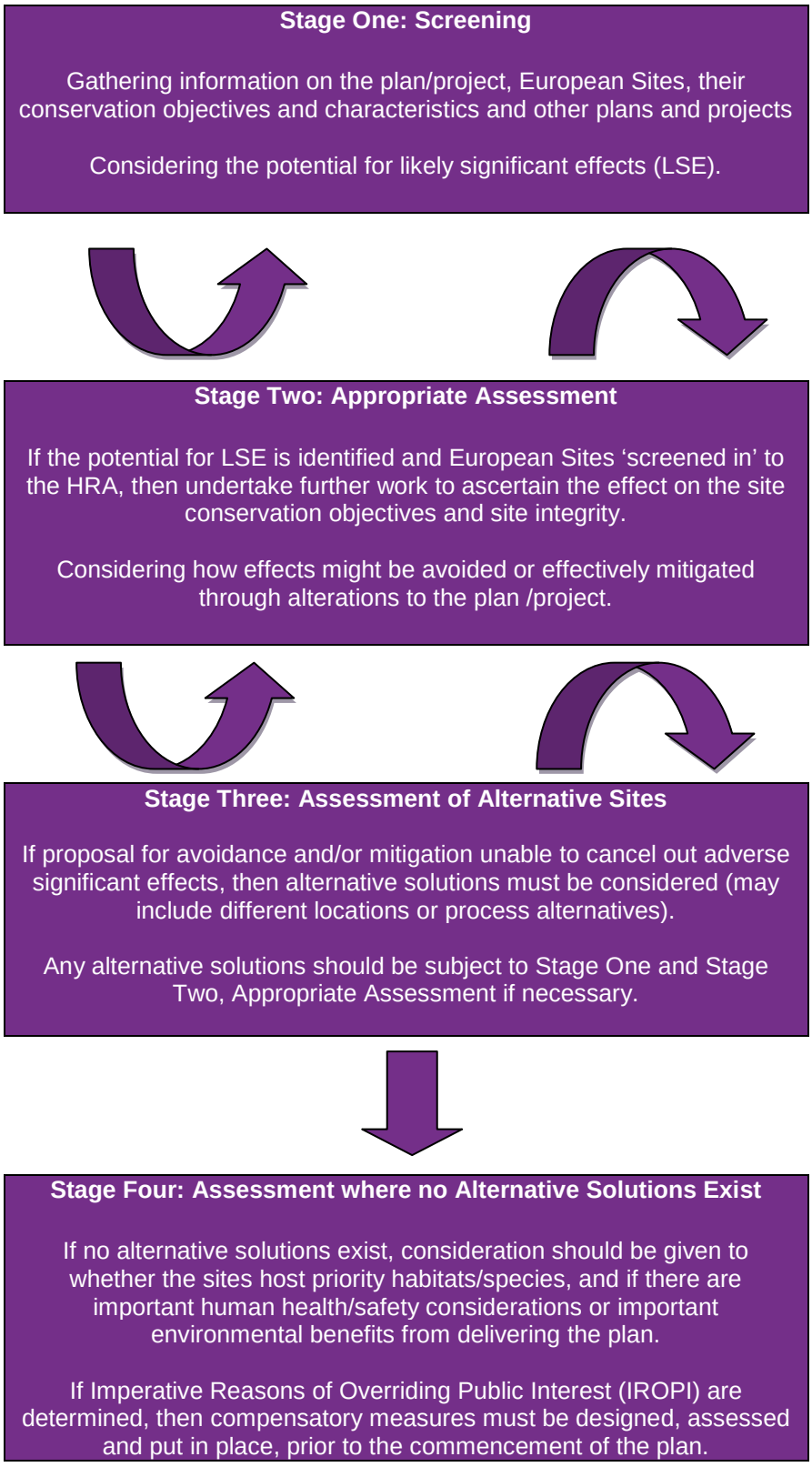
1.7. The full details of the HRA method and process, including the key principles and any assumptions made in this plan level HRA of the revised draft Nuclear NPS and nominated sites; are outlined in Part II of the HRA Report. This report covers the screening and Appropriate Assessment (AA) stages of the HRA for the nominated site, as outlined in Table 1. It takes into account the information contained within the

2 Council Directive 92/43/EEC on the conservation of natural habitats and of wild flora and fauna: http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992L0043:EN:HTML
3 Council Directive 79/409/EEC on the protection of wild birds: http://eur-lex.europa.eu/LexUriServ/site/en/consleg/1979/L/01979L0409-20070101-en.pdf
4 ODPM, 2005, Planning Policy Statement 9: Biological and Geological Conservation; and ODPM Circular 06/2005: Biodiversity and Geological Conservation – Statutory Obligations and their impact within the Planning System
5 Ramsar sites are included within the definition of European Sites for the purposes of this report.
6 The term European Site is used throughout all the Site HRA Reports and in the Main HRA Report, and incorporates SACs, SPAs, SCI's and Ramsar sites.
7 Regulation 106 applies the requirements and controls in relation to plans under the regulations to National Policy Statements designated under the Planning Act 2008

site nomination submitted to Government by the nominator (EDF Energy) on 31 March 2009[8]. The HRA process is typically iterative and assessments have been revised on the basis of commentary from the Statutory Consultees and comments received during the public consultation which took place between November 2009 and February 2010.

8 http://www.nuclearpowersiting.decc.gov.uk/nominations/

Table 1: Habitats Regulations Assessment: Summary Overview of Key Stages [9]



9 Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article6(3) and (4) of the Habitats Directive 92/43/EEC. European Commission DG Environment (2001) http://ec.europa.eu/environment/nature/natura2000/management/guidance_en.htm

2 HRA Screening of Hartlepool

2.1 The nominated site[10] is situated on the northern bank of the mouth of the River Tees, 2.5 miles south of Hartlepool. Hartlepool lies within the unitary authority of the Borough of Hartlepool, in the North East of England. The location of the site is shown in Figure 1.

Screening

2.2 The screening process forms the first stage of any HRA and is focused on the 'likely significant effect' (LSE) test. The aim of the LSE test is to determine whether the plan either alone, or in-combination with other plans and projects is likely to result in a significant effect at European Site[s]. This is essentially a risk assessment process that seeks to understand whether there are any mechanisms for identified impacts arising from the plan to adversely affect the European Sites (i.e. a cause-effect pathway)[11]. The key questions asked are:

- would the effect undermine the conservation objectives for the site?
- can significant effects be excluded on the basis of objective information?

2.3 The tasks undertaken to complete the screening process for Hartlepool are described below.

European Site Identification and Characterisation

2.4 European Sites within a 20km radius of the nominated site were scoped into the screening process as set out in Table 2 and Figure 2 This area of search reflects guidance recommendations[12], but also takes into account that distance is in itself not a definitive guide to the likelihood or severity of impacts known to arise from developments (for example, inaccessibility/ remoteness is typically more relevant) and factors such as the prevailing wind directions, river and groundwater flow direction will all have a bearing on the relative distance at which an impact can occur. It should be noted that an area of land can be covered by more than one European designation.

10 As proposed through the nominations process
11 Therivel (May 2008). Appropriate Assessment of Plans.
12 Communities and Local Government (2006). Planning for the Protection of European Sites: Appropriate Assessment – Guidance for Regional Spatial Strategies and Local Development Documents.

