

# Habitats Regulations Assessment of the revised draft Nuclear National Policy Statement: Main Report

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## Habitats Regulations Assessment of the draft Nuclear National Policy Statement

This document is the Habitats Regulations Assessment of the revised draft Nuclear National Policy Statement including potentially suitable sites. This document reports the revised Habitats Regulations Assessment (including Appropriate Assessment) and takes into account the changes to the draft Nuclear NPS undertaken following the public consultation which took place between November 2009 and February 2010. These strategic assessments are part of an ongoing assessment process that will continue with project level assessments. Applications for development consent will need to take account of the issues identified and recommendations made in the strategic, plan level Habitats Regulations Assessment (including Appropriate Assessment) and include more detailed, project level Habitats Regulations Assessment as necessary.

### The Habitats Regulations Assessment is provided in the following documents:

#### **HRA Non-Technical Summary**

#### **Main HRA Report of the revised draft Nuclear NPS**

- Introduction
- Methods
- Findings

#### **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](http://www.energynpsconsultation.decc.gov.uk)

This document is the **Main Report** of the HRA of the revised draft Nuclear NPS.

This report 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.

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# Non-Technical Summary

## S.1 Introduction

### This HRA Report: Non-Technical Summary

- S.1.1 This is a Non-Technical Summary (NTS) of the Habitats Regulations Assessment (HRA) of the revised draft Nuclear National Policy Statement (NPS). The HRA Report has been prepared to meet the requirement to undertake HRA of plans and projects in accordance with the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations'). This NTS is published alongside the revised draft Nuclear NPS on which the Government is consulting the public.
- S.1.2 The purpose of assessing the revised draft Nuclear NPS is to consider the impacts on nature conservation sites of European importance, of constructing, operating and decommissioning new nuclear power stations in line with the policies and proposals set out in the plan.

### The Planning Act and National Policy Statements (NPS)

- S.1.3 The Government has taken to improve the planning system for major infrastructure projects through its recent planning reforms. These were brought into effect by the Planning Act 2008 which establishes a new single consent regime for nationally significant infrastructure under which the Government will produce NPSs that seek to establish the national case for infrastructure development.
- S.1.4 The Government wants a planning system for major infrastructure which is rapid, predictable and accountable. Planning decisions should be taken within a clear policy framework making these decisions as predictable as possible. The final energy NPSs will be a blueprint for decision-making on individual applications for development consent for the relevant types of infrastructure. The final NPSs will clearly set out Government's policy insofar as it relates to planning applications for major infrastructure and will give investors the certainty they need to bring forward proposals to maintain security of supply and ensure progress towards decarbonisation.
- S.1.5 In line with the Planning Act 2008, the draft energy NPSs were drafted on the basis that once they are designated the Infrastructure Planning Commission will be the decision making body. 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; decisions would be taken by the relevant Secretary of State.
- S.1.6 These proposed reforms will 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 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 clear policy framework for recommendations by the MIPU to the Secretary of State.

### The revised draft Nuclear NPS and the Strategic Siting Assessment (SSA)

- S.1.7 The Nuclear NPS will be the principal document which will set the framework for the IPC in its consideration of applications for development consent for new nuclear power stations. It will set out Government policy on the need for new nuclear infrastructure and how the IPC should balance this need against the impacts of new nuclear power stations. A significant component of the revised draft Nuclear NPS is the list of sites which have been assessed at a strategic level and which Government considers to be potentially suitable<sup>1</sup> for the deployment of new nuclear power stations by the end of 2025.
- S.1.8 The assessment of potential suitability of sites has been undertaken through the Strategic Siting Assessment (SSA) process which considered potential sites nominated into the process by third parties. The SSA process has been subject to public consultation, an Appraisal of Sustainability (AoS), and HRA screening, as part of the overall development of the revised draft Nuclear NPS.

## S.2 The Habitats Regulations Assessment Process

- S.2.1 The European Directive (92/43/EEC) on the Conservation of Natural Habitats and Wild Flora and Fauna (the Habitats Directive) protects habitats and species of European nature conservation importance by establishing a network of internationally important sites designated for their ecological status. These are referred to as Natura 2000 sites or European Sites<sup>2</sup>, and comprise of Special Protection Areas<sup>3</sup> (SPAs), Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSAC), and Sites of Community Importance (SCIs) designated under the EC Habitats Directive. Potential SPAs (pSPAs) and Ramsar sites are included in the assessment in line with Government policy and are also referred to as “*European Sites*”.
- S.2.2 Article 6(3) of the Habitats Directive requires ‘*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 was transposed into UK law by the Habitats Regulations<sup>4</sup>.
- S.2.3 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 As set out in the Planning Act 2008, an NPS may identify one or more locations as suitable (or potentially suitable) or unsuitable for a specified description of development. For the purposes of this document, “deployment of new nuclear power stations” means commencing operation of one or more new nuclear power stations on a site.

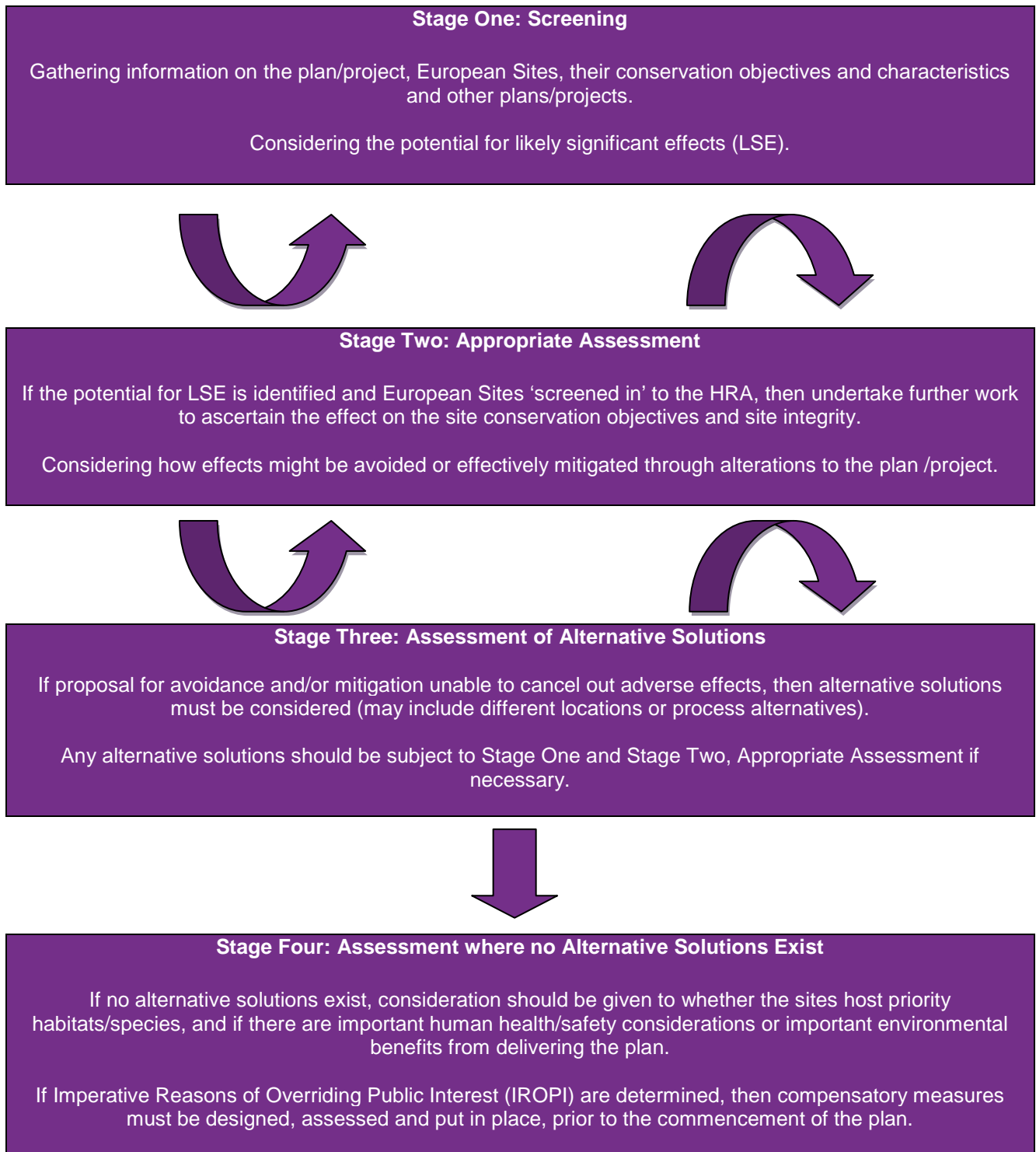
2 All SAC, cSAC, SPA, pSPA, SCIs and Ramsar sites to which the procedures of the HRA apply, are referred to as European Sites in this NTS, the Main HRA Report and throughout all the Site HRA Reports. Details about the different kinds of protected sites can be found here: <http://www.jncc.gov.uk/default.aspx?page=4>.

3 Classified under the EC Birds Directive 1979.

4 The Conservation of Habitats and Species Regulations 2010, SI2010/490. Regulation 106 applies the requirements and controls in relation to plans under the Regulations to National Policy Statements designated under the Planning Act 2008.

Overview of the HRA Process

Figure S.1 Summary of the key stages of HRA



S.2.4 The HRA of the revised draft Nuclear NPS has covered Stages 1 – 4 of the HRA process. As shown in Figure S.1, these stages are iterative and reflect the scope of the assessment possible at a strategic level where site specific information and development uncertainty exists.



## Consultation

- S.2.5 It is a requirement of the Habitats Regulations that in undertaking HRA of the Nuclear NPS, the plan making authority (in this case the Secretary of State) consult the “*appropriate nature conservation body*” (the “statutory consultees”) and have regard to any representations made by that body. In the UK the statutory consultees for nature conservation are: Natural England (NE); the Countryside Council for Wales (CCW); Scottish Natural Heritage (SNH), and the Department of the Environment Northern Ireland (DoENI). Public consultation is a discretionary requirement and the Regulations note that the plan-making authority can, if it considers it appropriate, also take the opinion of the general public into account.
- S.2.6 Table S.1 lists the key consultation steps undertaken in the production of the HRA for the revised draft Nuclear NPS.

Table S.1 Consultation

| Date                       | Stage                                                                                                      | Consultees                                                                                                                                                        |
|----------------------------|------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>June 2008</b>           | Draft HRA Screening Report                                                                                 | Consultation with statutory consultees                                                                                                                            |
| <b>July 2008</b>           | HRA Screening Report                                                                                       | Consultation with statutory consultees. Publication of Screening Report on BERR <sup>5</sup> website <sup>6</sup> and comments from interested parties considered |
| <b>Dec 2008 - Oct 2009</b> | Development of HRA, Methods, Scope of HRA Screening, and AA of nominated sites and draft Nuclear NPS       | Consultation with statutory consultees                                                                                                                            |
| <b>April - Oct 2009</b>    | Draft HRA Reports for Nominated Sites                                                                      | Consultation with statutory consultees                                                                                                                            |
| <b>June 2009</b>           | Draft Main HRA Report for draft Nuclear NPS                                                                | Consultation with statutory consultees                                                                                                                            |
| <b>August - Oct 2009</b>   | Draft HRA Reports for sites identified through the Alternative Sites Study                                 | Consultation with statutory consultees                                                                                                                            |
| <b>Sept – October 2009</b> | Draft Main HRA Report and Non-Technical Summary including IROPI and compensation for the draft Nuclear NPS | Consultation with statutory consultees                                                                                                                            |
| <b>Nov 2009 – Feb 2010</b> | Draft Main HRA Report and Non-Technical Summary accompanying public consultation on draft Nuclear NPS      | Consultation with statutory consultees. Publication on DECC website and comments from interested parties considered                                               |
| <b>October 2010</b>        | Main HRA Report and Non-Technical Summary accompanying public consultation on revised draft Nuclear NPS    | Consultation with statutory consultees. Publication on DECC website. Comments from interested parties will be considered                                          |

5 Following machinery of Government changes in October 2008 responsibility for energy policy (including nuclear) transferred from the Department for Business, Enterprise and Regulatory Reform (BERR) to the Department of Energy and Climate Change (DECC).

6 <http://www.berr.gov.uk/files/file47138.pdf>

## S.3 Developing the Habitats Regulations Assessment

### Options for developing the revised draft Nuclear NPS

- S.3.1 The development of the Nuclear NPS has involved the consideration of different alternatives for delivering the key aims of the plan. Four possible alternatives for the revised draft Nuclear NPS have been considered<sup>7</sup>:
- B1: a Nuclear NPS that includes siting criteria only and has no list of sites;
  - B2: a Nuclear NPS that includes a list of sites and no siting criteria;
  - B3: a Nuclear NPS that includes siting criteria and a list of sites; and
  - B4: a Nuclear NPS that includes siting criteria and a list of sites but restricts sites considered to those in the vicinity of existing nuclear power stations
- S.3.2 These ‘process’ alternatives have been subject to an Appraisal of Sustainability (AoS) and current guidance<sup>8</sup> suggests that it is good practice for the HRA to consider options for the plan delivery that are also being considered by the wider sustainability appraisal and strategic environmental assessment (SEA) processes. Accordingly these alternatives were subject to a strategic level HRA screening.
- S.3.3 The assessment concluded that the likely impact, on European Sites, of constructing new nuclear power stations on potentially suitable sites would be best managed if these sites were identified in line with the policies set out in the Alternative B3 variant of the NPS. This concurs with the conclusion also reached in the AoS, and is the approach that Government has chosen to adopt.

### Options for the Strategic Siting Assessment (SSA) Criteria - Summary of HRA Screening Report July 2008

- S.3.4 The HRA Screening Report (July 2008) considered whether the proposals included in draft Nuclear NPS were likely to have a significant effect on European Sites. As the draft Nuclear NPS was at an early stage, before nominations for potentially suitable sites had been received, the screening focused on the proposed SSA criteria (nuclear safety, environmental protection, societal issues and operational requirements) and assessed whether the locations identified by their implementation would result in significant effects on European Sites. As part of the analysis the screening also summarised the likely impacts and effects arising from new nuclear power stations.
- S.3.5 The report concluded that impacts on biodiversity, flora and fauna as a result of the construction, operation and decommissioning of new nuclear power stations could not be ruled out, and that a further HRA (screening exercise) would need to be undertaken once sites had been nominated, and where necessary, AA should be undertaken. Any AA would need to consider the impacts of new nuclear power stations at nominated sites, either alone, or in-combination with other plans and projects. The results of this early HRA screening, which have informed both the development of the Nuclear NPS and subsequent HRA work were summarised in Chapter 5 of the July 2008 Report.

<sup>7</sup> The process alternatives B1-B4 are identified and discussed in *Applying the Strategic Siting Assessment Criteria: an update to the study of the potential environmental and sustainability effects*, DECC (January 2009).

<sup>8</sup> Department of Communities and Local Government (DCLG) (2006), *Planning for the Protection of European Sites*; Tyldesley D. (2009), *The Habitats Regulations Assessment of Local Development Documents*.

- S.3.6 Following the publication of the HRA Screening Report (July 2008) the Government sought views from the Statutory Consultees. Comments were also invited from interested parties and members of the public. All consultation comments received were reviewed in the context of the screening findings and future work on the HRA.
- S.3.7 The Government's overall response to the comments and how they have informed the development of the NPS was provided in the main Government Response document (January 2009)<sup>9</sup>. The Government received nominations by the end of March 2009, and in line with the recommendations of the July 2008 Screening Report, it undertook HRA Screening and AA of all the nominated sites.