Table 2: European Sites within 20km of the nominated Site

	Designation	Distance from nominated site[13]
Castle Eden Dene	**SAC**	15.0 km
North York Moors	**SAC**	15.6 km
Durham Coast	**SAC**	11.1 km
North York Moors	**SPA**	15.6 km
Northumbria Coast	**SPA**	11.1 km
Teesmouth and Cleveland Coast	**SPA**	Partly within
Northumbria Coast	**Ramsar**	11.1 km
Teesmouth and Cleveland Coast	**Ramsar**	Partly within

2.5 **Appendix 1** details the characteristics of the eight European Sites scoped into the Screening Assessment. The characterisations include an overview of the sites:

- ecological features;
- their qualifying features/ reasons for designation;
- conservation objectives and the condition status of their constituent Sites of Special Scientific Interest (SSSIs), where available;
- environmental conditions necessary to support site integrity; and
- site vulnerabilities, including any key pressures or trends known to be affecting the sites.

Nominated site Review and Identification of Likely Impacts

2.6 The nomination documents[14] identifies that the nominated site extends past the North Gare breakwater (part of the Seaton Dunes and Commons SSSI). It states that the main development would be to the centre or the south of the site, with the northern area being likely to be required for cooling water infrastructure. The nominated site area for Hartlepool is approximately 140 hectares, including the northern area required for cooling water infrastructure. Within this, the developer states that the main operational footprint of one nuclear power station is likely to be approximately 30 - 50 hectares. Additional land will also be required for cooling water intake and outfall structures, and possibly coastal defences, beyond the nominated site boundary. The developer was not required to provide details of the proposed development at this stage.

2.7 From the nomination documents[15] it is assumed that the nomination is for a nuclear power station development, incorporating:

13 Distance measured is from the nearest boundary.
14 EDF Energy (2009). Site Nomination Report for Hartlepool: Strategic Siting Assessment for the development of New Nuclear Power Stations in the UK, at http://www.energynpsconsultation.decc.gov.uk
15 Op cit.

- at least one nuclear reactor;
- construction phase areas and facilities;
- infrastructure and facilities related to the operation of a nuclear power station, such as highways and transmission infrastructure;
- flood defence improvements and coastal protection measures;
- cooling water infrastructure, including cooling water intake and outfall structures beyond the nominated site boundary;
- interim radioactive waste storage facilities.

2.8 The full range of potential impacts on environmental conditions and biodiversity arising from the development of new nuclear power stations are outlined and discussed in Part II of the HRA Report. Impacts of particular relevance to the nominated site include: direct habitat loss, fragmentation and disturbance, and effects on water and air quality. These issues are discussed in detail in the Screening Assessment task below.

Identification and Consideration of Other Plans, Programmes and Projects

2.9 It is a requirement of Article 6(3) of the Habitats Directive that HRA examines the potential for plans and projects to have a significant effect either individually or 'in-combination' with other plans, programmes and projects (PPPs). The aim is that plans and projects are evaluated within the context of the prevailing environmental conditions and that account is taken of their effects.

2.10 Plan level HRA practice has shown that the in-combination assessment is most relevant where plans might otherwise be screened out because their individual contribution is inconsequential. The requirement is that the HRA assessment process should take account of reasonably foreseeable impacts (as opposed to every conceivable effect)[16].

2.11 For the purposes of this assessment consideration was given to:

- Local Development Framework documents;
- Major Development Schemes (including transport plans/ airport expansion) where relevant; and
- (Coastal) Tourism Strategies.

2.12 Where relevant, reference was also made to:

- Coastal Habitat Management Plans;
- Catchment Abstraction Management Strategies;
- Catchment Flood Management Plans;
- Shoreline Management Plans;

16 Tyldesley, D. (2009) Habitats Regulations Assessment of Local Development Documents. Revised Guidance for Natural England. Natural England, Sheffield.

- River Basin Management Plans;
- Minerals and Waste Development Frameworks; and
- Water Resource Management Plans.

2.13 A summary of the key plans referred to in the in-combination assessment process is provided in **Appendix 2**.

Screening Assessment

2.14 The following sections outline the issues arising from the Screening Assessment (LSE test) undertaken at **Appendix 3**, for the nominated site at Hartlepool. The screening assessment indicated that development at Hartlepool has the potential to adversely affect European Sites as a result of:

- **Water Resources and Quality Impacts;**
- **Habitat (and Species) Loss and Fragmentation;**
- **Coastal Squeeze;**
- **Disturbance (Noise, Light and Visual); and**
- **Air quality.**

Water Resources and Quality Impacts

European Sites for which no significant effects are likely (see Appendix 3):

- Castle Eden Dene SAC
- North York Moors SAC
- Durham Coast SAC
- North York Moors SPA

European Sites for which significant effects are likely (see below):

- Northumbria Coast SPA / Ramsar
- Teesmouth and Cleveland Coast SPA / Ramsar

2.15 The quality of fresh and marine water that feeds and supports the protected European Sites is a key determinant in ensuring the integrity of the habitats and dependant species of the protected sites. Poor water quality arising from the build up of heavy metals and salts and from the discharge of toxic compounds (that may also bind to sediments) can lead to mortality in aquatic life and upon those predators that feed upon them (for example, bird species). Toxins can accumulate in animals and plants through uptake and ingestion through the food chain and can also increase the vulnerability of species to disease. Moreover changes in water quality such as through nutrient enrichment (eutrophication) which can affect the availability of oxygen can dramatically alter habitat and species compositions, with direct and indirect detrimental impacts upon dependant species over

time. Water abstraction can also impact upon habitats and species, as the removal of water from the natural cycle can affect groundwater supply to protected habitats and result in habitat loss and/or degradation.

2.16 The HRA Screening Assessment reviewed the potential for impacts on water resources and quality arising from the construction, operation and decommissioning phases of a new nuclear power station at the nominated site. Issues include:

- increased/ altered drainage from earthworks and excavations and potential sedimentation changes;
- alteration of flow through abstraction and the return of additional water volumes to the aquatic system;
- changes to water temperature creating 'thermal plumes' as a result of controlled discharges;
- the potential for toxic contamination (for example from anti-fouling agents associated with cooling water systems) from accidental leakage may interact or combine with routine non-radioactive or radioactive discharges that will be subject to discharge consents regulated by the Environment Agency.

2.17 Of the eight European Sites screened, four were identified as possessing specific vulnerabilities relating to the water resource.

Northumbria Coast SPA/Ramsar;

2.18 The qualifying features for Northumbria Coast SPA/Ramsar site are breeding Little Tern and overwintering Ruddy Turnstone and Purple Sandpiper. The habitats supporting these internationally important populations of birds include sandy beaches, shallow inshore waters, rocky shores (associated with boulders and cobble beaches) and artificial high tide roosts. Change in water temperature, salinity, organic loading can impact the marine communities that the birds feed on. Organic and nutrient enrichment and changes in turbidity can reduce the visibility of prey for Little Terns. Rocky shores are moderately sensitive to nutrient and organic loading and this is the predominant habitat found within the SPA/Ramsar site. The strand line supports high densities of invertebrates which are important food for Purple Sandpiper and Ruddy Turnstone. These species are sensitive to the introduction of synthetic and non-synthetic compounds (either through bioaccumulation or through direct contact with toxic prey). In addition, birds can be impacted as a result of changes to the palatability of their prey items. **The Screening Assessment has revealed the potential for water resources and quality impacts for Northumbria Coast SPA/Ramsar and these should be considered further through Appropriate Assessment to determine the nature and extent of the potential significant effects identified.**

Teesmouth and Cleveland Coast SPA/Ramsar

2.19 The qualifying features for Teesmouth and Cleveland Coast SPA are breeding Little Tern, on passage Sandwich Tern and Ringed Plover and overwintering Knot and Redshank. The important assemblage of wintering waterfowl (over 21,000) which include: Sanderling, Lapwing, Shelduck, Cormorant, Redshank and Knot. These species are reliant on the habitats supporting them which are, sand shingle, intertidal sandflats, saltmash, mudflats, shallow coastal waters, rocky shores and freshwater marsh and pools. The qualifying features of the Teesmouth and Cleveland Coast Ramsar site are redshank and red knot and include the same habitats listed.

2.20 The Teesmouth and Cleveland Coast SPA/Ramsar site sits at the mouth of the estuary and includes Seal Sands (component SSSI). Given that the Tees is reported[17] as one of the most contaminated estuaries in the UK, owing to the large industrial, (for example, petrochemical and chemical) and domestic sewage discharges in the vicinity, the exposure level for synthetic and non-synthetic contamination is high, as is the degree of vulnerability of the migratory bird populations. Nutrient enrichment at Seal Sands has resulted in dense algal mats which are known to suppress densities of mud-dwelling invertebrates in sediments beneath them and this in turn has reduced the foraging efficiency of redshank[18]. Screening for this SPA/Ramsar site revealed that there are likely significant effects to water quality from construction (earthworks/ excavations, infrastructure provision), operation (changes in organic loading, sedimentation and contamination of sediments) and decommissioning (from decommissioning activities, earthworks, infrastructure, conventional waste storage). The remobilisation of synthetic compounds and non-synthetic compounds previously locked up in soft intertidal sediments (from previous development in the estuary) has the potential to affect benthic invertebrates within this SPA/Ramsar site which in turn may affect the Knot, Redshank, Teal and Shelduck that feed upon them. Toxic effects on invertebrates may also be caused by existing discharges. Changes to the thermal regime of the coastal waters as a result of direct sea water cooling could affect the structure of plankton and benthic communities which in turn could affect qualifying interests through a change or reduction in prey availability. **There is therefore the potential for adverse effects on the site integrity of these two European Sites and this should be considered further through Appropriate Assessment.**

17 Environment Agency (2009). River Basin Management Plan Northumbria River Basin District.
18 Final Contract Report for the Environment Agency (2004). Report (an investigation of the sediment budget, the fate of contaminants, and dating sediment contamination in the Teesmouth and Cleveland Coast SPA. University of Durham.

Habitat (and Species) Loss and Fragmentation

European Sites for which no significant effects are likely (see Appendix 3):

- Northumbria Coast SPA / Ramsar
- Castle Eden Dene SAC
- North York Moors SAC
- Durham Coast SAC
- North York Moors SPA

European Sites for which significant effects are likely (see below):

- Teesmouth and Cleveland Coast SPA / Ramsar

2.21 Habitat loss and fragmentation in relation to European Site integrity can occur naturally (for example, tree fall, changing flow patterns in aquatic systems) or as a result of human intervention. Direct anthropogenic impacts such as through the construction of road and transport infrastructure or required flood and sea defences as a result of encroachment of the development footprint upon the coastal fringe can present barriers to species migration and result in the removal of habitats which cannot be easily be re-created. Such construction can also directly affect nutrient flows, sediment loading, and habitat connectivity.

Teesmouth and Cleveland Coast SPA/Ramsar

2.22 The Screening Assessment noted the potential for direct impacts through habitat loss and fragmentation from all phases (construction, operation and decommissioning) of development at Hartlepool, including construction of a power station itself and of infrastructure and facilities related to the operation of a power station. However, owing to the uncertainty with respect to the design and footprint of the development, it is likely that there will be a direct loss of designated habitat, albeit temporary. The footprint of the nominated site at Hartlepool shows that the development will encroach onto part of the Teesmouth and Cleveland Coast SPA/Ramsar (Seaton Dunes and Commons SSSI). These areas comprise habitats (extensive areas of mudflats and dunes) that support large numbers of migratory wildfowl (c. 4,000) and wading birds (c. 24,000) especially during the winter months. Any development (or associated infrastructure) at the nominated site that may impinge onto these areas is likely to have a significant effect on these European Sites. In addition, the development of the nominated site may also affect SPA bird species through loss of areas within the nominated site adjacent to the SPA that may be important for these birds (e.g. high tide roost sites).

Therefore likely significant effects are assumed and the potential adverse effects of habitat loss and fragmentation on European Sites conservation objectives and site integrity should be considered further through Appropriate Assessment.

Coastal Squeeze

European Sites for which no significant effects are likely (see Appendix 3):

- Northumbria Coast SPA / Ramsar
- Castle Eden Dene SAC
- North York Moors SAC
- Durham Coast SAC
- North York Moors SPA

European Sites for which significant effects are likely (see below):

- Teesmouth and Cleveland Coast SPA / Ramsar

2.23 Coastal squeeze impacts are closely related to habitat loss and fragmentation, and relate specifically to situations where the coastal margin is squeezed by the fixed landward boundary. Coastal squeeze typically arises through the development of flood and sea defences and the reinforcement of coastal margins through hard engineering (construction works, drainage, infrastructure provision), thereby preventing the natural transport and movement of coastal material, species and habitats.

Teesmouth and Cleveland Coast SPA/Ramsar

2.24 Given that the nominated site is located on the coast there is the potential for loss of marine (intertidal and subtidal) habitats to occur during the construction phase, particularly where the development may encroach upon the coastal fringe. This would result in the boundaries of the nominated site at Hartlepool extending into the coastal margins bordering Teesmouth and Cleveland Coast SPA / Ramsar. Such encroachment would impact directly or indirectly upon the margins of these sites. As noted in relation to the issues of habitat loss and fragmentation, the qualifying features for these European Sites are all vulnerable to any changes or losses to the habitats upon which they depend. **Therefore likely significant effects are assumed and the potential for adverse effects in relation to coastal squeeze should be considered further alongside habitat loss and fragmentation through further Appropriate Assessment.**

Disturbance (Noise, Light and Visual)

European Sites for which no significant effects are likely (see Appendix 3):

- Northumbria Coast SPA / Ramsar
- Castle Eden Dene SAC
- North York Moors SAC
- Durham Coast SAC
- North York Moors SPA

European Sites for which significant effects are likely (see below):

- Teesmouth and Cleveland Coast SPA / Ramsar

Teesmouth and Cleveland Coast SPA/Ramsar Site

2.25 Disturbance to habitats and species can arise from a number of sources. While recreational activities are frequently implicated in disturbance events, sources can also include traffic, construction activity and intermittent sounds (for example, alarms/ sirens). The impacts upon bird species can be particularly significant and tend to occur on a continuum where the most disturbing activities are those that are irregular, unpredictable loud noise events and movement or vibration of a long duration. Disturbance issues are likely to be of relevance to wintering and migratory waterbirds, in particular on Seal Sands and Seaton Dunes and Common. **Given the extended construction phase of the development and identified sensitivities of the designated species to disturbance events, likely significant effects are assumed and the potential for adverse effects on site integrity should be considered further through Appropriate Assessment.**

Air Quality Impacts

European Sites for which no significant effects are likely (see Appendix 3):

- Northumbria Coast SPA / Ramsar
- Castle Eden Dene SAC
- North York Moors SAC
- Durham Coast SAC
- North York Moors SPA

European Sites for which significant effects are likely (see below):

- Teesmouth and Cleveland Coast SPA / Ramsar

2.26 The effects of changing and poor quality at European Sites vary according to pollutant type (acid deposition, ammonia, nitrogen oxides, and ozone and sulphur dioxide) and the nature of the receiving environment. The key pollutants that are of concern for terrestrial habitats are sulphur dioxide (SO_2), ammonia (NH_3) and nitrogen oxides (NO_x). Deposition of nitrogen oxides can lead to soil enrichment and sulphur dioxide to acidification which may alter species composition with impacts on associated species.