## S.4 The revised draft Nuclear NPS with Potentially Suitable Sites

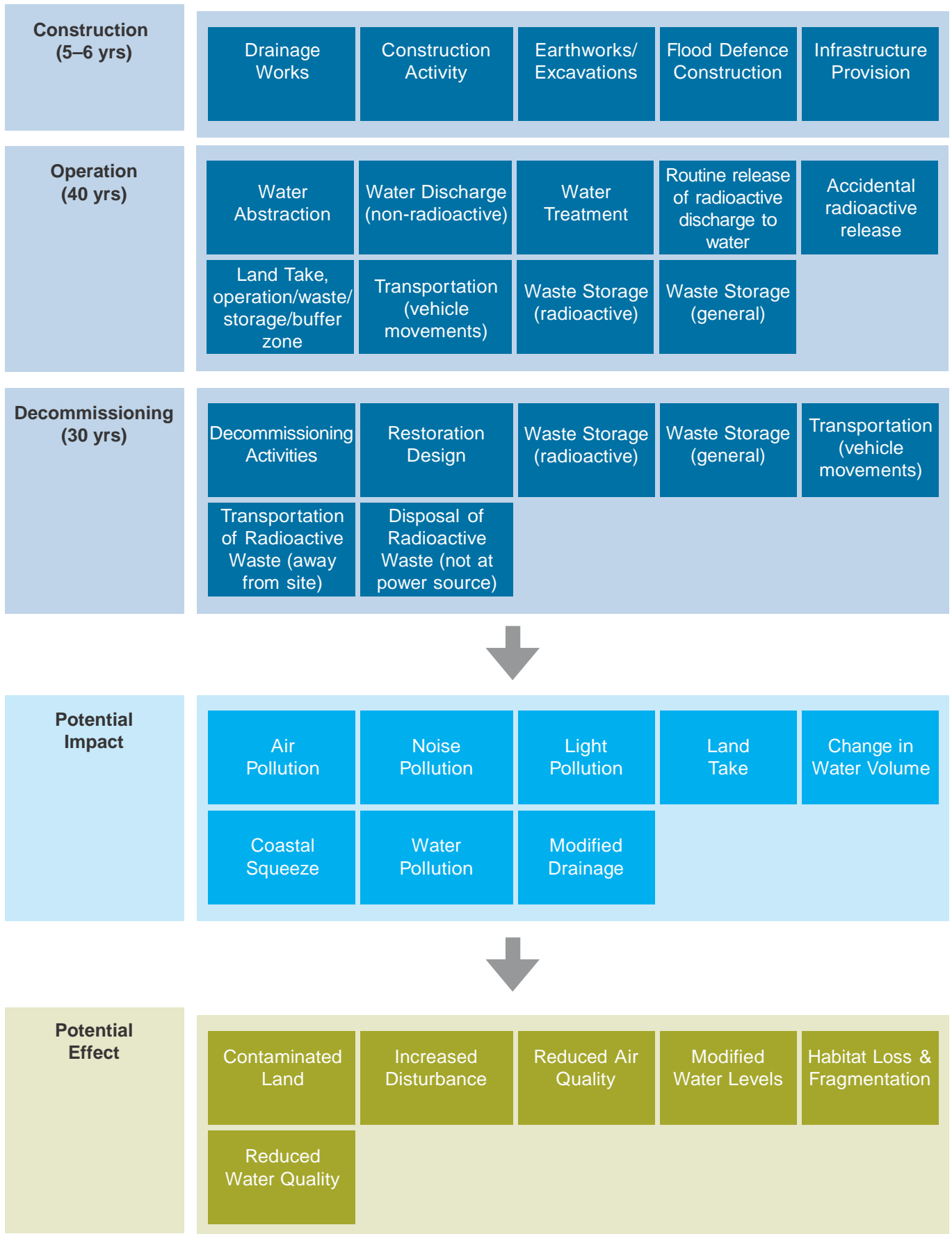
### HRA Screening Findings

- S.4.1 HRA Screening and AA was undertaken on eleven sites nominated into the SSA process. The HRA has been undertaken at the same time, and in consultation with, the SSA process and the Appraisal of Sustainability (AoS) and each workstream has informed the other.
- S.4.2 The July 2008 HRA Screening Report, and the ongoing HRA screening work, that has included consultation input from statutory consultees, identified a range of potential impacts and effects on European Sites arising from the development activities (construction, operation and decommissioning) associated with building new nuclear power stations. The potential activities, impacts and effects are summarised in Table S.2.

---

<sup>9</sup> DECC, (2009) *Towards a Nuclear Policy Statement: Government response to consultations on the Strategic Siting Assessment process and siting criteria for new nuclear power stations in the UK; and to the study on the potential environmental and sustainability effects of applying the criteria*, <http://www.berr.gov.uk/files/file49865.pdf>.

Table S.2 Generic potential impacts and effects of new nuclear power stations on environmental conditions and biodiversity



- S.4.3 Screening of the nominated sites, in accordance with the methods set out in Chapter 2 of the Main HRA Report, provided a more focused analysis of the potential impacts, and therefore the likely significant effects (LSE) arising from new nuclear power stations at locations proposed through the SSA process.
- S.4.4 The screening assessments indicated that development at the nominated sites has the potential for likely significant effects as a result of:
- water resource (discharge, abstraction) and quality impacts;
  - habitat (and species) loss and fragmentation;
  - coastal squeeze;
  - disturbance events (noise, vibration, human activity); and
  - changes to air quality.
- S.4.5 Table S.3 provides a summary of the potential LSE identified across all the European Sites considered by the screening assessment.

**Table S.3 Summary of potential LSE on European Sites**

| Potential Likely Significant Effect                  | Potential impacts arising from new nuclear power stations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
|------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Water resources (discharge, abstraction) and quality | <ul style="list-style-type: none"> <li>• Effluent discharges could result in the build up of heavy metals and salts in receiving water bodies, resulting in the death of aquatic biota and the predators that feed on them.</li> <li>• Uptake and ingestion of toxic compounds from effluent discharges could result in increased vulnerability of species to diseases and genetic mutation, potentially altering reproduction and dispersal rates as a result of endocrine disruption.</li> <li>• Discharge of toxins could bind to particulates and sediment, affecting the physical and chemical quality of habitats such as salt marsh and inter-tidal habitat.</li> <li>• Discharge of high nutrient loads could favour non-native invasive and generalist vegetation species.</li> <li>• Nutrient loading could result in algal blooms and reduced dissolved oxygen in the water column, thereby impacting on both plant and animal species.</li> <li>• Cooling water discharges could further reduce the amount of dissolved oxygen in the water column, and create thermal and chemical barriers to fish migration.</li> <li>• Abstraction and / or addition of water to, or in the vicinity of European Sites (particularly the volume, timing and duration of freshwater flows in rivers and estuaries) could affect fish migration and spawning. It could also alter the structure of physical habitats and compromise aquatic plant and invertebrate communities.</li> <li>• Changes to groundwater levels as a result of abstraction and / or</li> </ul> |

| Potential Likely Significant Effect                          | Potential impacts arising from new nuclear power stations                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|--------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                              | <p>discharge of water could result in altered base flows in rivers, or impact water levels in important habitats (e.g. marshes).</p> <ul style="list-style-type: none"> <li>• Where European Sites are hydrologically connected, there is the potential to transfer direct and indirect impacts between sites.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| <p>Habitat (and species) loss and fragmentation</p>          | <ul style="list-style-type: none"> <li>• Direct land take (development of the site itself, construction laydown areas, cooling water infrastructure etc.), induced and ancillary developments (for example transport infrastructure) and the construction and maintenance of flood defences could result in the direct loss and degradation of estuarial, mud flat, sand flat and salt meadow qualifying habitat.</li> <li>• Habitat loss and fragmentation could result in the displacement of migratory birds from suitable breeding, roosting and foraging grounds to alternate areas. This may have synergistic effects by increasing competition for food resources elsewhere within the European Sites.</li> <li>• Indirect effects are possible from potentially increased sediment and nutrient loads (especially during the construction phase), and from the creation of thermal (for example discharge of cooling water), chemical (e.g. discharge of poor quality water) and physical (e.g. flood defences) barriers to migration and dispersal.</li> <li>• Where geomorphological processes (e.g. transfer and movement of sediment) that uphold levels of nutrient and sediment input and output are modified, qualifying habitat features such as estuaries, salt meadows and reefs could be affected.</li> <li>• Species loss could occur as a result of cooling water intake screens and the entrainment of fish and invertebrate larvae and spores during abstraction.</li> <li>• Where European Sites are connected, there is the potential for synergistic effects between sites. For example, effects on fish at one site may significantly alter otter populations at another site by altering the quality and quantity of food resources.</li> </ul> |
| <p>Coastal squeeze</p>                                       | <ul style="list-style-type: none"> <li>• Coastal squeeze impacts are closely related to habitat (and species) loss and fragmentation, and relate to situations where the coastal margin is squeezed by a fixed landward boundary – mainly through flood and sea defences, and reinforcement of coastal margins through hard engineering.</li> <li>• Coastal squeeze could prevent and / or alter the natural transport and movement of coastal material, and impact on species, communities and habitats.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
| <p>Disturbance events (noise, vibration, human activity)</p> | <ul style="list-style-type: none"> <li>• Disturbance events occur during all phases (i.e. construction, operation and decommissioning) of new nuclear power stations from construction traffic, intermittent machinery, vehicle and plant sounds and the influx of a large workforce.</li> <li>• The most disturbing activities are irregular, unpredictable and loud</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |

| Potential Likely Significant Effect | Potential impacts arising from new nuclear power stations                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|-------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                     | noise events, and vibrations of long duration. These could impact on the behaviour, reproductive success and distribution of migratory fish species.                                                                                                                                                                                                                                                                                                                                                           |
| Air Quality                         | <ul style="list-style-type: none"> <li>• Changes to air quality as a result of emissions from nuclear power stations, although low, could lead to soil enrichment and increased soil and water acidity at European Sites as a result of the deposition of nitrogen and sulphate respectively.</li> <li>• Radioactive emissions (e.g. Noble Gases, Tritium) from nuclear power stations are strictly regulated and within parameters assessed as unlikely to cause harm to humans or European Sites.</li> </ul> |

S.4.6 The HRA screening concluded that for European Sites where the potential for likely significant effects from one or more identified impacts could not be ruled out, AA should be undertaken to assess whether the effects were likely to be adverse for European Site integrity. Although the HRA screening generally concluded that there would not be likely significant effects on European Sites as the result of changes to air quality, the assessments applied the ‘precautionary principle’, and recommended that further information should be gathered as part of the AA to address the potential uncertainties identified in relation to the effect of air quality changes on European Sites.

S.4.7 The site level HRA Reports present the results of the screening assessment for all the European Sites at the nominated sites and the conclusions for the eight potentially suitable sites are summarised in Chapter 6 of the Main HRA Report.

### Appropriate Assessment Findings

S.4.8 The AA considered in more detail whether the potential LSE identified through the HRA screening process [changes to water quality and resources (abstraction and discharge), habitat (and species) loss and fragmentation, coastal squeeze and disturbance events] could have adverse effects on the integrity of the European Sites identified, taking into account the potential for in-combination effects that may arise from other plans and projects that have spatial connections. At all the nominated sites the HRA identified the potential for adverse effects on European Site integrity. At one site the HRA findings indicated that it was unlikely that identified adverse effects in relation to habitat loss could be mitigated or compensated. This site has not been included in the list of potentially suitable sites in the revised draft Nuclear NPS.

S.4.9 A list of the European Sites where the AA concluded that there is potential for adverse effects on European Site integrity as a result of new nuclear development, is provided in relation to the eight potentially suitable sites, in Table S.4.

Table S.4 Summary European Sites at which adverse effects on site integrity cannot be ruled out at plan level

| Potentially Suitable Site     | European Sites at which adverse effects on site integrity cannot be ruled out at plan level                                                                                                                                                                                                                                                    |
|-------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>South West Region</b>      |                                                                                                                                                                                                                                                                                                                                                |
| <b>Hinkley</b>                | <ul style="list-style-type: none"> <li>• Severn Estuary SAC / SPA / Ramsar</li> <li>• River Wye SAC</li> <li>• River Usk SAC</li> </ul>                                                                                                                                                                                                        |
| <b>Oldbury</b>                | <ul style="list-style-type: none"> <li>• River Wye SAC</li> <li>• Severn Estuary SAC / SPA / Ramsar</li> <li>• River Usk SAC</li> </ul>                                                                                                                                                                                                        |
| <b>North West Region</b>      |                                                                                                                                                                                                                                                                                                                                                |
| <b>Heysham</b>                | <ul style="list-style-type: none"> <li>• Leighton Moss SPA / Ramsar</li> <li>• Morecambe Bay SAC / SPA / Ramsar</li> </ul>                                                                                                                                                                                                                     |
| <b>Sellafield</b>             | <ul style="list-style-type: none"> <li>• Drigg Coast SAC</li> <li>• River Ehen SAC</li> <li>• Wast Water SAC</li> <li>• River Derwent and Bassenthwaite SAC</li> </ul>                                                                                                                                                                         |
| <b>North East Region</b>      |                                                                                                                                                                                                                                                                                                                                                |
| <b>Hartlepool</b>             | <ul style="list-style-type: none"> <li>• Northumbria Coast SPA / Ramsar</li> <li>• Teesmouth and Cleveland Coast SPA / Ramsar</li> </ul>                                                                                                                                                                                                       |
| <b>East of England Region</b> |                                                                                                                                                                                                                                                                                                                                                |
| <b>Bradwell</b>               | <ul style="list-style-type: none"> <li>• Abberton Reservoir SPA / Ramsar</li> <li>• Blackwater Estuary SPA / Ramsar</li> <li>• Dengie SPA / Ramsar</li> <li>• Essex Estuaries SAC</li> <li>• Mid-Essex Coast SPA / Ramsar</li> <li>• Outer Thames Estuary SPA</li> </ul>                                                                       |
| <b>Sizewell</b>               | <ul style="list-style-type: none"> <li>• Alde-Ore and Butley Estuaries SAC</li> <li>• Alde-Ore Estuary SPA / Ramsar</li> <li>• Minsmere to Walberswick SPA / Ramsar</li> <li>• Minsmere to Walberswick Heaths and Marshes SAC</li> <li>• Orfordness-Shingle Street SAC</li> <li>• Outer Thames Estuary SPA</li> <li>• Sandlings SPA</li> </ul> |
| <b>Wales</b>                  |                                                                                                                                                                                                                                                                                                                                                |
| <b>Wylfa Peninsula</b>        | <ul style="list-style-type: none"> <li>• Cemlyn Bay SAC</li> <li>• Menai Strait and Conwy Bay SAC</li> <li>• Ynys Feurig, Cemlyn Bay and the Skerries SPA</li> <li>• Liverpool Bay pSPA</li> <li>• Lavan Sands SPA</li> <li>• Puffin Islands SPA</li> </ul>                                                                                    |



- S.4.10 The AA concluded that no adverse effects were likely on European Sites as the result of changes to air quality that may arise as a result of emissions from new nuclear power stations.
- S.4.11 In the absence of more detailed information, and in applying the precautionary principle, potential adverse effects at the European Sites listed above cannot be ruled out.
- S.4.12 The site level HRA reports (which form Annexes A-H to the Main HRA Report)<sup>10</sup> present the full results of the AA for all the European Sites considered in relation to the eight potentially suitable sites. The conclusions are summarised in Chapter 6 of the Main HRA Report.

**Revised draft Nuclear NPS In-combination Effects**

- S.4.13 The site level HRA reports identified and considered as an integral part of the assessment process, the potential for other plans and projects to have effects<sup>11</sup> ‘in-combination’ with the potentially suitable sites. Table S.5 provides examples of the types of plans and projects considered through the in-combination assessment for nominated sites.

**Table S.5 Plans and projects that may act ‘in-combination’ with the revised draft Nuclear NPS**

| Impact                                                               | Plans and Projects In-Combination                                                                                                                                                      |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources (discharge, abstraction) and quality</b>          | River Basin Management Plans, Catchment Abstraction Management Strategies, strategic planning <sup>12</sup> , Renewable Energy Projects (e.g. any possible Severn Tidal Power project) |
| <b>Habitat (and species) loss, fragmentation and coastal squeeze</b> | Strategic planning, Shoreline Management Plans, Joint Infrastructure Plans, Renewable Energy Projects (for example possible Severn tidal power project)                                |
| <b>Disturbance events (noise, vibration, human activity)</b>         | Strategic planning, Local Development Frameworks, Tourism/ Recreation Strategies, Renewable Energy Projects (for example possible Severn tidal power project)                          |
| <b>Air Quality</b>                                                   | Strategic planning, Local Transport Plans                                                                                                                                              |

- S.4.14 The site level HRA Reports also considered the potential for in-combination effects of proposed new nuclear power stations with one another, particularly for regional ‘clusters’ of potentially suitable sites as they occur in the Severn Estuary and the East of England. Table S.6 lists those European Sites that could potentially be affected by more than one potentially suitable site.

<sup>10</sup> The HRA site reports are available at [www.energyngpsconsultation.decc.gov.uk](http://www.energyngpsconsultation.decc.gov.uk)

<sup>11</sup> While the assessment of in-combination effects focused on the potential for negative effects, where relevant potential positive effects for European site integrity arising through the implementation of other plans and projects, were also identified.

<sup>12</sup> “Strategic planning” refers to planning initiatives where local authorities are working in collaboration with other local authorities to deliver at a geographical scale above the local authority tier.

Table S.6 European Sites that are potentially affected by more than one nominated site proposal

| European Site at which adverse effects cannot be ruled out at plan level | Potentially suitable sites   | Effect themes                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| River Wye SAC<br><br>Severn Estuary SAC / SPA / Ramsar                   | Hinkley Point<br><br>Oldbury | <ul style="list-style-type: none"> <li>• water discharge and abstraction</li> <li>• habitat (&amp; species) loss and fragmentation</li> <li>• coastal squeeze</li> <li>• disturbance (noise vibration, human activity)</li> </ul> |
| Outer Thames Estuary SPA                                                 | Bradwell<br><br>Sizewell     | <ul style="list-style-type: none"> <li>• water discharge and abstraction</li> <li>• habitat (&amp; species) loss and fragmentation</li> <li>• disturbance (noise vibration, human activity)</li> </ul>                            |

S.4.15 The HRA of the revised draft Nuclear NPS noted that where strategic plans or projects are implemented in spatially related areas to the revised draft Nuclear NPS (for example adjacent to or within the influence of potentially suitable sites) and in similar timescales, there is the potential for in-combination effects to occur at the European Sites considered in this HRA.

S.4.16 Given the strategic nature of the assessment and the uncertainties surrounding the timing and effects of other national level plans and projects, it is not practicable to identify all the possible plans and projects that may act ‘in-combination’ or to consider the specific nature of likely effects arising. However, it is possible to outline at a strategic level the broad types of effects that may arise from the implementation of other plans and projects which should inform the overall implementation of the revised draft Nuclear NPS. These effects are summarised in the Main HRA Report.

**Avoidance and Mitigation Measures**

S.4.17 This HRA was undertaken at a strategic level where there are a number of development uncertainties including:

- the location of: finalised boundaries; marine off-loading site(s); and cooling towers, the extent and location of induced and ancillary developments, and the location of additional sea defences;
- reactor type(s) and numbers; and
- discharges and emissions to be authorised.

S.4.18 At a strategic level, recommendations for avoidance and mitigation have been made to inform the revised draft Nuclear NPS in the guidance it provides to the IPC. The recommendations also provide guidance to potential developers to ensure that any future developments take into account the findings of this strategic level assessment in more detailed project level HRAs. Should project level findings determine that there are adverse effects on European Site integrity which cannot be addressed by the avoidance and mitigation measures recommended here, then changes to the development design may be

required by the developer in consultation with the IPC, to meet the conditions for planning consent.

S.4.19 The site level HRA reports have proposed a series of avoidance and mitigation measures in relation to the identified impacts and effects at individual European Sites. It is recommended that the requirement for these measures is noted in the revised draft Nuclear NPS for consideration by the IPC. The key measures are outlined in Chapter 6 of the Main HRA Report and summarised below in relation to the main effect themes:

- water discharge, abstraction and quality;
- habitat (and species) loss and fragmentation / coastal squeeze;
- disturbance events (noise, vibration, human activity); and
- air quality.

#### Water discharge, abstraction and quality

S.4.20 Avoiding the adverse effects of water discharge and abstraction from new nuclear power stations on European Sites is the responsibility of the developer, and is subject to regulations enforced by the Environment Agency. All discharges that would lead to adverse impacts on the integrity of European Sites should not be permitted.

S.4.21 Where direct intake would lead to adverse impacts on the integrity of European sites, the use of cooling towers should be considered in preference to direct intake methods if the environmental impacts arising from cooling towers can be more effectively avoided or mitigated. Where direct cooling is required, cooling water culverts should be designed to avoid effects on the existing thermal and sediment transport regimes of estuarial and coastal waters.

S.4.22 Water use efficiency measures should be encouraged in new nuclear power stations to reduce water consumption.

S.4.23 The use of Sustainable Drainage Systems (SuDs) should be encouraged to minimise the impact of surface run-off and on-site erosion.

#### Habitat (and species) loss and fragmentation / coastal squeeze

S.4.24 Direct loss of habitat / coastal squeeze through land take should be mitigated through:

- site layout / design avoiding qualifying habitat;
- utilising soft engineering techniques (e.g. habitats to stabilise banks);
- allowing for habitat connectivity via wildlife corridors; and
- the development and implementation of environmental management plans to minimise direct and indirect impacts on habitats and species, and to link these plans to existing protection mechanisms and plans (such as Site Management Plans).

S.4.25 Physical, chemical and thermal barriers should be mitigated through:

- works being appropriately screened with height restrictions implemented to limit migratory path disturbance;
- minimising the extent of cooling water culverts and reducing the impact of thermal plumes; and
- incorporating fish protection measures within the cooling water intake / system design.

#### Disturbance (noise, vibration, human activity)

S.4.26 Disturbance caused by new nuclear power stations during construction, operation and decommissioning should be mitigated through:

- requirement for appropriate technologies to limit impacts on fish and bird populations;
- phased development to take into account breeding and feeding cycles and habitats, and the flight lines and migration routes of sensitive species including birds, fish and otters; and
- developing and applying environmental management plans to limit disturbance impacts on site integrity.

#### Air Quality

S.4.27 The potential effects of changes to air quality on European Sites should be mitigated through:

- the development and implementation of sustainable transport plans;
- phased development to minimise emissions and dust generation;
- a requirement for emissions to be offset where appropriate; and
- development and implementation of appropriate air quality management plans.

S.4.28 Although a regulatory regime is in place to ensure that radioactive emissions from new nuclear build will be within authorised limits, a number of measures can be applied to ensure further mitigation including:

- the application of Best Available Technology (BAT);
- ensuring that cumulative effects are considered within management plans;
- the requirement for radioactive emissions to be As Low As Reasonably Achievable (ALARA); and
- the requirement that any emissions which lead to adverse effects on European Sites will not be permitted by the relevant regulatory authority.

### Summary Findings: HRA of the revised draft Nuclear NPS

- S.4.29 The HRAs of each potentially suitable site have, through screening and AA, considered the potential for likely significant effects (LSE) on European Sites and the likelihood that the effects identified may have an adverse effect on European Site integrity. It was concluded that at each of the potentially suitable sites, adverse impacts on the integrity of European sites could not be ruled out.
- S.4.30 The site level HRA reports have detailed, as far as is possible on the basis of the current strategic-level information, the nature of the issues at each site and the types of avoidance and mitigation measures that should be considered. It was considered 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.
- S.4.31 The measures, which are presented as recommendations in the site level and Main HRA reports, are referenced in the revised draft Nuclear NPS to provide guidance to the IPC.

### Consideration of Alternative Solutions

- S.4.32 The Habitats Directive requires that where the assessment undertaken in accordance with Article 6(3) (Stages 1 and 2 of the HRA process outlined in Figure S.1) produces findings that are negative or uncertain, then the plan maker must consider whether there are alternative solutions for delivering the aims of the plan that better respect the integrity of the European Site(s) in question. In the light of the HRA findings presented in the Main HRA Report, the Government identified and assessed alternative solutions.
- S.4.33 The Government commissioned Atkins Ltd to produce a study to identify whether there are further sites in England and Wales that are potentially suitable for the deployment of new nuclear power stations by the end of 2025. The study identified three sites worthy of further consideration. HRA of the three sites was undertaken as one aspect of this further consideration and the findings indicated the potential for adverse effects on European Site integrity, and provided recommendations for avoidance and mitigation measures. In line with the HRA findings for the eight potentially suitable sites, it was considered 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.
- S.4.34 The Government concluded on the basis of its further assessment that these sites are not in fact alternatives because it is considered that new nuclear power stations could not be deployed on them by the end of 2025. The sites have not been included in the revised draft Nuclear NPS.
- S.4.35 The Government also considered alternatives as part of the IROPI process described below.

### Imperative Reasons of Overriding Public Interest (IROPI)

- S.4.36 Because of the urgent need to reduce carbon dioxide emissions in order to avoid significant, long-term adverse environmental, social and economic consequences, whilst maintaining security of energy supply and preserving public safety and public health, the Government believes that nuclear power generation (as a proven low carbon technology) needs to be part of the future low carbon electricity generation mix.
- S.4.37 The Government has concluded after analysis that nuclear power stations are needed in order for it to meet its climate change and energy security objectives. There is therefore a need to allow energy companies to build new nuclear power stations because alternative technologies or approaches will not meet this need.
- S.4.38 The Government has considered the 11 nominated sites against strategic siting assessment criteria, Appraisal of Sustainability and a Habitats Regulations Assessment, and concluded that eight are potentially suitable for the development of new nuclear power stations. It has considered whether any non-nominated sites might be considered to be potentially suitable, but has concluded that there are none that meet the SSA criteria and can be shown to be capable of deployment before the end of 2025.
- S.4.39 Given the urgent need for new nuclear power stations and the fact that the Government does not believe that there are any other sites that meet the criteria to be considered potentially suitable for new nuclear development, the Government has concluded that it is necessary to include all of the eight potentially suitable sites in the Nuclear NPS. This therefore provides sufficient flexibility for developers to meet the urgent need for new nuclear power stations whilst enabling the IPC to refuse consent should it consider it appropriate to do so.
- S.4.40 The Government has concluded after analysis that a Nuclear NPS which lists sites is the most effective way of providing certainty for energy companies to make the necessary investments in new nuclear power stations. The alternatives of not having an NPS, or having an NPS constructed in a different way, would not be compatible with the Government objectives, which require rapid de-carbonisation of the generation mix.
- S.4.41 The Government is therefore satisfied that there are IROPI in listing these eight sites in the NPS as potentially suitable sites for development (subject to the IPC's detailed consideration of the proposals for any site on which an application comes forward) even though at this stage potential adverse impacts on European sites cannot be ruled out. This IROPI case is based on fulfilling the Government's energy policy objectives whilst contributing to wider EU goals for sustainable low-carbon sources of energy as a means of reducing the damaging effects of climate change and ensuring security of energy supplies.
- S.4.42 Development proposals will, among other things, need to show that any potential damage to European Sites is fully mitigated, or if, at that stage, adverse impacts are confirmed in respect of development on one of the listed sites, then the developer will be required to follow the requirements set out by the Habitats Directive, including, if necessary, consideration of alternatives at the project level, consideration of IROPI and the development and implementation of compensatory measures in line with the strategic measures set out below. [The Government's findings in respect of Article 6\(4\) of the Habitats Directive and this NPS do not automatically transfer directly to individual projects](#) and the Nuclear NPS does not in any way reduce the duty on the IPC to fulfil the legal requirements of the Habitats Directive.

## Compensation and Monitoring

- S.4.43 Article 6(4) of the Habitats Directive requires that where, in spite of a negative assessment on European site(s) integrity, the competent authority proceeds with the plan on the basis of IROPI, any necessary compensatory measures are taken to ensure that the overall coherence of the Natura 2000 network is protected.
- S.4.44 Given the strategic nature of the HRA process for this NPS, the inherent uncertainties of the AA conclusions, and the potential changes that may occur as the plan is implemented<sup>13</sup>, it is not possible at this stage to specify the precise nature or location of any compensation measures that might be required. The role of the plan is, therefore, to provide a robust framework for compensation through the direction it provides to the IPC. Chapter 7 of the Main HRA Report sets out the broad parameters for compensation measures, should they be required following the more detailed site level assessments undertaken for plan implementation.
- S.4.45 Monitoring assists in the examination of the potential effects identified by the HRA process against the actual effects that occur through the implementation of the NPS. The potential effects on biodiversity should be considered through the existing monitoring frameworks of the environmental regulators who have a statutory role to protect biodiversity. Specific monitoring of trends in a site's qualifying features, in addition to that already undertaken by statutory bodies, should be identified at project level by the IPC, statutory bodies and developers. It should be implemented, enforced and reported (at agreed suitable intervals) to provide useful feedback for project implementation.
- S.4.46 Requirements for monitoring set by the IPC and statutory bodies should consider the potential for cumulative, in-combination effects identified in the HRA (particularly with nuclear power stations at other spatially related sites, the decommissioning of existing power stations at potentially suitable sites and other energy developments).

## S.5 Next Steps

- S.5.1 The revised draft Nuclear NPS is available for public consultation for 14 weeks from the date of publication. This NTS, the Main HRA report and the site level HRA Reports are available, alongside the revised draft Nuclear NPS, at [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)
- S.5.2 The Government is specifically seeking views on the Main HRA Report and site level HRA Reports from Natural England, the Countryside Council for Wales, the Department of the Environment's Environment and Heritage Service (Northern Ireland) and Scottish Natural Heritage. The Government will also consider views from any other interested parties received during the consultation period prior to amending the revised draft Nuclear NPS for ratification by Parliament and then finalising the Nuclear NPS for adoption.

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<sup>13</sup> The HRA of the NPS has noted that avoidance and mitigation measures proposed by the assessment may minimise effects (to the point where integrity is no longer affected) or cancel out the negative impacts predicted such that the site level developments may proceed without the need to meet additional requirements under the Habitats Directive.

# This Habitats Regulations Assessment Report

This Habitats Regulations Assessment (HRA) Report sets out the methods and findings of the HRA undertaken of the revised draft Nuclear National Policy Statement (NPS). The Report updates the findings of the HRA taking into account the changes to the draft Nuclear NPS following the consultation period November 2009 – February 2010. The HRA examines the potential impacts on nature conservation sites of European importance, of proposals to construct, operate and decommission new nuclear power stations at the potentially suitable sites listed in the revised draft Nuclear NPS.

**Section A** of this HRA Report provides an introduction to the background, methods and development of the HRA of the revised draft Nuclear NPS.

**Chapter 1** outlines the policy context for the revised draft Nuclear NPS, the Government's preferred policy approach, and the development of the revised draft Nuclear NPS through the Strategic Siting Assessment (SSA).

**Chapter 2** sets out the requirement for HRA, the HRA process and the methods used for assessment.

**Chapter 3** details the development of the HRA prior to this Report including the HRA screening of four alternative forms of NPS considered in the development of the draft Nuclear NPS, and the HRA screening (July 2008) which considered the potential for likely significant effects (LSE) on European sites of applying the proposed Strategic Siting Assessment (SSA) criteria to sites nominated into the SSA process. This chapter also summarises the relationship of the HRA work with the Appraisal of Sustainability (AoS), including the findings of the AoS on waste, as relevant to the HRA process

**Section B** of this HRA Report sets out the findings of the HRA of the revised draft Nuclear NPS.

**Chapter 4** presents the HRA screening findings of the potentially suitable sites and summarises the recommendations detailed in the site level HRA reports. For European Sites where the screening identified the potential for likely significant effect (LSE) a more detailed Appropriate Assessment (AA) is recommended.

**Chapter 5** presents the findings of the Appropriate Assessment (AA) stage of the HRA. This chapter collates the key findings from individual site level HRA reports and provides summary recommendations for the Infrastructure Planning Commission (IPC) to support more detailed HRA at project level. These recommendations have informed the revised draft Nuclear NPS in the guidance it provides to the IPC.