2.27 Background in air quality in the UK has improved progressively and is expected to continue to improve significantly over the next 15 years with tightening emissions standards and moves towards 'cleaner' energy generation.

Teesmouth and Cleveland Coast SPA/Ramsar site

2.28 The Screening Assessment noted the potential for impacts on air quality at a local level arising from the construction, operation and decommissioning phases of Hartlepool. These impacts were considered to arise in particular from the construction/ development and decommissioning processes (for example, fugitive dust and airborne particulates). Increased traffic generation is also of concern during development phases, and major roads within 0.2km have the potential to increase nitrogen and carbon emissions impacts from vehicles[19].

2.29 The assessment also noted the potential for radioactive releases to the atmosphere, but that regulatory sources indicate aerial emissions to be low and cause little (human) and biodiversity radiation exposure[20].

2.30 Effects on all sites apart from Teesmouth and Cleveland Coast SPA/Ramsar site are considered unlikely to be significant and have been screened out due their distance from the nominated site. There is however, the potential that increased levels of nitrogen may have an impact on habitats supporting the qualifying bird species at Teesmouth and Cleveland Coast SPA/Ramsar site. Moreover this area currently exceeds its critical load for nitrogen deposition[21], which in turn may lead to increased local eutrophication and acidification. Little Tern nest in open areas on shingle or sand. An increase in nitrogen deposition may have a deleterious impact on breeding Little Tern by promoting plant growth in the open areas and thereby reducing the open space available for nesting. **Therefore likely significant effects are assumed and the potential for adverse effects on the site integrity**

19 Department for Transport (2003) Transport Analysis Guidance, the Local Air Quality Sub-Objective TAG Unit 3.3.3.
20 Environment Agency (2005) Measuring Environmental Performance, Sector Report for the Nuclear Industry.
21 RSS for the North East (2008).

on Teesmouth and Cleveland Coast SPA/Ramsar site should be considered further through Appropriate Assessment.

Conclusions and Recommendations

2.31 In line with the screening requirement of the Habitats Directive and Regulations, an assessment was undertaken to determine the likely significant effects of the development at Hartlepool on the eight European Sites that lie within 20km of the nominated site. The Screening Assessment (Appendix 3) analysis and conclusions were informed by:

- The information gathered on the European Sites – **Appendix 1**;
- The summary analysis of potential environmental impacts generated by the development activities arising from Hartlepool **;**
- Consideration, where necessary, of other plans and projects that have spatial/ contextual relevance – **Appendix 2;**
- Government guidance[22] which indicates that HRA for plans is typically broader and more strategic than project level HRA and that it be undertaken at a level that is proportionate to the available detail of the plan.

2.32 The Screening Assessment identified a number of key impacts arising from the development and the potential for significant effects at four of the European Sites scoped into the screening process. These findings are summarised in Table 3 below.

Table 3: Summary of Likely Significant Effect Screening

European Sites within 20 km of the nominated site at Hartlepool	Water Resources and Quality	Habitat Loss and Fragmentation	Coastal Squeeze	Disturbance (Noise, Light, Visual)	Air Quality
Castle Eden Dene SAC	✗	✗	✗	✗	✗
Durham Coast SAC	✗	✗	✗	✗	✗
North York Moors SAC	✗	✗	✗	✗	✗
North York Moors SPA	✗	✗	✗	✗	✗
Northumbria Coast SPA	✓	✗	✗	✗	✗
Teesmouth and Cleveland Coast SPA	✓	✓	✓	✓	✓

22 "Planning for the Protection of European Sites: Appropriate Assessment - Guidance For Regional Spatial Strategies and Local Development Documents", http://www.communities.gov.uk/archived/publications/planningandbuilding/planning2

Northumbria Coast Ramsar	✓	✗	✗	✗	✗
Teesmouth and Cleveland Coast Ramsar	✓	✓	✓	✓	✓

Key		
Likely Significant Effect	✓	**further Appropriate Assessment required**
No Likely Significant Effect	✗	**no further Appropriate Assessment required**
Significant Effect Uncertain	**?**	**precautionary approach taken and further Appropriate Assessment required**

2.33 It is recommended that the HRA proceeds to the next stage of 'Appropriate Assessment' in relation to the four European Sites where the potential for likely significant effects (✓) or significant effect uncertain (**?**) has been identified. This next stage of the HRA process is outlined in the following section 3 of this report.

3 HRA Appropriate Assessment of Hartlepool

Scoping and Additional Information Gathering

3.1 To support the Appropriate Assessment (AA) phase, additional information was gathered on the European Sites and environmental conditions, in line with the specific issues identified by the Screening Assessment. This additional information included air quality data from the UK Air Pollution Information System (APIS) and water quality and abstraction data produced by the Environment Agency.

Assessing the Impacts (in-combination) Appropriate Assessment

3.2 The HRA Screening Assessment considered whether the impacts arising from the development of a new nuclear power station at Hartlepool have the potential to significantly affect the European Sites scoped in to the assessment process. The following sections summarise the analysis undertaken to determine whether the effects on sites are likely have an adverse effect on European Site integrity, either alone or in-combination with other plans and projects. This was done by making an assessment against the conservation objectives for each European Site (detailed in Appendix 1).

Water Resources and Quality

Northumbria Coast SPA/Ramsar; Teesmouth and Cleveland Coast SPA/Ramsar

3.3 The Tees CAMS which includes the River Tees, and covers the majority of the catchment is unable to be assessed through the Resource Assessment and Management (RAM) due to the regulation of the River Tees by Cow Green Reservoir and Kielder Water reservoir[23]. The area is split into two Water Resource Management Units (WRMUs) and Teesmouth and Cleveland Coast SPA/Ramsar site is listed under the Sherwood Sandstone WRMU. The main use of abstraction of water in the Tees CAMS area is industry, with more than one third from sewage treatment works; the remainder from industrial and business sites. Some water abstraction licences are currently under review[22]. According to the Environment Agency, currently there is water availability for Sherwood Sandstone but the target status for 2014 (estimated decommissioning date for the existing nuclear power station) is that there is no water available for abstraction at low flows.

3.4 The lower section of the River Tees, and its estuary are predominantly urban and industrial in character. Traditional industry has declined in recent years but locally it is still dominated by the chemical and oil

23 Environment Agency (2008). The Tees Catchment Abstraction Management Strategy.

industries where comparatively large quantities of industrial waste are discharged.

3.5 There are increased pressures from cumulative impacts of planned growth in the North East and measures will be required so that there is 'good' ecological status and no deterioration of its water bodies. UK Climate Predictions (previously known as UK Climate Impact Programme 2008) state there will be hotter drier summers, warmer wetter winters and rising sea levels. These predictions will need to be taken into account when assessing the scale of the pressures on the water environment. When considering the scale of pressures from water abstraction with climate change there is a very high increased risk. In contrast, with the scale of pressures from organic pollution or water temperature pressure there is a medium increased risk[24].

3.6 Currently 43% of surface water bodies in this catchment are achieving either good status or good potential. The Environment Agency proposes that by 2015, 49% compliance will be achieved, and this will have improved to 52% by 2027. According to the latest figures (2009) all water bodies have been assessed for ecological status/potential. Surface water quality is generally good although certain stretches assessed as having 'poor' and 'bad' water quality still exist. Radioactive discharges (including potential accidental discharges from radioactive storage) are subject to targets monitored by the Environment Agency and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the Environment Agency in the nuclear sector report[25]). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.

3.7 The Northumbria SPA/Ramsar includes much of the coastline between the Tweed and the Tees estuary and habitats consist of mainly discrete sections of rocky shore with associated boulders and cobble. Recent data for the Northumbria Coast SPA (undertaken using computer modelling) have shown that nutrient enrichment mainly from the cumulative contribution of nitrogen from sewage discharges and other sources, could lead to impacts on habitats used by the internationally important qualifying bird species[26]. Historically, such elevated nutrient levels in the tidal environment may have been beneficial to populations of certain waterbirds on the Tees estuary, through increasing invertebrate prey. The modelled nitrogen level was significantly higher than the threshold levels in many areas. The assessment concluded that the threshold concentration from regulated inputs could not be seen as trivial in some of the coastal areas. However the study concluded that there was no evidence of an adverse ecological effect due to the elevated nutrient levels.

24 Environment agency (2009). River Management Plan Northumbria River Basin District.
25 Environment Agency (2005). Measuring environmental performance: Sector for the nuclear industry.
26 Environment Agency (2008) http://www.environment- agency.gov.uk/static/documents /Business/Nbria_Coast_Factfile.pdf

Effects in Combination with Other Plans and Projects

3.8 Aspects of the following plans and projects could lead to 'in combination' effects on European Sites with regards to water resources and quality (see Appendix 2):

- North East Strategy for the Environment: Increased population could lead to pressure on water quality and resources (reduced water quality may affect invertebrate populations supporting the qualifying bird species).
- North Yorkshire Local Transport Plan: Potential for water pollution due to growth of transport, mineral and timber extraction.
- River Management Plan for Northumbria Basin: Pressures from development to increase abstraction (including fisheries and aquatic invasive and non-native species).
- Projects and major developments such as Victoria Harbour regeneration in Hartlepool, Tees Valley Metro, a Tees Barrage Tidal Power scheme and the Northern Gateway Container Terminal.

3.9 Decommissioning of Hartlepool nuclear power station site: During decommissioning the following has the potential to occur[27]:

- Risks to water through unplanned releases of radioactive materials as a result of accidents;
- Site drainage characteristics may be altered, resulting in the remobilisation of contaminants and suspended solids, including radioactive materials remaining from the operational phase;
- Increased rates of surface runoff can lead to soil erosion and flooding with subsequent changes to surface water hydrology and channel geomorphology in nearby watercourses;
- Earthworks activities may also cause effects upon the distribution and flow of groundwater, which can directly affect the flow of nearby watercourses;
- Accidental spillage of fuels, lubricants and hydraulic fluids from decommissioning and cleaning plant may occur which could enter surface or groundwater;
- There is the potential for contamination to remain on site and pose a risk to groundwater in the long-term following dismantling of the radioactive waste storage, but this is dependent upon how the store is constructed, operated and removed.

3.10 **Given that water abstraction and water quality requirements for Hartlepool are currently unknown, a precautionary approach requires that at the strategic level potential adverse effects be assumed for Northumbria Coast SPA/Ramsar site and Teesmouth and Cleveland Coast SPA/Ramsar until greater site specific detail**

27 BERR (2008). Towards a nuclear policy statement: Applying the proposed SSA criteria: A study of the potential environmental and sustainability criteria.

(including on technology and mitigation measures) is known. The potential for mitigation measures to effectively address the potential adverse effects on site integrity is considered further in the avoidance and mitigation section of this report.

Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze

Teesmouth and Cleveland Coast SPA/ Ramsar

3.11 Teesmouth and Cleveland Coast SPA/Ramsar has seven component SSSIs and a new nuclear development at Hartlepool has the potential to affect four SSSIs. One of these, Seaton Dunes and Commons SSSI, will be directly affected because it lies to the north of the nominated site and it is likely that the cooling water infrastructure would run through this land. The site Nomination Report reports that 'the associated impacts would be temporary and reversible and that engineering options for installing infrastructure would be considered during the detailed design at local level.' Seal Sands SSSI lies to the south of the nominated site, whereas South Gare and Coatham Sands SSSI and Cowpen Marsh SSSI lie approximately 1.5 km from the nominated site, and would therefore be indirectly affected. In addition, the development of the nominated site may also affect SPA bird species through loss of any functional land within the nominated site adjacent to the SPA that may be important for these birds (e.g. high tide roost sites).

3.12 Therefore the development of the nominated site at Hartlepool has the potential to directly and indirectly affect the qualifying interests (breeding and overwintering wildfowl and waders) of these SSSIs comprising the Teesmouth and Cleveland Coast SPA/Ramsar through habitat loss and fragmentation.

3.13 The implications for flood risk and coastal erosion have been reported to have a great effect on wetland and coastal environments and their conservation interest. Sea level change by 2080 in the north east is predicted to be between 80 mm and 660 mm[28]. The Biodiversity Audit for the North East[29] has highlighted saltmarsh, sand dunes and mudflats as priority habitats directly threatened by sea level rise. These habitats are features of Teesmouth and Cleveland Coast SPA/Ramsar site. A study[30] into the effects of coastal squeeze on Teesmouth and Cleveland Coast SPA was undertaken taking into consideration the effects of existing constraints to the landward migration of intertidal habitats. The study concluded that the loss of intertidal habitats is likely to affect the integrity of the Teesmouth and Cleveland Coast SPA/Ramsar site and recommended that a

28 Treweek Environmental Consultants (2007). Draft Appropriate Assessment for the Regional Spatial Strategy for the North East. Although the Regional Spatial Strategy is no longer valid, the AA collates useful reference information relevant to this site
29 North East Biodiversity Forum (2001). The Biodiversity Audit for the North East. English Nature.
30 Black and Veatch (2005). Tidal Tees Flood Risk Management Strategy: Coastal Squeeze Study.

'programme of measures' should provide replacement habitats. The study also reported that the Tees Estuary, its tributaries and the environment (including people and property) within its vicinity are at risk from flooding.

Effects in Combination with Other Plans and Projects

3.14 Aspects of the following plans and projects could lead to 'in combination' effects on European Sites with regards to Habitat (and species) Loss and Fragmentation/ Coastal Squeeze (See Appendix 2:

- Shoreline Management Plan 2: River Tyne to Flamborough Head. In general this management plan area supports the natural development of this European Site. However two of the management areas concluded the following (which may in-combination result in loss of intertidal habitats);
- Coastal squeeze and subsequent net losses of the designated foreshore between North Sands and Hartlepool Headland
- Enhanced scour and/or wave exposure to the SPA/Ramsar features associated with Hartlepool Headland;
- Rural Development Programme for England (2007-2013) North East Implementation Plan, including land take for bioenergy and infrastructure;
- North Yorkshire Local Transport Plan (2006-2011): Increased transport infrastructure is likely to cause additional land for roads, rail, airports and minerals and timber extraction.