**Chapter 6** summarises the HRA of alternative solutions to the potentially suitable sites, undertaken in line with the requirements of Article 6(4) of the Habitats Directive. The findings of the assessment process and the Government's conclusions in relation to the delivery of the revised draft Nuclear NPS are outlined.



**Chapter 7** outlines the Government's Imperative Reasons of Overriding Public Interest (IROPI), including the consideration of the zero alternative of not having a plan, for why the plan should proceed given the findings of the HRA presented in chapters 5 and 6. This chapter also sets out a strategic framework for compensation measures in accordance with the provisions of Article 6(4) of the Habitats Directive.

**Chapter 8** outlines an approach for monitoring and provides examples of specific aspects of European Site condition that could form part of future monitoring frameworks based on the strategic level HRA findings presented in this Main HRA Report.

# **SECTION A: INTRODUCTION TO THE HABITATS REGULATIONS ASSESSMENT OF THE REVISED DRAFT NUCLEAR NATIONAL POLICY STATEMENT**

# 1. The revised draft Nuclear National Policy Statement

**This chapter sets out the policy context and background to the development of the revised draft Nuclear National Policy Statement.**

## 1.1 The Planning Act 2008 and National Policy Statements

- 1.1.1 The Planning Act 2008 is intended to provide for a more efficient, transparent and accessible planning system for nationally significant transport, energy, water, waste and waste-water infrastructure projects. The Government wants a planning system for major infrastructure which is rapid, predictable and accountable. Planning decisions should be taken within a clear policy framework making these decisions as predictable as possible. The final energy National Policy Statements (NPS) will be a blueprint for decision-making on individual applications for development consent for the relevant types of infrastructure. The final NPSs will clearly set out Government's policy insofar as it relates to planning applications for major infrastructure and will give investors the certainty they need to bring forward proposals to maintain security of supply and ensure progress towards decarbonisation.
- 1.1.2 In line with the Planning Act 2008, the draft energy NPSs were drafted on the basis that once they are designated the Infrastructure Planning Commission will be the decision making body. 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; decisions would be taken by the relevant Secretary of State.
- 1.1.3 These proposed reforms will 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 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 clear policy framework for recommendations by the MIPU to the Secretary of State.

## 1.2 The Energy National Policy Statements

- 1.2.1 The revised draft Nuclear NPS is one of a suite of energy NPSs (Figure 1.1). The Overarching NPS for Energy is underpinned by five further technology specific NPSs for the energy sector (Fossil Fuel Electricity Generating Infrastructure; Renewable Energy Infrastructure; Gas Supply Infrastructure and Gas and Oil Pipelines; Electricity Networks Infrastructure and the Nuclear NPS). The Overarching NPS for Energy sets out, at a strategic level, Government policy for the control of major energy infrastructure including policies to address security of supply, the reduction of carbon emissions, the need for new generating capacity and a mix of technologies. This will allow the IPC to concentrate on the potential impacts and effects of the development at the proposed location(s), and whether applications should be granted consent. The Overarching Energy NPS provides assessment principles for the IPC in dealing with generic impacts of development; the technology specific NPSs provide guidance on impacts that are particular to individual technology types.
- 1.2.2 The Nuclear NPS has been drafted to guide the IPC in its consideration of development consent applications for new nuclear power stations.

Figure 1.1: Energy National Policy Statements

|                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                       |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Overarching Energy NPS</b></p> <ul style="list-style-type: none"> <li>– Government energy policy</li> <li>– Setting out and justifying the overall need case.</li> <li>– More detailed information about the need and policy for specific technologies</li> <li>– Key generic assessment principles, matters the IPC should and shouldn't consider and locational considerations and impacts that cut across different NPSs/technologies</li> </ul> |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                       |
| <p><b>Fossil Fuel Generating Stations NPS</b></p> <p>Introduction<br/>Locational considerations and assessment of impacts</p> <ul style="list-style-type: none"> <li>a) Coal-fired power stations</li> <li>b) Gas-fired power</li> </ul>                                                                                                                                                                                                                  | <p><b>Renewable Electricity Generation NPS</b></p> <p>Introduction<br/>Locational considerations and assessment of impacts</p> <ul style="list-style-type: none"> <li>a) Energy from Waste and Biomass</li> <li>b) Offshore Wind</li> <li>c) Onshore Wind</li> </ul> | <p><b>New Nuclear Energy NPS</b></p> <p>Introduction<br/>Assessment Principles<br/>Impacts and general site considerations<br/>Potentially suitable sites for new nuclear development</p> | <p><b>Oil and Gas Transmission and Storage NPS</b></p> <p>Introduction<br/>Locational considerations and assessment of impacts</p> <ul style="list-style-type: none"> <li>a) Gas storage</li> <li>b) Oil and gas pipelines</li> <li>c) LNG facilities</li> <li>d) Gas reception facilities</li> </ul> |
| <p><b>Electricity Networks NPS</b></p> <p>Introduction<br/>Locational considerations and assessment of impacts</p>                                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                      |                                                                                                                                                                                           |                                                                                                                                                                                                                                                                                                       |

## 1.3 The revised draft Nuclear National Policy Statement

- 1.3.1 The revised draft Nuclear NPS sets out the Government's policy on the national strategic issues which need to be taken into account when granting consent for the

construction of new nuclear power stations. A significant component of the revised draft Nuclear NPS, which differs in this respect from the other energy NPSs, is the list of sites which have been assessed at a strategic level and which Government considers to be potentially suitable<sup>14</sup> for the deployment of new nuclear power stations by the end of 2025.

- 1.3.2 The final, designated Nuclear NPS will be the principal document to set the framework for the IPC in its consideration of applications for development consent for new nuclear power stations. It will set out Government policy on the need for new nuclear infrastructure, and how the IPC should balance this need against the impacts of new nuclear power stations.
- 1.3.3 The revised draft Nuclear NPS has been developed using a Strategic Siting Assessment (SSA) process<sup>15</sup>. The early stage of the NPS development included preparing exclusionary and discretionary criteria to be used in the SSA process, in consultation with regulators, specialists and the public. The SSA process was subject to a HRA<sup>16</sup> screening and an Appraisal of Sustainability<sup>17</sup> (AoS) as part of the overall development of the revised draft Nuclear NPS and these assessment and appraisal reports were included in the consultation processes (July 2008).
- 1.3.4 Nominations to develop sites were invited from third parties and these nominations were assessed against the SSA criteria. Each nominated site was also subject to an AoS and a HRA. Eleven nominated sites<sup>18</sup> were considered against the exclusionary and discretionary criteria of the SSA process which was also informed by the findings of the AoS and HRA processes. The SSA initially identified ten sites as being potentially suitable for the deployment of new nuclear power stations in England and Wales and these sites were consulted on between November 2009 and February 2010. One nominated site, Dungeness, did not pass the discretionary criteria D6: Internationally designated sites of ecological importance. The full explanation for this is set out in the consultation document which accompanied the draft Nuclear NPS<sup>19</sup> for the consultation between November 2009 and February 2010 and also in the Government response<sup>20</sup> to that consultation (which accompanies the consultation on the revised draft Nuclear NPS). The HRA findings for the nominated site at Dungeness are, therefore, not considered further in this Main HRA report.
- 1.3.5 Following the consultation between November 2009 and February 2010 the Government has revised the draft Nuclear NPS taking into account evidence and representations received. As a result of this process, two nominated sites Braystones and Kirksanton were removed from the list of potentially suitable sites included in the revised draft NPS (Figure 1.2). The reasons for this decision and for the wider revisions made to the revised draft Nuclear NPS are set out in the Government's

<sup>14</sup> As set out in the Planning Act 2008, a NPS may identify one or more locations as suitable (or potentially suitable) or unsuitable for a specified description of development. For the purposes of this document, "deployment of new nuclear power stations" means commencing operation of one or more new nuclear power stations on the site.

<sup>15</sup> [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)

<sup>16</sup> BERR (2008) *Habitats Regulations Assessment Screening Report*

<sup>17</sup> BERR (2008) *Applying the proposed Strategic Siting Assessment Criteria: A study of the potential environmental and sustainability effects*

<sup>18</sup> The eleven nominated sites: Bradwell, Braystones, Dungeness, Hartlepool, Hinkley Point, Heysham, Kirksanton, Oldbury, Sellafield, Sizewell and Wylfa.

<sup>19</sup> DECC (2009) *Consultation on draft National Policy Statements for Energy Infrastructure*

<http://data.energynpsconsultation.decc.gov.uk/documents/condoc.pdf>

<sup>20</sup> [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)

response to the public consultation<sup>21</sup>. The HRA findings for these nominated sites are, therefore, not considered further in this Main HRA Report.

- 1.3.6 The Government has concluded that there are eight sites which have been assessed as meeting the SSA criteria and that are capable of sufficiently early deployment to meet its climate change and energy security goals. This list of potentially suitable sites are part of the Government consultation.

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<sup>21</sup> [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)

Figure 1.2: Potentially Suitable Sites



## 2. The HRA Process and Methods

**This Chapter sets out the requirement for HRA, the HRA process and the methods used for assessment.**

### 2.1 The Habitats Directive and the Habitats Regulations

- 2.1.1 The European Directive (92/43/EEC) on the Conservation of Natural Habitats and Wild Flora and Fauna (the Habitats Directive) protects habitats and species of European nature conservation importance by establishing a network of internationally important sites designated for their ecological status. These are referred to as Natura 2000 sites or European Sites<sup>22</sup>, and comprise Special Protection Areas<sup>23</sup> (SPAs), Special Areas of Conservation (SACs), candidate Special Areas of Conservation (cSAC), and Sites of Community Importance (SCIs) designated and defined under the EC Habitats Directive<sup>24</sup>.
- 2.1.2 Article 6(3) of the Habitats Directive requires '*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 and projects. In England and Wales this requirement is transposed into UK law by the Conservation of Habitats and Species Regulations 2010 (the 'Habitats Regulations')<sup>25</sup>.
- 2.1.3 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.

<sup>22</sup> The term European Site is used in this Main HRA Report and throughout all the Site HRA Reports.

<sup>23</sup> Classified under the EC Birds Directive 1979.

<sup>24</sup> It is Government policy to treat Ramsar sites, designated by the Ramsar Convention on Wetlands (1971) and potential SPAs (pSPAs) as if they are fully designated European Sites for the purpose of considering any development proposals that may affect them. In this report, "European sites" is also used to refer to Ramsar sites. For more information about Ramsar sites, see Planning Policy Statement 9 Biodiversity and Geological Conservation; Government Circular: Biodiversity & Geological Conservation – Statutory Obligations and their impact within the planning system (ODPM, 2005) and Technical Advice Note (TAN) 5 Nature Conservation and Planning (WAG, 2009).

<sup>25</sup> Regulation 106 applies the requirements and controls in relation to plans under the Regulations to National Policy Statements designated under the Planning Act 2008.



Figure 2.1: Habitats Regulations Assessment – Legislative Requirement

**Habitats Directive**

Article 6(3) *'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.'*

**Habitats Regulations**

Regulation 102 (1) *'Where a land use plan (a) is likely to have a significant effect on a European Site or a European offshore marine site (either alone or in combination with other plans or projects), and (b) is not directly connected with or necessary to the management of the site, the plan-making authority for that plan shall, before the plan is given effect, make an appropriate assessment of the implications for the site in view of that site's conservation objectives.'*

Regulation 106 (1) *This part applies (a) in relation to a national policy statement under Part 2 (National Policy Statements) of the Planning Act 2008 (159) as it applies in relation to a land use plan.'*

**2.2 HRA and the revised draft Nuclear NPS**

2.2.1 The Habitats Directive and the Habitats Regulations require that HRA be undertaken on *'plans'* and *'projects'* that are likely to have a significant effect on a protected European Site. The revised draft Nuclear NPS sets a framework for the strategic spatial planning of new development, and through the inclusion of potentially suitable sites for new nuclear power stations, includes a specific spatial expression of the policy statement's intent. It is therefore necessary to undertake a HRA of the revised draft Nuclear NPS that includes strategic consideration of each potentially suitable site.

**2.3 Scope of assessment: the revised draft Nuclear NPS including potentially suitable sites**

2.3.1 The HRA of the revised draft Nuclear NPS, including the potentially suitable sites, has been undertaken at a strategic level. HRA as applied to plans requires a broader level of assessment<sup>26</sup>. In particular, it is acknowledged that at a plan level there may be limitations or uncertainties in predicting effects on European Sites, and in determining how those effects may be avoided or reduced. The requirement, where uncertainty exists, is to ensure that the precautionary approach is applied, and if necessary, that the plan accounts for and directs the continuation of the HRA process for subsequent stages of the plan development, and for planning at project level where consenting decisions are taken.

2.3.2 For the revised draft Nuclear NPS, the strategic level assessment has also been limited by the lack of detailed locational and technological information available on new nuclear power stations at a plan level. Whilst the broad proposals for potentially

<sup>26</sup> See for example, the Advocate General's opinion to the European Court Justice, Case C-6/04 EC v United Kingdom of Great Britain and Northern Ireland and Tyldesley D (2009), *The Habitats Regulations Assessment of Local Development*

suitable sites are known, the exact location, configuration and technical design of any new nuclear power station that might be built on such a site is not. The HRA analysis of the draft Nuclear NPS has therefore focused on:

- Strategic level HRA screening of options for the development of the Nuclear NPS and of the SSA criteria that have informed the decisions on potentially suitable sites;
- Assessing the potential effects on European Sites in relation to the framework it sets (and in particular the list of potentially suitable sites) for the consenting of the development of new nuclear power stations;
- Assessment of in-combination effects, in particular where there are regional clusters of potentially suitable sites; and
- Identifying possible avoidance and mitigation measures to be considered as part of the Nuclear NPS development and to inform the guidance provided by the NPS to the IPC.

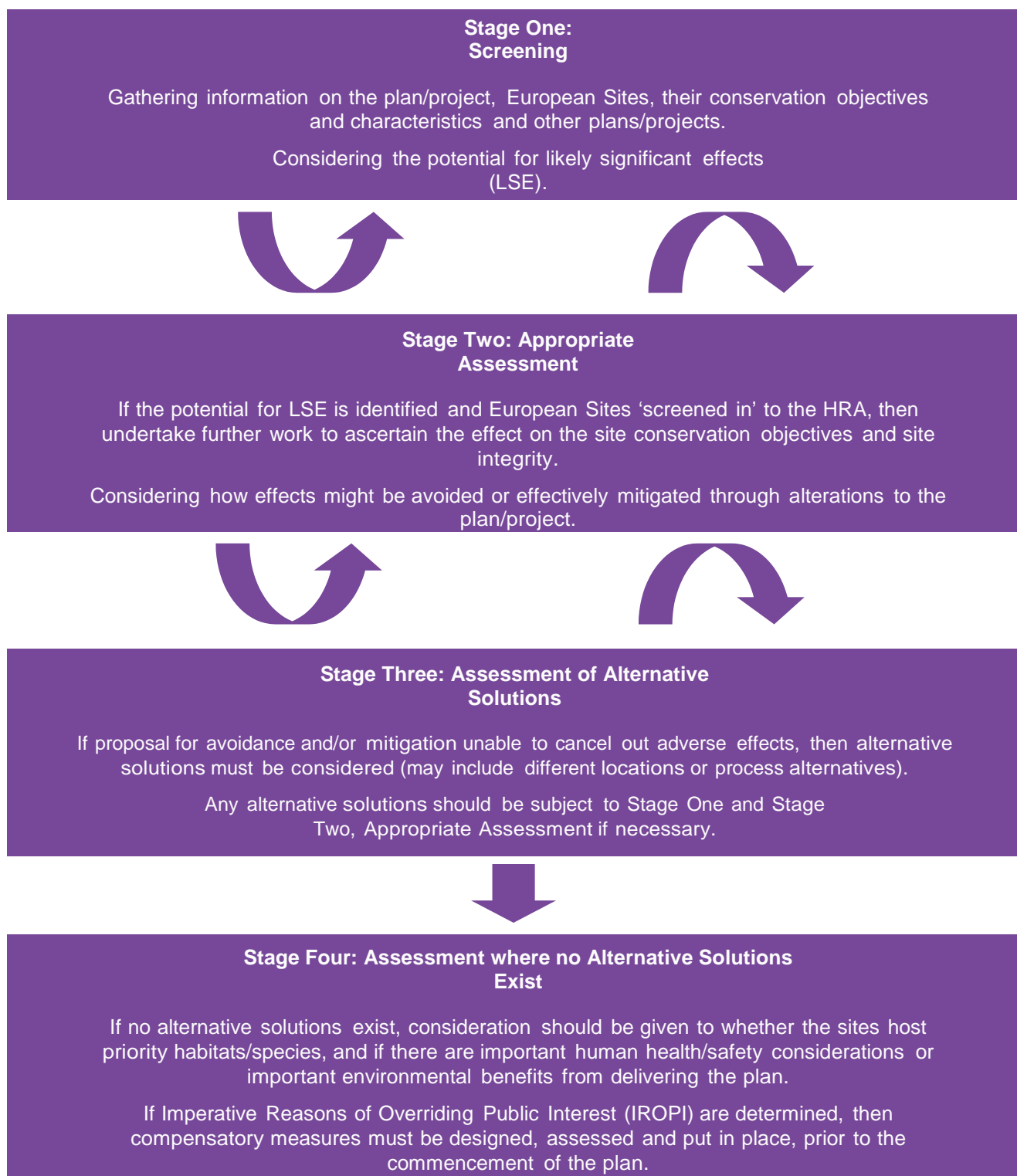
## 2.4 Overview of the HRA process

- 2.4.1 The key stages of HRA, as set out in EU guidance on the assessment of plans and projects significantly affecting European sites, are outlined in Figure 2.2<sup>27</sup>. The process which has been applied to the HRA of the revised draft Nuclear NPS, incorporating the potentially suitable sites, is typically iterative and assessments have been revisited in response to consultation advice and additional information received as the plan has developed.