3.15 Hartlepool Borough Council Local Development Framework:

- Some policies could have positive effects: To encourage development to be located in more sustainable locations and therefore in the longer term may contribute to some reduced demand for water resources;
- other policies could have potential negative impacts: Increased access to natural assets (recreation) and therefore increased disturbance to the qualifying species.
- Projects such as the Tees Valley Metro, Victoria Harbour regeneration in Hartlepool, and Tees Barrage Tidal Power.

3.16 **At this strategic stage, where detailed development proposals that include the extent of land take (temporary and permanent) are not defined, a precautionary approach requires that potential adverse effects be assumed through habitat (and species) loss and coastal squeeze on Teesmouth and Cleveland Coast SPA/Ramsar sites until greater site specific details (including on technology and mitigation measures) are known. The potential for mitigation measures to effectively address the adverse effect on European Site integrity is considered further in the avoidance and mitigation section of this report.**

Disturbance (Noise, Light, Visual)

Teesmouth and Cleveland Coast SPAS/Ramsar

3.17 It is well documented that Little Terns and other waterfowl are particularly vulnerable to human disturbance[31]. This species is also noted as being specifically threatened by habitat destruction such as the development and industrial reclamation of coastal breeding habitats[32]. The HRA Screening Assessment further noted the potential for disturbance arising from the construction and decommissioning phases to alter foraging, roosting and breeding patterns. Disturbance can therefore result in the displacement of bird species, leading to reductions in their feeding capacity and adverse impacts upon their breeding and survival rates.

3.18 The SSSI units underpinning Teesmouth and Cleveland Coast SPA/Ramsar vary in terms of their condition. For example, Seal Sands which lies in the immediate vicinity of the Hartlepool nominated site is currently only 3.31 % favourable (with 92.35% being unfavourable/no change) but Seaton Sands and Common is 53.38% favourable and South Gare and Coatham Sands is 100% favourable. Given that this potentially reduces the area of alternative habitat that is available to birds away from disturbed areas this could further compound the effects of disturbance on qualifying interests. Even though the full extent and specific nature of the disturbance arising from the development proposal are unknown, it is known that the intertidal area of Seal Sands is especially vulnerable to disturbance of waterbirds.

Effects in Combination with Other Plans and Projects

3.19 Aspects of the following plans and programmes could lead to 'in combination' effects on European Sites with regards to disturbance (see Appendix 2):

The North East Strategy for the Environment:

- Population levels will rise as new housing becomes available and increased tourism this may lead to increased recreation in vicinity of European Sites, with potential disturbance to qualifying bird species.

3.20 Projects such as the Tees Valley Metro, the Victoria Harbour regeneration in Hartlepool, the Tees Barrage Tidal Power Plant, the Able TERRC shipyard, the Conoco Phillips Liquid Natural Gas and the

31 Liley, D. (2008). Little Terns at Great Yarmouth. Disturbance to birds and implications for strategic planning and development control. Unpublished report commissioned by Great Yarmouth Borough Council and RSPB. Footprint Ecology, Wareham, Dorset. Report commissioned by Steve Jones RSPB, Norwich.

32 BirdLife International (2008) Species factsheet: *Sterna albifrons*. [Accessed http://www.birdlife.org on 14/3/2009]

Combined Heat and Power plant proposals may increase disturbance impacts.

3.21 Decommissioning of Hartlepool nuclear power station site:

- Vibration: these include not only the broader impacts of vibration but also in the immediate vicinity and the impacts from any potential blasting operations.

3.22 Given that the nature, location and duration of disturbance events (noise/light/visual) arising from the construction, operational and decommissioning phases of development are currently unknown, a precautionary approach requires that at this strategic level, potential adverse effects be assumed for the Teesmouth and Cleveland Coast SPA/Ramsar site until further information of the development (including details on technology and specific mitigation measures implemented) is obtained. The potential for mitigation measures to effectively address the potential adverse effects on site integrity is considered further in the avoidance and mitigation section of this report.

Air Quality

Teesmouth and Cleveland Coast SPA/Ramsar

3.23 Information provided by the UK Air Pollution Information System[33] indicated that the levels of NOx and SO_2 were within the critical levels for Teesmouth and Cleveland Coast SPA but at the time of searching for this information, no data was available for other pollutants.

3.24 However the Environment Agency assesses that non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority. The Environment Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits[34].

3.25 Air quality issues around Hartlepool could potentially arise during construction and decommissioning phases; however air quality and changes to local and diffuse air quality conditions are not identified as vulnerabilities for Teesmouth and Cleveland Coast SPA/Ramsar site but may indirectly affect the habitats supporting the qualifying birds. In addition, the potential for cumulative effects arising from other plans and projects are unknown bearing in mind that the Environment Agency state that Teesmouth and Cleveland Coast SPA/Ramsar site is reported to

33 http://www.apis.ac.uk/
34 Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).

have reached the critical load in terms of nitrogen deposition and therefore this European Site is susceptible to additional pollution.

Effects in Combination with Other Plans and Projects

3.26 Aspects of the following plans and programmes could lead to 'in combination' effects on European Sites with regards to air quality (see Appendix 2):

- Regional regeneration and growth, including major new heavy industrial, chemicals and port related developments.

3.27 Construction and associated air quality impacts of the proposed building of the Centrica coal fired power station in Teeside:

- An increase in energy generated from proposed biomass schemes
- Cumulative effect of residential, industrial, port and road development in the vicinity.
- Increased air and road traffic may lead to an increase in diffuse air pollution.

3.28 Rural Development Programme for England (2007-2013). North East Implementation Plan Final:

- Increased use of the countryside for recreation may cause additional air pollution

3.29 The Yorkshire and Humber Waste Strategy (2003)

- Increased transport may lead to additional air pollution

3.30 North Yorkshire Local Transport Plan (2006-2011) may lead to air pollution from transport infrastructure - roads, rail, sea ports and waterways, airports, road freight development;

3.31 Hartlepool Local Development Framework: Some policies could have *positive* effects, by aiming to reduce the reliance on the private car and increasing the access to more sustainable forms of transport.

3.32 Decommissioning of the Hartlepool Nuclear Reactor Site. During decommissioning the following has the potential to occur[35]:

- Risks to air quality through unplanned releases of radioactive materials as a result of accidents
- Radioactive gas discharges would continue to occur, although rates would depend upon how decommissioning is undertaken and this would be regulated by the relevant agency.

35 BERR (2008). Towards a nuclear policy statement: Applying the proposed SSA criteria: A study of the potential environmental and sustainability criteria.

- The delivery of infrastructure to facilitate the decommissioning process, the removal of infrastructure from the site and the daily movement of site personnel which would result in increased vehicular movements and the consequential additional emissions of pollutants to the air.
- Demolition of buildings and foundations, construction work and other general activity.
- Following dismantling and decommissioning of the radioactive waste store, there is a potential for long-term adverse effects to air quality.