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<sup>27</sup> Consultation with Department of Communities and Local Government on the HRA method (February 2009) confirmed that while the Government's guidance remains in draft [Planning for the Protection of European Sites: Appropriate Assessment under The Conservation (Natural Habitats &c) (Amendment) (England & Wales) Regulations 2006] the EU guidance should be applied for HRA of plans.

Figure 2.2: Habitats Regulations Assessment: Key Stages<sup>28</sup>



2.4.2 Guidance recommends that the HRA process should be undertaken during the preparation of the plan at its earliest stages, in order that the assessment findings inform and influence the evolution of the plan. In particular, the findings of the Screening and AA stages of the HRA should aim to, *‘remove policies and proposals*

<sup>28</sup> Further information about HRA methodology can be found at [http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura\\_2000\\_assess\\_en.pdf](http://ec.europa.eu/environment/nature/natura2000/management/docs/art6/natura_2000_assess_en.pdf)

*that are potentially harmful and explicitly include measures to ensure that all development flowing from, or controlled by the plan, would not have an adverse effect on the integrity of a European Site*<sup>29</sup>.

- 2.4.3 This approach has been applied to the development of the revised draft Nuclear NPS, with the HRA informing the NPS plan options, the SSA process, and the drafting of the Nuclear NPS, including revisions and its listing of potentially suitable sites.
- 2.4.4 The HRA of the revised draft Nuclear NPS has covered Stages 1 - 4 of the process outlined at Figure 2.2.

## 2.5 Stage 1: Screening

- 2.5.1 Screening is the first stage of a HRA; it considers whether a plan is likely to have a significant effect on any European Site. An effect is considered to be significant when it could potentially undermine the conservation objectives of a European Site, and is considered likely if it cannot be excluded on the basis of objective information that it will occur<sup>30</sup>. Screening involves considering ‘*as far as may be reasonably predicted*’ the likely nature, magnitude, duration, location and spatial extent of changes resulting from implementation of the plan, policies and proposals at a plan level<sup>31</sup>. This is effectively a risk assessment process that seeks to understand whether the plan may adversely affect European Sites (e.g. through a cause-effect pathway). In reaching a decision the screening can take account of avoidance, cancellation and reduction measures that are proposed both as part of the plan, and in response to emerging HRA findings<sup>32</sup>.
- 2.5.2 In support of the NPS development, the proposed options for the revised draft Nuclear NPS were screened to assess the potential for likely significant effects. This involved considering whether there were any clear cause-effect pathways between the proposed options for delivering the revised draft Nuclear NPS and European Sites. The options considered for the revised draft Nuclear NPS were considered in the absence of locational information. Accordingly, the screening was undertaken at a broad, strategic level using a simple matrix to consider whether a determination of likely significant effect was possible, and to inform further screening stages.
- 2.5.3 A HRA Screening of the proposed Strategic Siting Assessment (SSA) criteria was also undertaken in support of the NPS development. Again, in the absence of locational information, this was undertaken at a strategic level and involved considering whether there was potential for likely significant effects on European Sites as a result of decisions made using the SSA criteria. The summary findings of these two screening exercises are presented in Chapter 3 of this report.
- 2.5.4 The HRA Screening of the potentially suitable sites involved the key tasks outlined in Table 2.1. The HRA Screening findings are provided in the individual Site HRA Reports and their accompanying appendices, Annexes A-H of this Main HRA Report.

<sup>29</sup> Tyldesley D (2009), *The Habitats Regulations Assessment of Local Development Documents, Revised Draft Guidance for Natural England*.

<sup>30</sup> European Court of Justice in Case C-127/02 (the Waddenzee Judgment).

<sup>31</sup> Tyldesley D (2009), *The Habitats Regulations Assessment of Local Development Documents, Revised Draft Guidance for Natural England*.

<sup>32</sup> Hart District Council v The Secretary of State for Communities and Local Government, Luckmore Limited and Barratt Homes Limited (2008) EWHC 1204 (Admin).

Table 2.1: HRA Screening Tasks

| Task                                                                  | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|-----------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>European Site Identification and Characterisation<sup>33</sup></b> | <ul style="list-style-type: none"> <li>• Scoping European sites for inclusion in screening based on known sensitivities and the likely spatial extent of impacts arising from the plan.</li> <li>• European Sites within a 20km radius were scoped into the screening process. European Sites at a greater distance, but with hydrological connectivities to European Sites within the 20km radius, were also scoped into the screening in line with statutory consultee advice.</li> <li>• Examining conservation objectives of European sites (where available).</li> <li>• Considering environmental conditions necessary to support site integrity and identifying known vulnerabilities, sensitivities and pressures.</li> </ul> |
| <b>Review of Site Proposal and Identification of Likely Impacts</b>   | <ul style="list-style-type: none"> <li>• Identifying likely impacts arising from the plan/sites and the spatial extent of changes arising from implementation of the plan.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Identification and Consideration of Other Plans and Projects</b>   | <ul style="list-style-type: none"> <li>• Identifying other plans and projects whose effects may combine with those of the plan under consideration, in such a way that the effects become significant.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Screening Assessment</b>                                           | <ul style="list-style-type: none"> <li>• A systematic consideration of the information gathered to determine whether significant effects are likely and if further AA is required.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

2.5.5 Where the screening identified the potential for likely significant effects, from the potentially suitable sites either alone, or in-combination with other plans and projects, then further AA was undertaken. This stage of the HRA is described in more detail below.

## 2.6 Stage 2: Appropriate Assessment

2.6.1 AA is necessary where the plan, or key elements of the plan, cannot be screened out as being unlikely to lead to significant effects on European Sites. The role of the AA is to explore further on the basis of additional information, the potential for significant adverse effects on the conservation objectives and overall integrity of European Sites, and where appropriate, to devise avoidance and mitigation measures to address identified effects. The key tasks undertaken to complete the AA stage for the revised draft Nuclear NPS's potentially suitable sites are outlined in Table 2.2. The HR/AA findings are provided in the individual Site HRA Reports and their accompanying appendices<sup>34</sup> which form Annexes A-H of this Main HRA Report.

<sup>33</sup> Official data sources: Joint Nature Conservation Committee [www.jncc.gov.uk](http://www.jncc.gov.uk);

<sup>34</sup> These documents can be found at [www.energy-nps-consultation.decc.gov.uk](http://www.energy-nps-consultation.decc.gov.uk)

Table 2.2: HRA Appropriate Assessment Tasks

| Task                                                             | Details                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Scoping and Additional Information Gathering</b>              | <ul style="list-style-type: none"> <li>• Taking forward AA methodology as set out in guidance<sup>35</sup>.</li> <li>• Gathering additional information on European Sites and background environmental conditions/trends in line with the issues identified through screening.</li> </ul>                                                                                                                                                                                                                                |
| <b>Assessing Impacts (in-combination) Appropriate Assessment</b> | <ul style="list-style-type: none"> <li>• Assessing on the basis of available information, whether construction, operation and decommissioning of new nuclear power stations on the potentially suitable site will have an adverse effects on the integrity of European Site(s).</li> <li>• Assessing whether effects in-combination with other potentially suitable sites and/or plans and projects out-with the revised draft Nuclear NPS have the potential for adverse effects on European Site integrity.</li> </ul> |
| <b>Developing Avoidance/ Mitigation Proposals</b>                | <ul style="list-style-type: none"> <li>• Considering how identified effects can be avoided or mitigated through: amendments to the proposal; the introduction of/requirement for specific avoidance and mitigations measures; the inclusion of specific policy caveats; the requirement for further HRA at the project level.</li> </ul>                                                                                                                                                                                 |

## 2.7 Stage 3: Assessment of alternative solutions

- 2.7.1 If the HRA identifies that the plan either alone, or in combination with other projects or plans is likely to have an adverse effect on the integrity of a European site, or if the potential for adverse effects on integrity cannot be ruled out<sup>36</sup>, then alternative solutions should be considered (Habitats Directive, Article 6(4)). The assessment of alternative solutions should be in line with Stages 1 and 2 of the HRA process (Figure 2.2).
- 2.7.2 In accordance with the requirements of the Habitats Directive the Government identified and assessed alternative solutions. A summary of Government's conclusions regarding the suitability of the sites considered in relation to the delivery of the plan, and of the findings of the HRAs undertaken, are presented in Chapter 6 of this Report. The findings for individual alternative sites are provided in Site HRA Reports (for Druridge Bay, Kingsnorth and Owston Ferry) and their accompanying appendices<sup>37</sup>.

## 2.8 Stage 4: Assessment where no alternative solutions exist and where adverse impacts remain

- 2.8.1 In the absence of alternative solutions and where adverse effects on European Sites remain or cannot be ruled out, it is necessary to establish Imperative Reasons of Overriding Public Interest (IROPI) for why the plan should proceed (Habitats

<sup>35</sup> Assessment of plans and projects significantly affecting Natura 2000 sites. Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, European Commission

<sup>36</sup> This is the case where no reasonable scientific doubt remains as to the absence of such effects remains - European Court of Justice in Case C-127/02 (the Waddenzee Judgment).

<sup>37</sup> <https://www.energynpsconsultation.decc.gov.uk/nuclear/hra/other/>

Directive, Article 6(4)). Where European Sites host priority habitats and species it is necessary to consider whether or not there are human health or public safety considerations or benefits which are of primary importance to the environment flowing from the plan. IROPI arguments that do not fall within one of these criteria can be invoked after an opinion is sought from the European Commission. Compensatory measures that maintain the coherence of the Natura 2000 network must also be identified and established.

- 2.8.2 Chapter 7 of this Report summarises the Government’s Imperative Reasons of Overriding Public Interest (IROPI) for why the plan should proceed. A framework for compensation measures is also outlined in accordance with the requirements of the Habitats Directive.

## 2.9 Limitations and uncertainties

- 2.9.1 The HRA of the revised draft Nuclear NPS has been undertaken at a strategic level where data sources are limited and where there are inherent uncertainties relating to the footprint and magnitude of development. For example, the specific technologies and detailed design and footprints of the proposed power stations to be developed on sites have yet to be finalised; the boundaries of the potentially suitable sites may be subject to change;; and detailed conservation objectives for European Sites may be unavailable at the time of assessment.
- 2.9.2 Any uncertainties and the limitations of the assessment process are acknowledged and highlighted within the individual HRA/AA reports for the potentially suitable sites as appropriate (Annexes A-H of this Main HRA Report).
- 2.9.3 It is also recognised that for HRA at a plan level it is neither achievable nor feasible to conduct the detailed level of information gathering and assessment that would be associated with project level HRA. Current guidance suggests that what is expected is ‘... *as rigorous an assessment as can reasonably be undertaken...*’ that meets the requirements of the Habitats Directive<sup>38</sup>.
- 2.9.4 Recommendations for avoidance and mitigation measures to address the potential adverse effects on European Site integrity identified by the AA are also based on the information available at the time of the assessment, and are focused on strategic level interventions. The recommendations also take into account consultation advice from the Statutory Consultees and the role of the regulatory bodies, including the Environment Agency through their resource planning and licensing/regulatory processes.

## 2.10 Consultation

- 2.10.1 It is a requirement of the Habitats Directive that in undertaking HRA the plan-making authority (the Secretary of State in this case) consult the ‘*appropriate nature conservation body*’ (the “statutory consultees”) and have regard to any representations made by that body. In the UK the statutory consultees for nature conservation are: Natural England (NE); the Countryside Council for Wales (CCW); Scottish Natural Heritage (SNH), and the Department of the Environment Northern

<sup>38</sup> Tyldesley D (2009), *The Habitats Regulations Assessment of Local Development Documents, Revised Draft Guidance for Natural England*, page. 7.

Ireland (DOENI)<sup>39</sup>. Public consultation is a discretionary requirement and the Regulations note that the plan-making authority can, if it considers it appropriate, also take the opinion of the general public into account.

- 2.10.2 The HRA of the revised draft Nuclear NPS has followed the regulatory requirements for consultation and adopted a good practice approach as set out in guidance. In addition to the formal consultation with statutory consultees on the HRA Reports accompanying the revised draft Nuclear NPS, all the HRA reports have also been published on the DECC website<sup>40</sup> and comments from interested parties will be considered as part of the overall HRA process for the revised draft Nuclear NPS.
- 2.10.3 Consultation is an ongoing process. In addition to the consultation undertaken at defined stages of the plan-making process, further consultation with the statutory consultees has been undertaken as part of the plan development.
- 2.10.4 Table 2.3 lists the key consultation steps undertaken in the production of the HRA for the revised draft Nuclear NPS.

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<sup>39</sup> The Environment Agency, whilst not a Statutory Consultee for the HRA process, has a key role in managing water resources, including ensuring the protection of European Sites through consenting and discharge regulation. The Environment Agency has therefore been included in the overall statutory consultation process.

<sup>40</sup> [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)



Table 2.3: Habitats Regulations Assessment consultation

| Date                       | Stage                                                                                                      | Consultees                                                                                                                               |
|----------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| <b>June 2008</b>           | Draft HRA Screening Report                                                                                 | Consultation with statutory consultees                                                                                                   |
| <b>July 2008</b>           | HRA Screening Report <sup>39</sup>                                                                         | Consultation with statutory consultees. Publication of Screening report on website and comments from interested parties considered       |
| <b>Dec 2008 – Oct 2009</b> | Development of HRA, Methods, Scope of HRA Screening and AA of nominated sites and draft Nuclear NPS        | Consultation with statutory consultees                                                                                                   |
| <b>April – Oct 2009</b>    | Draft HRA Reports for Nominated Sites                                                                      | Consultation with statutory consultees                                                                                                   |
| <b>June 2009</b>           | Draft Main HRA Report for draft Nuclear NPS                                                                | Consultation with statutory consultees                                                                                                   |
| <b>August – Oct 2009</b>   | Draft HRA Reports for sites identified through the Atkins Study                                            | Consultation with statutory consultees                                                                                                   |
| <b>Sept – Oct 2009</b>     | Draft Main HRA Report and Non-Technical Summary including IROPI and Compensation for the draft Nuclear NPS | Consultation with statutory consultees                                                                                                   |
| <b>November 2009</b>       | Main HRA Report and Non-Technical Summary accompanying draft Nuclear NPS                                   | Consultation with statutory consultees. Publication on DECC website <sup>41</sup> . Comments from interested parties considered.         |
| <b>October 2010</b>        | Main HRA Report and Non-Technical Summary accompanying revised draft Nuclear NPS                           | Consultation with statutory consultees. Publication on DECC website <sup>42</sup> . Comments from interested parties will be considered. |

<sup>41</sup> <http://www.berr.gov.uk/files/file47138.pdf>

<sup>42</sup> [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)

## 3. Developing the Habitats Regulations Assessment

This Chapter outlines the development of the HRA prior to this report, including the HRA screening of options for the initial draft Nuclear NPS, and the proposed Strategic Siting Assessment criteria. The relationship of the HRA work with the AoS, including the findings of the AoS on waste as relevant to the HRA process, is also summarised.