3.33 **Therefore, in the context of: known air quality conditions; existing plans and (local level) management activities to regulate air pollution impacts; and the European Site characterisation data which indicates that the qualifying features for the European Sites under consideration are vulnerable or at risk for issues of air, particularly at a local level and the possibility of cumulative effects, a precautionary approach requires that at this strategic level, potential adverse effects be assumed for Teesmouth and Cleveland Coast SPA / Ramsar until greater project specific detail (including on technology and mitigation measures) is known. The potential for mitigation measures to effectively address the potential adverse effects on site integrity is considered further in the avoidance and mitigation section of this report.**

Avoidance and Mitigation Measures

3.34 Avoidance and mitigation measures can apply both at a strategic policy level in the form of policy amendments/caveats, and in more detail at project level, where they are specific measures applicable to the identified issues at individual sites. This HRA is being undertaken at a strategic level where there are developmental uncertainties regarding the nature, scale and final footprint of the development of the nominated site. These uncertainties limit the capacity of the HRA to reasonable predict the effects on a European Site[36].

3.35 At this strategic stage, the HRA for Hartlepool can make avoidance and mitigation recommendations in relation to Hartlepool to inform the strategic siting assessment process and therefore the overall development of the Nuclear NPS. These recommendations may also subsequently provide guidance to the IPC and potential future developers to ensure that any future development at Hartlepool takes into account the findings of this strategic level assessment in the more detailed project level HRA.

3.36 The HRA recommendations for avoidance and mitigation measures in relation to Hartlepool are detailed below and summarised in Table 4. Part II of the [main] HRA report also summarises the measures

36 The key principles and any assumptions made in this plan level HRA of the Nuclear NPA and nominated sites are outlined in Part II of the HRA report.

identified in this report alongside those proposed by [other] individual site HRAs.

3.37 This HRA is part of an ongoing assessment process that would continue with detailed, project level HRA to be undertaken at development consent stage, which will be informed by more precise information regarding the development plans for the nominated site at Heysham, including consideration of the impact on local defined habitats not covered by the HRA plan process. Project level HRA, in line with the recommendations made in this strategic assessment may (as a result of project findings) also consider alternative approaches to the development including changes to the nature, scale, technology applied or locational boundaries of the nominated site in order to avoid adverse effect on the site integrity of the European Sites considered.

Water Resources and Quality

3.38 Avoiding adverse effects on surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (abstraction licensing and discharge regulation).

3.39 Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[37] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European Sites should not be permitted. In addition to thermal effects from direct cooling, there are potential water quality issues, in particular nutrient enrichment from anti-fouling agents, which may be associated with the cooling water process.

3.40 Careful design of cooling water culverts should be undertaken to avoid effects of sedimentary processes or thermal regime and should take account of the route length and design of the intake/outfall structures. Fish protection measures should be incorporated into the cooling water intake/system design and thermal discharges should be designed so as to avoid adverse effects.

3.41 The IPC, as guided by the Nuclear NPS, can direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European Sites) are in place prior to the implementation of the nominated site, and that decisions relating to best available technology take specific account of the sensitivities of the individual receiving environments.

37 ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

3.42 Adverse will effectively be mitigated at the site level through suitable design - including use of Sustainable Drainage Systems (SUDS) - and the selection of appropriate construction management methods and discharge standards.

Habitat (and Species) Loss and Fragmentation/Coastal Squeeze

3.43 Proposals for design and build should be required to avoid any direct habitat impacts that may lead habitat loss/fragmentation and/or coastal squeeze.

3.44 In relation to the identified issues at Hartlepool, the Nomination Report[38] states that the nominated site should be sufficiently large to avoid direct land-take from the designated areas for permanent works and any areas affected by construction should be reinstated incorporating appropriate habitat creation, enhancement, management and long-term monitoring. This would mean avoiding or minimising losses of habitats and species (including any areas within the nominated site that may be important to SPA bird species) through site layout and design (for example promoting the use of existing cooling water infrastructure as much as possible or the use of tunnelling techniques to minimise impacts on habitats at the surface), which should be informed by suitable ecological surveys. It could also include sensitively designed sea defences (for example soft engineering for any upgraded coastal protection or use of permeable material for the marine landing facility and the use of modern tunnelling techniques for cabling and remote infrastructure, including cooling water culverts, where appropriate to avoid surface impacts to any sensitive areas of Teesmouth and Cleveland SPA/Ramsar site. Connectivity of important wildlife corridors around the site should be maintained and opportunities for habitat creation, enhancement and provision for birds displaced from areas outside the designated sites (for example, habitats/areas that are known to support qualifying species such as the current power station golf course and field to the east), restoration, enhancement, management and long-term monitoring should be sought where possible and incorporated into the overall mitigation package as good practice.

Disturbance (Noise, Light, Visual)

3.45 Disturbance events in relation to bird species are most significant when they are irregular/ sudden and unpredictable. These impacts are relevant all year round as both important populations of breeding and overwintering birds use the designated sites but these impacts would be most severe during the period November to March[39] due to the numbers of wintering birds (c. 24,486[40]) using the Teesmouth and

38 EDF Energy (2009). Site Nomination Report for Hartlepool: Strategic Siting Assessment for the development of New Nuclear Power Stations in the UK.
39 Comment from Mike Leakey as NE Consultee (May 2009).
40 WeBS Report, Based a five-year mean count.

Cleveland Coast SPA/Ramsar site. Construction activities such as dredging and piling should avoid low tide periods at this time of year. Noise, light and visual impacts can be minimised and managed at a site level through phasing and timing that takes account of breeding and feeding cycles and should be supported by information on flight lines and migration routes as well as feeding and roosting areas. This information is expected to be gathered through further investigation at the site level. The mitigation measures should be included within a construction environmental management plan, and would help to minimise disturbance. The precise detail and the nature of the measures required would need to be agreed with the Statutory Body prior to the commencement of development. These measures would form part of the wider site management plan that developers would be required to agree and implement prior to commencement.

3.46 Avoiding adverse effects on fish/invertebrate species which are food sources for birds is in part influenced by the efficiencies achieved within the industrial process and the nature of the technologies proposed by developments (extent of cooling water requirements). Fish protection measures could be incorporated within cooling water intake/system design that take account of identified fish populations in the estuarine environment around Hartlepool.

3.47 Screening of the works area and control of the workforce will limit disturbance effects on the birds including the timing of activities and use of sympathetic techniques where appropriate to reduce construction noise levels.

Air Quality

3.48 Air quality impacts are not considered as a significant vulnerability for Teesmouth and Cleveland Coast SPA/Ramsar site, however given that this European Site is said to have reached its critical load in terms of nitrogen deposition, the Nuclear NPS should take into account the potential for air quality impacts to arise at a local level. Requirements should include sustainable transport plans including, for example: the use of non-road transport where possible; the phasing of development; and robust monitoring at sites by operators (and the Environment Agency as appropriate) to track changes throughout the lifecycle of proposed operations. In particular, the monitoring should account for the potential for cumulative impacts where the phasing between the existing power station and the new build overlaps.