### 3.1 Options for developing the revised draft Nuclear NPS

- 3.1.1 The development of the Nuclear NPS has involved the consideration of different alternatives for delivering the key aims of the plan. Four possible alternatives for the revised draft Nuclear NPS have been considered<sup>43</sup>:
- B1: a Nuclear NPS that includes siting criteria only and has no list of sites;
  - B2: a Nuclear NPS that includes a list of sites and no siting criteria;
  - B3: a Nuclear NPS that includes siting criteria and a list of sites; and
  - B4: a Nuclear NPS that includes siting criteria and a list of sites but restricts sites considered to those in the vicinity of existing nuclear power stations.
- 3.1.2 These ‘process’ alternatives have been subject to an Appraisal of Sustainability (AoS) and current guidance suggests that it is good practice for the HRA to consider options for the plan delivery that are also being considered by the wider sustainability appraisal and Strategic Environmental Assessment (SEA) processes<sup>44</sup>. Accordingly these alternatives were subject to a strategic level HRA screening.
- 3.1.3 In accordance with the approach detailed in Chapter 4 of the Main AoS Report a strategic level HRA Screening was undertaken of the four process options presented which represent the main ways in which the Nuclear NPS might be prepared. The screening used a simple matrix and considered at a broad level whether a determination of likely significant effects was possible.
- 3.1.4 In addition to these ‘process’ alternatives, the Government has also considered three further strategic ‘needs’ alternatives. They are:
- a **Nuclear NPS in line with Government policy**;
  - an **NPS that prohibits nuclear**; and
  - **No Nuclear NPS** (business as usual).

<sup>43</sup> The process alternatives B1-B4 are identified and discussed in: Applying the Strategic Siting Assessment Criteria: an update to the study of the potential environmental and sustainability effects. Office for Nuclear Development (January 2009).

<sup>44</sup> Department of Communities and Local Government (DCLG) (2006), *Planning for the Protection of European Sites*; Tyldesley D. (2009), *The Habitats Regulations Assessment of Local Development Documents*.

- 3.1.5 The AoS has appraised in generic terms the effects of these needs alternatives on biodiversity and ecology. However, because these alternatives concern high level policy choices, no clear conclusions can be drawn as to the sites that might be developed under the different needs alternative. For this reason, the needs alternatives have not been screened or appropriately assessed by the HRA, although Chapter 7 sets out and provides an analysis of the possibility of resorting to the “zero” alternative (of not having the Nuclear NPS) in the context of the Government’s explanation of the Imperative Reasons of Overriding Public Interest (IROPI) that require that the plan is designated.

### Screening assumptions

- 3.1.6 The AoS of the process alternatives considered the potential significant environmental and wider sustainability effects of these alternatives to the plan. The AoS outlined key assumptions underpinning the appraisal process, which are also relevant to the HRA Screening; these assumptions are detailed below.
- 3.1.7 Alternatives B3 and B4 represent a Nuclear NPS in which both siting criteria and a list of potentially suitable sites are included; in the case of B4, the list of sites is restricted to those in the vicinity of existing nuclear power stations. It has been assumed that both Alternatives B3 and B4 would lead to the earlier and larger scale deployment of new nuclear power stations than would be the case for B1 and B2. This is because the planning process would be shorter, the sites would already have been subject to strategic scrutiny, and significant information would already be available. The application of siting criteria could also help avoid the selection of those sites which could have adverse effects on European Sites.
- 3.1.8 In the case of B4, this may allow for the protection of European Sites in areas that might otherwise have been considered for new nuclear build. However, given that many existing nuclear power stations and European Sites are located in close proximity to each other, it could result in increased pressures on those designated sites.
- 3.1.9 Alternative B2, in which a list of nominated sites is presented without any siting criteria, is likely to result in later and smaller scale deployment of new nuclear power stations, as planning regulations would require the nominated sites to be subject to a (later) strategic siting assessment (SSA). Further, there would be no way of knowing how sites not included would be assessed by Government. Excluding siting criteria may also allow non-suitable sites to be included. However, in publishing a list of potentially suitable sites, the strategic, cumulative and synergistic effects could be assessed, which could provide long-term benefits.
- 3.1.10 Alternative B1, in which siting criteria are included in the Nuclear NPS, but with no list of nominated sites, would result in later and smaller scale deployment of new nuclear build, as it could take longer to bring a site forward for development; it may also reduce the chances of some sites being brought forward. The inclusion of siting criteria could allow for the identification of non-suitable sites, but in the absence of nominated sites, potential likely significant effects (LSE) could not be assessed. This could lead to the inadequate consideration of alternative sites, with potential adverse effects on European designations. Overall, Alternative B1 could result in a greater level of uncertainty about where sites would be developed and consequently, the level of protection afforded to the European Sites.

3.1.11 Table 3.1 summarises the HRA screening of Alternatives B1 to B4 in the light of the assumptions presented above. None of the alternatives detail site locations, beyond those known in relation to existing power stations, and therefore have no specific spatial expression. Accordingly the assessment is undertaken at the broadest level in considering whether or not there are clear cause-effect pathways between the alternatives presented and likely significant effects on European Sites.

Table 3.1: HRA screening findings: revised draft Nuclear NPS Process Alternatives

| Revised Draft Nuclear NPS: Process Alternatives                                       | HRA Screening Assessment: Potential for Likely Significant Effects                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |
|---------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Alternative B1 (criteria are listed but no sites)</b>                              | <ul style="list-style-type: none"> <li>• The alternative provides no site information which limits the identification of likely significant effects.</li> <li>• The inclusion of siting criteria provides the opportunity to develop a selection process that includes strategic and early consideration of key biodiversity designations including European Sites, and the avoidance of locations where the potential for significant effects is considered more certain or likely.</li> </ul>                                                                                                                                                                         |
| <b>Alternative B2 (sites listed but no criteria)</b>                                  | <ul style="list-style-type: none"> <li>• The alternative provides no site information, but if developed, the provision of a sites list would allow the HRA to consider (at a strategic level) whether significant effects are likely, dependent on the actual locations listed.</li> <li>• Having no siting criteria limits the ability of the plan maker to apply a selection 'sift' that removes sites from the list where significant effects are considered certain or likely.</li> <li>• The potential for likely significant effects on European Sites from this alternative is greater (than for the alternatives where siting criteria are applied).</li> </ul> |
| <b>Alternative B3 (sites and criteria listed)</b>                                     | <ul style="list-style-type: none"> <li>• The alternative provides no site information, but if developed the provision of a sites list would allow HRA to consider (at a strategic level) whether significant effects are likely, dependent on the actual locations listed.</li> <li>• The inclusion of siting criteria provides the opportunity to develop a selection process that includes strategic and early consideration of key biodiversity designations including European Sites. It supports opportunities for the avoidance of locations where the potential for significant effects is considered more certain or likely.</li> </ul>                         |
| <b>Alternative B4 (only existing nuclear power station sites and criteria listed)</b> | <ul style="list-style-type: none"> <li>• The alternative provides no specific site information, beyond that which may be known in relation to existing stations, but if developed, the provision of a sites list would allow HRA to consider at a strategic level whether significant effects are likely, dependent on the actual locations listed.</li> <li>• The inclusion of siting criteria provides the opportunity to develop a selection process that includes strategic and early consideration of key biodiversity designations including</li> </ul>                                                                                                           |

|  |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|  | <p>European Sites. It also allows for the avoidance of locations where the potential for significant effects is considered more certain or likely.</p> <ul style="list-style-type: none"> <li>• This alternative may allow for the protection of European Sites in areas that might otherwise have been considered for new nuclear power stations. However, given that existing operating nuclear power stations are located in coastal areas that are close to European Sites; this alternative could result in increased pressures on those designated sites through the cumulative effects of additional nuclear build.</li> </ul> |
|--|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

- 3.1.12 This strategic level HRA screening indicates that the potential for likely significant effects on European Sites arising from new nuclear power station development, would be best managed if sites were identified in line with the approach set out in the option B3 variant of the revised draft Nuclear NPS. This finding concurs with the findings of the AoS, and taking into account the wider evidence base for the plan, is the approach that the Government has chosen to adopt.

## 3.2 Options for the Strategic Siting Assessment criteria

### HRA Screening Report July 2008

- 3.2.1 HRA should be undertaken during the earliest stages of the preparation of the plan, so that the plan development can take account of, and be influenced by, the HRA findings. Accordingly, HRA Screening was also undertaken on the phase of the draft Nuclear NPS development that involved the production of SSA criteria, designed to inform the selection of sites to be included in the NPS. The findings, which were reported in full in the HRA Screening Report (July 2008)<sup>45</sup> are summarised below.
- 3.2.2 The screening focused on the proposed SSA criteria (nuclear safety, environmental protection, societal issues and operational requirements) and assessed whether the broad locations identified by their implementation would be likely to result in significant effects on European Sites. As part of the analysis the screening also summarised the likely generic impacts and effects arising from the development of new nuclear power stations.
- 3.2.3 The screening assessment concluded that impacts on biodiversity, flora and fauna as a result of the construction, operation and decommissioning of new nuclear power stations could not be ruled out. General construction activities (for example, use of vehicles, earthworks and excavations) could negatively impact on biodiversity. During operation, the accidental release of radioactive materials, non-radioactive discharges and the abstraction of water for cooling purposes could also impact negatively on biodiversity. During decommissioning, unplanned radioactive discharges to the air, water or soil from interim storage or during the transport of radioactive waste for final disposal could negatively impact biodiversity. The likelihood of any such releases, however, would be extremely low, as a result of adherence to strictly enforced regulatory conditions aimed at preventing them from occurring.
- 3.2.4 The screening report noted that the application of the SSA criteria to identify potential sites will not ensure that significant effects are avoided, only that the criteria provide

<sup>45</sup> <http://www.berr.gov.uk/files/file47138.pdf>

some strategic level safeguards, the effectiveness of which would be entirely dependent on their implementation. The screening report concluded that a further HRA (screening exercise) would need to be undertaken once sites had been nominated and, where necessary, AA would also be required.

### Government Response to the July 2008 Consultation (January 2009)

- 3.2.5 The Government Response to the Consultation outlined how comments on the HRA are being addressed and noted that consultation is an ongoing element of the overall HRA process<sup>46</sup>.
- 3.2.6 Following the publication of the HRA Screening Report (July 2008) the Government sought views from the Statutory Consultees (NE, CCW, the DoENI and SNH). Comments were also invited from interested parties and members of the public. All the consultation comments received were reviewed in the context of the screening findings and future work on the HRA. The key stages of consultation undertaken for the HRA of the revised draft Nuclear NPS are outlined in Chapter 1 of this Report.

## 3.3 Habitats Regulations Assessment: relationship with the Appraisal of Sustainability

- 3.3.1 This Habitats Regulations Assessment is being undertaken in parallel with the Appraisal of Sustainability (AoS). The Planning Act 2008<sup>47</sup> requires that an AoS must be carried out before a National Policy Statement can be designated. The main purpose of an AoS is to examine the likely social, economic and environmental effects of implementing the NPS. If potential significant adverse effects are identified, the AoS recommends options for avoiding or mitigating such effects. In this way the AoS helps inform the preparation of the NPS to promote sustainable development.
- 3.3.2 The appraisal of the revised draft Nuclear NPS incorporates an assessment in accordance with the requirements of the European Directive on Strategic Environmental Assessment (SEA) which aims for a high level of environmental protection and to promote sustainable development<sup>48</sup>. It applies to certain plans that are likely to have a significant effect on the environment. The AoS considers socio-economic effects as well as environmental effects.
- 3.3.3 The consideration of sustainability effects in the AoS includes biodiversity, and in common with the HRA, the appraisal provides details of potential effects on designated sites including European Sites. Where data and information are common to the AoS and HRA processes, analysis and findings have been shared to inform the overall assessment of effects as relevant to both processes<sup>49</sup>.

<sup>46</sup> BERR (2009) *Towards a Nuclear Policy Statement: Government response to consultations on the Strategic Siting Assessment process and siting criteria for new nuclear power stations in the UK; and to the study on the potential environmental and sustainability effects of applying the criteria*, <http://www.berr.gov.uk/files/file49865.pdf>

<sup>47</sup> The Planning Act 2008. [http://www.opsi.gov.uk/acts/acts2008/pdf/ukpga\\_20080029\\_en.pdf](http://www.opsi.gov.uk/acts/acts2008/pdf/ukpga_20080029_en.pdf)

<sup>48</sup> European Directive 2001/42/EC (the SEA Directive), on the environmental assessment of plans and programmes.

<sup>49</sup> DCLG (2006) *Planning for the Protection of European Sites: Appropriate Assessment. Guidance for Regional Spatial Strategies and Local Development Documents*.

## 3.4 Radioactive waste, spent fuel and hazardous waste

- 3.4.1 The revised draft Nuclear NPS sets out the Government's view that effective arrangements will exist to manage and dispose of the waste that will be produced from new nuclear power stations.
- 3.4.2 New nuclear power stations will produce a range of different waste streams. Assuming that there will be no reprocessing of spent fuel from new nuclear power stations, the waste streams produced by new nuclear power stations are: non radioactive hazardous wastes; gaseous and liquid radioactive discharges; low level waste (LLW); intermediate level waste (ILW) and spent fuel. The revised draft Nuclear NPS is concerned particularly with "*higher activity wastes*", which are spent fuel and ILW, and states that geological disposal is the way that higher activity wastes will be managed in the long term. This will be preceded by safe and secure interim storage until a geological disposal facility can receive waste.
- 3.4.3 The AoS appraised the sustainability of the arrangements for managing all the waste streams and the findings are presented in the Main AoS Report<sup>50</sup>. The appraisal noted that potential effects of waste management relating to biodiversity at the potentially suitable sites are most likely to arise as a result of construction activities, directly from land take and indirectly from disturbance, air and water quality changes. The appraisal also identified that the exclusion of human activity and development from storage sites can have minor positive impacts for some species and habitats. These impacts should be managed in accordance with Environmental Management Plans (EMPs) informed by the strategic AoS and project level Environmental Impact Assessments (EIAs).
- 3.4.4 The HRA of the revised draft Nuclear NPS has also considered the potential effects of the management and interim storage of radioactive waste, spent fuel and hazardous waste on European Sites as part of the assessment of potentially suitable sites based on the proposed site footprints. The assessment findings concur with the AoS that any potential effects on European Sites of waste management and interim storage will arise through the construction and development stages of new nuclear build. The assessment findings are provided in the individual site HRA Reports and are summarised in Chapter 6 of this Main HRA Report.
- 3.4.5 The AoS distinguished between effects arising at nuclear power stations and in the course of transport of waste from these sites and those effects arising at the locations where waste is disposed of. It noted that new nuclear power stations will require additional capacity to be provided at a geological disposal facility (GDF) for the spent fuel and ILW arising from the new nuclear power stations. The AoS findings in this regard are limited as the design and location of a facility are not currently known. In the absence of specific locations for a GDF the HRA has not considered the potential effects on European Sites of the geological disposal requirements arising from the revised draft Nuclear NPS. A further HRA of a proposed GDF will be required in due course.