Table 4: Summary of Avoidance and Mitigation Recommendations

Potential Effects	Suggested Avoidance and Mitigation Measures – Recommendations for the IPC
Water Resources and Quality	
• Water Quality	• Direct requirements for protection of water quality. This may include requiring that management measures relating to supply and discharge take

Potential Effects	Suggested Avoidance and Mitigation Measures – Recommendations for the IPC
	specific account of the sensitivities of the individual receiving environments. • Fish protection measures should be incorporated into the cooling water intake/system design and thermal discharges should comply with existing standards or meet the known deterioration standard. • Careful design of cooling water culverts to avoid effects on sedimentary processes or thermal regime, taking account of route length and design of intake/outfall structures. • Appropriate construction methods should be incorporated into the Construction Environmental Management Plan (CEMP) to minimise the impacts of the development upon water resources and water quality.
• Water Quantity	• Direct requirements for the efficiency of water use. • Ensure that the volume of cooling water returned is within the capacity of the immediate receiving environment and does not adversely affect sediment flow.
• Surface and Groundwater Flow	• Require suitable design to minimise impacts including use of Sustainable Drainage Systems (SUDS).
Habitat Loss and Fragmentation/ Coastal Squeeze	
• Direct Loss	• Avoid direct land-take from the designated areas for permanent works and any areas affected by construction (including use as lay down areas and for parking etc.). Any areas outside designated areas where birds are displaced should be mitigated for (for example habitat enhancement/creation, management and monitoring in the current power station golf course and field to the east). • Reinstatement of any areas affected by temporary construction works and incorporating appropriate habitat creation, management and monitoring.
• Loss of Surrounding Habitat (construction of associated infrastructure)	• Use of modern tunnelling techniques for cabling and remote infrastructure, including cooling water culverts, where appropriate to avoid surface impacts to sensitive areas of Teesmouth and Cleveland Coast SPA/Ramsar site. • Require ecological mitigation and management plan, to link to existing integrated land management plan.
• Barriers to Migration for fish and birds	• Require sensitive design for all coastal defence structures and marine landing facilities which are permeable to sediment flows along the coast. • Maintain connectivity of wildlife corridors around site and seek opportunities for habitat creation, restoration and enhancement.

Potential Effects	Suggested Avoidance and Mitigation Measures – Recommendations for the IPC
Disturbance (Noise, Light, Visual)	
• Construction and Decommissioning	• Minimise need for encroachment of construction into sensitive areas through site design. • Noise, light, visual and other disturbance impacts should be managed at the site level through the appropriate phasing/ timing/ screening of construction (and deconstruction) works. Information on flight lines/ migration routes/ feeding and breeding areas should be used to inform this phasing/timing and the use of sympathetic techniques where appropriate to reduce noise levels, particularly during construction. • Screening of the works area and control of the workforce to limit disturbance effects on birds, including the timing of activities and use of sympathetic techniques where appropriate to reduce construction noise levels.
• Indirect effects (construction associated infrastructure)	• Require the incorporation of fish protection measures within cooling water intake/system design.
Air Quality	
• Construction, Operation and Decommissioning	• Require sustainable transport plans including, for example: the use of non-road transport where possible; the phasing of development and robust monitoring by operators at sites to track changes throughout the lifecycle of the proposed operations. • Promote the use of carbon-efficient forms of transport and construction during the power station lifecycle. • Ensure that monitoring by operators accounts for the potential for cumulative impacts where the phasing between existing power stations and the new build overlaps.

Summary of HRA Findings and Recommendations

3.49 The HRA Screening Assessment identified the likely significant effects on four European Sites as a result of impacts that may arise from the development of a new nuclear power station at the nominated site at Hartlepool. These effects were assessed further through the AA stage of the HRA which considered: European Site data; available environmental condition data; and the potential effects of other plans 'in-combination'; in coming to a conclusion on the likelihood that the development of the nominated site for a new nuclear power station will have an adverse effect on European Site integrity.

3.50 Based on HRA experience, professional judgement, and the consultation advice received from the Statutory Consultees, it is reasonable to conclude that the suggested measures may be sufficient to avoid and/ or mitigate the adverse effects on the integrity of European Sites identified. However, the effectiveness of the measures proposed can only be ascertained with certainty through HRA at a project level, where the specific details of developments and primary data sources will be available

3.51 The conclusions of the HRA are limited by the strategic nature of the assessment process and the information available, which does not allow for a definitive prediction of effects on the European Sites considered. A precautionary approach suggests that AA at this strategic level cannot rule out the potential for adverse effects on any of the four European Sites identified through the screening stage through impacts on water resources and quality, air quality, habitat and species loss and fragmentation and disturbance (noise, light and visual) (see Table 5). This includes, in particular, effects arising from development of cooling water pipework and other infrastructure on areas of the Teesmouth and Cleveland SPA/Ramsar site within the nominated site.

Table 5: Summary of Appropriate Assessment

Potential Effects Arising from Development	European Sites at which adverse effects cannot be ruled out
Water resources and quality	• Northumbria Coast SPA • Northumbria Coast Ramsar • Teesmouth and Cleveland Coast SPA • Teesmouth and Cleveland Coast Ramsar
Air quality	• Teesmouth and Cleveland Coast SPA • Teesmouth and Cleveland Coast Ramsar
Habitat (and species) loss and fragmentation/ coastal squeeze	• Teesmouth and Cleveland Coast SPA • Teesmouth and Cleveland Coast Ramsar
Disturbance (noise, light, visual)	• Teesmouth and Cleveland Coast SPA • Teesmouth and Cleveland Coast Ramsar

3.52 To address the uncertainties inherent in a strategic level HRA, the AA has proposed a suite of avoidance and mitigation measures to be considered as part of any project level HRA (Table 4). At this stage, it is assessed that the effective implementation of these strategic mitigation measures may help to address the identified adverse effects on European Site integrity, but that more detailed project level HRA is required in order to draw conclusions on their efficacy

3.53 Further assessment supported by detailed data at project level, supported by detailed data, is therefore required to determine whether nuclear power development at this nominated site could be undertaken without adversely affecting the integrity of European Sites at Hartlepool.

3.54 Only at the project level HRA can a conclusion of no adverse effect on site integrity be made with any confidence.

Glossary

AA	Appropriate Assessment
AoS	Appraisal of Sustainability
APIS	UK Air Pollution Information System
DECC	Department for Energy and Climate Change
CAMS	Catchment Abstraction Management Strategy
CEMP	Construction and Environmental Management Plan
CCW	Countryside Council for Wales
CHaMPs	Coastal Habitat Management Plans
cSAC	Candidate Special Area of Conservation
EA	Environment Agency
EIA	Environmental Impact Assessment
HRA	Habitats Regulations Assessment
ICZM	Integrated Coastal Zone Management
IPC	Infrastructure Planning Commission
LA	Local Authority
LDF	Local Development Framework
LSE	Likely Significant Effect
LTP	Local Transport Plan
NE	Natural England
NH_3	Ammonia
N2K	Natura 2000 sites
NO_x	Nitrogen Oxides
NPS	National Policy Statement
PPP	Plans, Programmes and Projects
pSPA	Potential Special Protection Area
RAM	Resource Assessment and Management
Ramsar	Wetland Sites designated by the Ramsar Convention
RSPB	Royal Society for the Protection of Birds
SAC	Special Area of Conservation
SO_2	Sulphur Dioxide
SPA	Special Protection Area
SSA	Strategic Siting Assessment
SSSI	Site of Special Scientific Interest

SUDS	Sustainable Drainage Systems
WRMU	Water Resource Management Unit

URN 10D/891

Office for Nuclear Development
Department of Energy & Climate Change
3 Whitehall Place
London SW1A 2AW
www.decc.gov.uk