<sup>50</sup> See Chapter 6 of the Appraisal of Sustainability of the revised draft Nuclear National Policy Statement: Main Report, and Chapter 7 of the revised draft Nuclear NPS at [www.energy-nps-consultation.decc.gov.uk](http://www.energy-nps-consultation.decc.gov.uk)

# **SECTION B: FINDINGS OF THE HABITATS REGULATIONS ASSESSMENT: THE REVISED DRAFT NUCLEAR NPS WITH POTENTIALLY SUITABLE SITES**



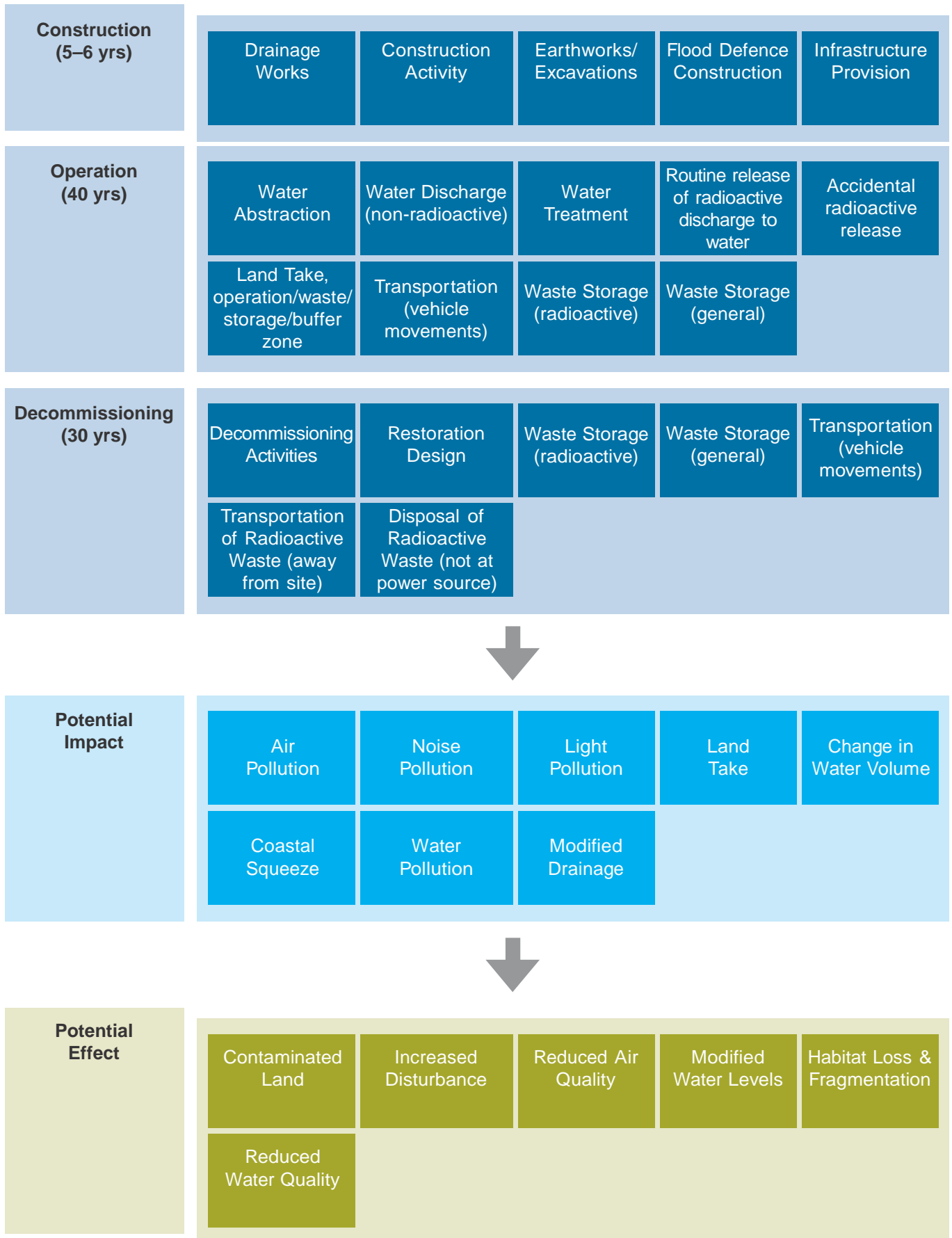
## 4. HRA Screening Findings

This Chapter summarises the findings of the HRA Screening of the draft Nuclear NPS incorporating the potentially suitable sites.

### 4.1 Potential effects on environmental conditions and biodiversity

- 4.1.1 The HRA Screening undertaken on emerging drafts of the Nuclear NPS (July 2008) identified a range of likely generic impacts and effects arising from the development of new nuclear power stations. These are summarised in Figure 4.1.

Figure 4.1: Generic potential impacts and effects of new nuclear power stations on environmental conditions and biodiversity



- 4.1.2 Subsequent HRA screening of the potentially suitable sites has identified that development at the proposed locations may significantly affect European Sites as a result of the particular impacts and effects outlined in Figure 4.2.

Figure 4.2: Identified potential impacts and effects of new nuclear power stations on European Sites

- . Impacts on **Water Resources** (abstraction and discharge) and **Water Quality**
- . **Habitat (and species) loss and fragmentation**
- . **Coastal squeeze**
- . **Disturbance events (noise, vibration, human activity);** and
- . **Air Quality** changes

- 4.1.3 The following sections provide an overview of the nature of the impacts and potential likely significant effects identified in Figure 4.2. The full details of the individual screening assessments are provided in the site HRA Reports (Annexes A-H of the Main HRA Report). Table 4.3 summarises the site HRA Report Screening findings for each European Site in relation to the potentially suitable sites.

## 4.2 Water resources and water quality

- 4.2.1 The screening assessments identified that proposed nuclear power station development may affect water resources and water quality in a number of ways.
- 4.2.2 The conservation objectives for European Sites typically focus on maintaining habitats such as salt marsh, mudflats and sand flats in a favourable condition. A key requirement for the maintenance of these habitats is the appropriate quality, volume, timing and duration of fresh and marine water available to sustain ecosystem functioning. The screening assessments highlighted that discharge of effluent from new nuclear power stations could result in the build up of heavy metals and salts in receiving water bodies, resulting in the death of aquatic biota (e.g. fish or mussels) and the predators that feed on them (e.g. birds). Synthetic and non-synthetic toxic compounds could also build up in plants and animals (e.g. migratory fish species such as sea lamprey, river lamprey and twaite shad) through uptake and ingestion, increasing the vulnerability of species to disease and genetic mutation, and potentially altering reproduction and dispersal rates as a result of endocrine disruption<sup>51</sup>.
- 4.2.3 The screening assessments indicated that toxins can also bind to particulates and sediment, affecting the physical and chemical quality of habitats such as salt marsh and inter-tidal mudflats. If high nutrient loads are discharged, this could favour non-native invasive vegetation species and more generalist species, altering sensitive vegetation communities. High nutrient loading could also result in algal blooms, reducing the availability of oxygen in the water column (from the surface to sediment), thereby impacting on both plant and animal communities. The discharge of cooling water (up to 10°C warmer<sup>52</sup>) from new nuclear power stations can further reduce the amount of soluble oxygen available to flora and fauna, as oxygen is less soluble at higher temperatures. Marked changes in water temperature and oxygen availability can also result in thermal and chemical barriers, affecting European Sites.

<sup>51</sup> Endocrine disruptors are external substances that act like hormones and disrupt the internal hormone system of the affected species.

<sup>52</sup> Environment Agency (2005) *Measuring Environmental Performance, Sector Report for the Nuclear Industry*.

- 4.2.4 The abstraction and/or addition of water during the construction, operation or decommissioning of nuclear power stations could alter the natural functioning of ecosystems at European Sites. Rivers and estuaries are particularly vulnerable to these changes. For example, altering the volume, timing and duration of flows may limit fish migration and spawning. It may also alter the structure of physical habitats and compromise aquatic plant and invertebrate communities. Changes to groundwater levels could also result in their failure to deliver important base flows for rivers necessary to sustain the ecosystem during low flows, or impact water levels in important habitats.
- 4.2.5 The screening assessments highlighted that where European Sites are connected, for example through the hosting and transit of migratory species, (e.g. River Wye SAC and the Severn Estuary SAC), there is the potential to transfer direct and indirect negative impacts (for example, polluted water and sediment) between designated sites.
- 4.2.6 Table 4.3 summarises the findings of screening for likely effects on water resources and quality on each of the European Sites in relation to the potentially suitable sites. The screening assessment has identified that LSE could not be ruled out or that the conclusions are uncertain for a number of European Sites and that the potential for adverse effects on the integrity of these European Sites should be considered in more detail through Appropriate Assessment (AA).

### 4.3 Habitat (and species) loss and fragmentation

- 4.3.1 The screening assessments identified that the development of new nuclear power stations has the potential to result in habitat (and species) loss and fragmentation. This could occur as a result of direct land take (development of the site, construction laydown areas, cooling water infrastructure etc.), ancillary and enabling works developments (for example, site preparation and transport), and from the construction and maintenance of flood defences. Where land take requires construction on the coastal fringe, direct and indirect loss and degradation of estuarial, mud flat, sand flat and salt meadow habitat and associated communities is possible. Potentially suitable sites with estuarine European Sites directly adjacent to the proposed site boundaries include Hartlepool, Heysham, Hinkley Point, Oldbury and Sizewell.
- 4.3.2 The screening assessments indicated that the proposed developments could result in the displacement of migratory bird species from suitable breeding, roosting and foraging grounds to alternative areas. This may have effects on fish species by increasing pressure on adjacent and neighbouring foraging grounds which could impact on prey availability.
- 4.3.3 Indirect effects were shown by the screening assessments to be likely to occur from increased levels of sedimentation and nutrient loading and from the creation of thermal (discharge of cooling water), chemical (discharge of poor water quality) and physical (e.g. flood defence) barriers to migration and dispersal. The loss and fragmentation of habitat is of particular concern where qualifying habitat features such as estuaries, salt meadows and reefs comprise transitional habitats maintained by natural processes upheld by levels of nutrient and sediment input and output. Species loss could also occur to cooling water intake screens and the entrainment of fish larvae and marine organisms during the abstraction process.

- 4.3.4 As with the impacts associated with the discharge and abstraction of water, where European Sites are connected, (e.g. designated sites within the Severn Estuary or designated sites along the Cumbrian Coast), there is the potential to transfer direct and indirect negative impacts between designated sites.
- 4.3.5 Table 4.3 summarises the findings of screening for likely significant effects on habitat (and species) loss and fragmentation on each of the European Sites in relation to the potentially suitable sites. The screening assessment identified that LSE could not be ruled out or that the conclusions are uncertain for a number of European sites and that the potential for adverse effects on the integrity of these European Sites should be considered in more detail through AA.

## 4.4 Coastal squeeze

- 4.4.1 Coastal squeeze impacts are closely related to habitat loss and fragmentation, and relate specifically to situations where the coastal margin is bounded by a fixed landward boundary. Coastal squeeze is typically caused by the development of flood and sea defences and the reinforcement of coastal margins through hard engineering which prevent and alter the natural transport and movement of coastal material. This can result in both direct and indirect effects on species, communities and habitats.
- 4.4.2 The screening assessments highlighted that new nuclear power stations could result in further habitat loss (for example, sub-tidal habitat at Oldbury), and where new flood defences may be needed (for example, Bradwell, Heysham and Sizewell) there is potential for changes to the coastal boundary to alter the hydrodynamics and sediment transport in estuarial and marine waters. Such alterations are likely to impact on aquatic and marine species and habitats assemblages (communities of habitats that are interdependent).
- 4.4.3 Table 4.3 summarises the findings of screening for likely significant effects of coastal squeeze on each of the European Sites in relation to the potentially suitable sites. The screening assessment identified that LSE could not be ruled out or that the conclusions are uncertain for a number of European Sites and that the potential for adverse effects on the integrity of these European Sites should be considered alongside habitat (and species) loss and fragmentation effects, in more detail through AA.

## 4.5 Disturbance events (noise, vibration, human activity)

- 4.5.1 The screening assessments identified that the development of new nuclear power stations has the potential to result in disturbance to habitats and species from noise and vibration. Disturbances are likely to occur during all phases of nuclear power generation (e.g. construction, operation and decommissioning) from a number of sources including construction traffic, intermittent machinery, vehicle and plant sounds and the influx of a large workforce. The most disturbing activities for species are irregular, unpredictable and loud noise events, and vibrations of long duration.
- 4.5.2 The screening assessments noted that these events impact particularly on wintering birds that expend unnecessary energy and have reduced feeding times as a result of reacting to disturbance events which could also result in the abandonment of chicks and eggs. Displacement from chosen roosting and feeding sites can ultimately affect the designation of these sites. Such disturbance events over the longer term can have

direct negative impacts on species survival. These issues are relevant at all potentially suitable sites where there are SPA and Ramsar designations (for example, Severn Estuary SPA, Ramsar, Morecombe Bay SPA, Ramsar, Outer Thames Estuary SPA).

- 4.5.3 Disturbance events can also impact on the behaviour and distribution of migratory fish species and otters. Low frequency noise and regular vibration can impact on the movement and reproductive success of migratory fish species (for example, sea lamprey, Atlantic salmon, sea trout) present at a number of the European Sites screened (e.g. Severn Estuary SAC, River Wye SAC).
- 4.5.4 Table 4.3 summarises the findings of screening for the likely significant effects of disturbance events on each of the European Sites in relation to the potentially suitable sites. The screening assessment has identified that LSE could not be ruled out or the conclusions are uncertain for a number of European sites and that the potential for adverse effects on the integrity of these European Site should be considered in more detail through AA.

## 4.6 Air quality

- 4.6.1 New nuclear power stations produce emissions through the construction, operation and decommissioning phases that could impact on air quality and lead to effects at European Sites. The screening assessments noted that the effects of these emissions will be determined by emission volumes and composition (for example, oxides of nitrogen and sulphate, ammonia, ozone), as well as the nature of the receiving environment. For example the deposition of nitrogen could lead to soil enrichment, while sulphur deposition could lead to increased soil and water acidity, which may alter species compositions. In considering the potential effects of air quality changes the screening assessments did also note that air quality in the UK has improved over the last 15 years and is likely to continue to do so as a result of tightening emissions standards.
- 4.6.2 Although operation of nuclear reactors may result in very small radioactive gaseous discharges (noble gases, Carbon-14, Tritium, Iodines), statutory obligations require that radiation exposures not only comply with dose limits, but are As Low As Reasonably Achievable (ALARA). These aerial discharges are controlled so as not to cause harm to humans or ecosystems.
- 4.6.3 Although the screening assessment generally concluded that no significant local impacts were likely to occur on European Sites as a result of changes to air quality from both non-radioactive and radioactive discharges, the assessments applied the '*precautionary principle*' and recommended that further information should be gathered as part of the AA to address the potential uncertainties identified in relation to air quality for European Sites.
- 4.6.4 Table 4.3 summarises the findings of screening for the likely significant effects of changes to air quality on each of the European Sites in relation to the potentially suitable sites.

## 4.7 Summary of HRA screening

- 4.7.1 The results of the HRA screening of the ten potentially suitable sites are summarised in Table 4.3.

Table 4.3: Summary of Likely Significant Effect Screening Assessment:

| Key                                         |   |                                                                                     |
|---------------------------------------------|---|-------------------------------------------------------------------------------------|
| <b>Likely Significant Effect</b>            | ✓ | further Appropriate Assessment required                                             |
| <b>No Likely Significant Effect</b>         | ✗ | no further Appropriate Assessment required                                          |
| <b>Significant Effect Uncertain</b>         | ? | precautionary approach taken and further Appropriate Assessment required            |
| <b>Likely Significant Effect Scoped Out</b> | 0 | Likely significant effect scoped out at screening due to distance of European sites |

| Potentially Suitable Sites/European Sites:  | Potential Likely Significant Effects |                                              |                 |                                                |             |
|---------------------------------------------|--------------------------------------|----------------------------------------------|-----------------|------------------------------------------------|-------------|
|                                             | Water Resources and Quality          | Habitat (and species) loss and fragmentation | Coastal squeeze | Disturbance (noise, vibration, human activity) | Air quality |
| <b>Hinkley Point</b>                        |                                      |                                              |                 |                                                |             |
| Exmoor and Quantocks Oakwoods SAC           | X                                    | X                                            | X               | X                                              | X           |
| Hestercombe House SAC                       | X                                    | X                                            | X               | X                                              | X           |
| Mendip Limestone Grasslands SAC             | X                                    | X                                            | X               | X                                              | X           |
| River Usk SAC                               | ✓                                    | ✓                                            | X               | ✓                                              | X           |
| River Wye SAC                               | ✓                                    | ✓                                            | X               | ✓                                              | X           |
| Severn Estuary SAC                          | ✓                                    | ✓                                            | ✓               | ✓                                              | ?           |
| Severn Estuary SPA                          | ✓                                    | ✓                                            | ✓               | ✓                                              | ?           |
| Severn Estuary Ramsar                       | ✓                                    | ✓                                            | ✓               | ✓                                              | ?           |
| Somerset Levels and Moors SPA               | ✓                                    | X                                            | X               | X                                              | X           |
| Somerset Levels and Moors Ramsar            | ✓                                    | X                                            | X               | X                                              | X           |
| <b>Oldbury</b>                              |                                      |                                              |                 |                                                |             |
| Avon Gorge Woodlands SAC                    | X                                    | X                                            | X               | X                                              | X           |
| River Wye SAC                               | ✓                                    | ✓                                            | X               | ✓                                              | X           |
| River Usk SAC                               | X                                    | ✓                                            | X               | X                                              | X           |
| Severn Estuary SAC                          | ✓                                    | ✓                                            | ✓               | ✓                                              | ?           |
| Severn Estuary SPA                          | ✓                                    | ✓                                            | ✓               | ✓                                              | ?           |
| Severn Estuary Ramsar                       | ✓                                    | ✓                                            | ✓               | ✓                                              | ?           |
| Wye Valley and Forest of Dean Bat Sites SAC | X                                    | X                                            | X               | X                                              | X           |
| Wye Valley Woodlands SAC                    | X                                    | X                                            | X               | X                                              | X           |
| <b>Heysham</b>                              |                                      |                                              |                 |                                                |             |
| Bowland Fells SPA                           | X                                    | X                                            | X               | X                                              | X           |
| Calf Hill & Cragg Woods SAC                 | ?                                    | X                                            | X               | X                                              | X           |
| Leighton Moss SPA                           | ✓                                    | X                                            | X               | X                                              | X           |
| Leighton Moss Ramsar                        | ✓                                    | X                                            | X               | X                                              | X           |
| Liverpool Bay SPA                           | X                                    | X                                            | X               | X                                              | X           |



| Potentially Suitable Sites/European Sites:              | Potential Likely Significant Effects |                                              |                 |                                                |             |
|---------------------------------------------------------|--------------------------------------|----------------------------------------------|-----------------|------------------------------------------------|-------------|
|                                                         | Water Resources and Quality          | Habitat (and species) loss and fragmentation | Coastal squeeze | Disturbance (noise, vibration, human activity) | Air quality |
| Morecambe Bay Pavements SAC                             | x                                    | x                                            | x               | x                                              | x           |
| Morecambe Bay SAC                                       | ✓                                    | ✓                                            | ✓               | x                                              | ✓           |
| Morecambe Bay SPA                                       | ✓                                    | ✓                                            | ✓               | ✓                                              | ✓           |
| Morecambe Bay Ramsar                                    | ✓                                    | ✓                                            | ✓               | ✓                                              | ✓           |
| Shell Flat and Lune Deep pSPA                           | x                                    | x                                            | x               | x                                              | x           |
| <b>Sellafield</b>                                       |                                      |                                              |                 |                                                |             |
| Borrowdale Woodland SAC                                 | x                                    | x                                            | x               | 0                                              | x           |
| Drigg Coast SAC                                         | ✓                                    | ✓                                            | ✓               | 0                                              | ✓           |
| Lake District High Fells SAC                            | x                                    | x                                            | x               | 0                                              | x           |
| River Ehen SAC                                          | ✓                                    | ✓                                            | x               | 0                                              | x           |
| River Derwent and Bassenthwaite Lake SAC                | ✓                                    | x                                            | x               | 0                                              | x           |
| Wast Water SAC                                          | ✓                                    | x                                            | x               | 0                                              | x           |
| <b>Hartlepool</b>                                       |                                      |                                              |                 |                                                |             |
| Castle Eden Dene SAC                                    | x                                    | x                                            | x               | x                                              | x           |
| Durham Coast SAC                                        | x                                    | x                                            | x               | x                                              | x           |
| North York Moors SAC                                    | x                                    | x                                            | x               | x                                              | x           |
| North York Moors SPA                                    | x                                    | x                                            | x               | x                                              | x           |
| Northumbria Coast SPA                                   | ✓                                    | x                                            | x               | x                                              | x           |
| Northumbria Coast Ramsar                                | ✓                                    | x                                            | x               | x                                              | x           |
| Teessmouth and Cleveland Coast SPA                      | ✓                                    | ✓                                            | ✓               | ✓                                              | ✓           |
| Teessmouth and Cleveland Coast Ramsar                   | ✓                                    | ✓                                            | ✓               | ✓                                              | ✓           |
| <b>Bradwell</b>                                         |                                      |                                              |                 |                                                |             |
| Abberton Reservoir SPA/Ramsar                           | ?                                    | ?                                            | ?               | ?                                              | x           |
| Blackwater Estuary SPA/Ramsar (Mid-Essex Coast Phase 4) | ✓                                    | ✓                                            | ✓               | ✓                                              | ?           |
| Colne Estuary SPA/Ramsar (Mid-Essex Coast Phase 2)      | ?                                    | ?                                            | ?               | ?                                              | x           |

| Potentially Suitable Sites/European Sites:                      | Potential Likely Significant Effects |                                              |                 |                                                |             |
|-----------------------------------------------------------------|--------------------------------------|----------------------------------------------|-----------------|------------------------------------------------|-------------|
|                                                                 | Water Resources and Quality          | Habitat (and species) loss and fragmentation | Coastal squeeze | Disturbance (noise, vibration, human activity) | Air quality |
| Crouch and Roach Estuaries SPA/Ramsar (Mid-Essex Coast Phase 3) | ?                                    | ?                                            | ?               | ?                                              | x           |
| Dengie SPA/Ramsar (Mid-Essex Coast Phase 1)                     | ✓                                    | ✓                                            | ✓               | ✓                                              | ?           |
| Essex Estuaries SAC                                             | ✓                                    | ✓                                            | ✓               | x                                              | ?           |
| Foulness SPA/Ramsar                                             | ?                                    | ?                                            | ?               | ?                                              | x           |
| Mid-Essex Coast SPA/Ramsar complex                              | ?                                    | ?                                            | ?               | ?                                              | x           |
| Outer Thames Estuary SPA                                        | ✓                                    | ?                                            | x               | ?                                              | ?           |
| <b>Sizewell</b>                                                 |                                      |                                              |                 |                                                |             |
| Alde-Ore & Butley Estuaries SAC                                 | ?                                    | ?                                            | 0               | x                                              | x           |
| Alde-Ore Estuary SPA                                            | ?                                    | ?                                            | 0               | x                                              | x           |
| Alde-Ore Estuary Ramsar                                         | ?                                    | ?                                            | 0               | x                                              | x           |
| Benacre to Easton Barents Lagoons SAC                           | x                                    | x                                            | 0               | x                                              | x           |
| Benacre to Easton Barents Lagoons SPA                           | x                                    | x                                            | 0               | x                                              | x           |
| Dew's Ponds SAC                                                 | x                                    | x                                            | 0               | x                                              | x           |
| Minsmere to Walberswick Heaths & Marshes SAC                    | ✓                                    | ✓                                            | 0               | x                                              | ✓           |
| Minsmere to Walberswick SPA                                     | ✓                                    | ✓                                            | 0               | ✓                                              | ✓           |
| Minsmere to Walberswick Ramsar                                  | ✓                                    | ✓                                            | 0               | ✓                                              | ✓           |
| Orfordness-Shingle Street SAC                                   | ?                                    | ?                                            | 0               | x                                              | x           |
| Outer Thames Estuary SPA                                        | ✓                                    | ✓                                            | 0               | ✓                                              | ?           |
| Staverton Park & The Thicks, Wantisden SAC                      | x                                    | x                                            | 0               | x                                              | x           |
| Sandlings SPA                                                   | ✓                                    | ✓                                            | 0               | ✓                                              | ✓           |
| <b>Wylfa</b>                                                    |                                      |                                              |                 |                                                |             |
| Abermenai to Aberffraw Dunes SAC                                | x                                    | x                                            | x               | x                                              | x           |
| Afon Gwyfrai a Llyn Cwellyn SAC                                 | x                                    | x                                            | x               | x                                              | x           |
| Anglesey Coast and Saltmarsh SAC                                | x                                    | x                                            | x               | x                                              | x           |

| Potentially Suitable Sites/European Sites:   | Potential Likely Significant Effects |                                              |                 |                                                |             |
|----------------------------------------------|--------------------------------------|----------------------------------------------|-----------------|------------------------------------------------|-------------|
|                                              | Water Resources and Quality          | Habitat (and species) loss and fragmentation | Coastal squeeze | Disturbance (noise, vibration, human activity) | Air quality |
| Anglesey Fens SAC                            | ?                                    | X                                            | X               | X                                              | X           |
| Anglesey and Llyn Fens Ramsar                | ?                                    | X                                            | X               | X                                              | X           |
| Cemlyn Bay SAC                               | ✓                                    | ✓                                            | ✓               | X                                              | ✓           |
| Glantraeth SAC                               | X                                    | X                                            | X               | X                                              | X           |
| Great Orme's Head SAC                        | X                                    | X                                            | X               | X                                              | X           |
| Holy Island Coast SAC                        | ?                                    | X                                            | X               | X                                              | X           |
| Holy Island Coast SPA                        | X                                    | X                                            | X               | X                                              | X           |
| Lavan Sands, Conway Bay SPA                  | ?                                    | ?                                            | ?               | ?                                              | X           |
| Liverpool Bay pSPA                           | ?                                    | ?                                            | ?               | ?                                              | X           |
| Llyn Dinam SAC                               | ?                                    | X                                            | X               | X                                              | X           |
| Menai Strait and Conwy Bay SAC               | ?                                    | ?                                            | ?               | X                                              | X           |
| Puffin Island SPA                            | ?                                    | ?                                            | ?               | ?                                              | X           |
| Snowdonia SAC                                | X                                    | X                                            | X               | X                                              | X           |
| Ynys Feurig, Cemlyn Bay and The Skerries SPA | ✓                                    | ✓                                            | ✓               | ✓                                              | ✓           |

# 5. Appropriate Assessment Findings

This Chapter sets out a summary of the AA findings of the HRA undertaken on the revised draft Nuclear NPS with potentially suitable sites.

## 5.1 Undertaking Appropriate Assessment

5.1.1 The AA considered in more detail whether the effects identified through the screening process are likely to have an adverse effect on European Site integrity taking into account the potential for further in-combination effects that may arise from other plans or projects that have spatial connections. Where the AA indicated the potential for adverse effects on the integrity of European sites, avoidance and mitigation measures were suggested (Section 5.8 of this Report). The following sections summarise the AA findings and are structured according to:

- Effect themes: water discharge, abstraction and quality; habitat (and species) loss and fragmentation/coastal squeeze; disturbance events (noise, vibration, human activity); and air quality; and
- Each potentially suitable site.

## 5.2 Water resources and quality

5.2.1 In line with the screening findings, the assessments considered the range of potential discharges to water that may have effects on quality and therefore the integrity of European Sites. It was noted that for all potentially suitable sites, radioactive discharges to water are strictly controlled in accordance with limits laid down in permits under the Environmental Permitting (England and Wales) Regulations 2010 and that the Environment Agency has a key role in regulating standards.

5.2.2 The assessments considered that for all potentially suitable sites, the discharge of nutrients (mainly nitrates) from new nuclear power stations could be of concern<sup>53</sup> as this can have measurable localised impacts on nutrient levels in the vicinity of the discharges. Nutrient loading was also identified as an issue during construction, where the discharge of synthetic and non-synthetic toxic compounds together with increased sediment loading through runoff is likely to impact on sensitive habitats and migratory fish (for example, sea lamprey, shad, atlantic salmon, bullhead) relevant to European Sites such as the Northumbrian Coast SPA/Ramsar (Hartlepool) and the Severn Estuary SAC (Hinkley Point, Oldbury). Increased nutrient loading also adversely impacts breeding, over wintering and migratory bird species through the contamination of the food chain and degradation of invertebrate and fish populations. There is a possibility that these effects could be exacerbated where potentially suitable sites are geographically close to each other.

5.2.3 The assessments identified that at the majority of potentially suitable sites, water abstraction for cooling purposes will either be sourced from the sea or from estuaries. It was, therefore, assessed as unlikely that freshwater flows and groundwater levels

<sup>53</sup> Environment Agency (2005) *Measuring Environmental Performance, Sector Report for the Nuclear Industry*.

will be significantly affected by new nuclear power stations. However, it was noted that near some potentially suitable sites there is abstraction from lake sources (e.g. Wast Water SAC near Sellafield). Additionally, at plan level it is unclear how the likely short term effects of increased water demand, particularly during the construction phase, will be met for the new nuclear power stations, as this will depend on the timing of the development of the potentially suitable sites in relation to other activities (e.g. the operation and/or decommissioning of existing nuclear power stations).

- 5.2.4 Given the limited information available to this plan level HRA regarding the water discharge and abstraction requirements of new nuclear power stations, adverse effects on integrity cannot be ruled out at the European Sites listed in Table 5.1. The potential for avoidance and mitigation measures to address the adverse effects identified is considered further in Section 5.8 of this report.

**Table 5.1: Water resources and quality: European Sites at which adverse effects on site integrity cannot be ruled out at plan level**

| <b>Water resources and quality</b> |                                                                                                                                                                                                                                                                  |
|------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Potentially Suitable Site</b>   | <b>European Sites at which adverse effects on site integrity cannot be ruled out at plan level</b>                                                                                                                                                               |
| <b>South West Region</b>           |                                                                                                                                                                                                                                                                  |
| <b>Hinkley Point</b>               | <ul style="list-style-type: none"> <li>• Severn Estuary SAC/SPA/Ramsar</li> <li>• River Wye SAC</li> <li>• River Usk SAC</li> </ul>                                                                                                                              |
| <b>Oldbury</b>                     | <ul style="list-style-type: none"> <li>• River Wye SAC</li> <li>• Severn Estuary SAC/SPA/Ramsar</li> </ul>                                                                                                                                                       |
| <b>North West Region</b>           |                                                                                                                                                                                                                                                                  |
| <b>Heysham</b>                     | <ul style="list-style-type: none"> <li>• Leighton Moss SPA/Ramsar</li> <li>• Morecambe Bay SAC/SPA/Ramsar</li> </ul>                                                                                                                                             |
| <b>Sellafield</b>                  | <ul style="list-style-type: none"> <li>• Drigg Coast SAC</li> <li>• River Ehen SAC</li> <li>• Wast Water SAC</li> <li>• River Derwent and Bassenthwaite SAC</li> </ul>                                                                                           |
| <b>North East Region</b>           |                                                                                                                                                                                                                                                                  |
| <b>Hartlepool</b>                  | <ul style="list-style-type: none"> <li>• Northumbria Coast SPA/Ramsar</li> <li>• Teesmouth and Cleveland Coast SPA/Ramsar</li> </ul>                                                                                                                             |
| <b>East of England Region</b>      |                                                                                                                                                                                                                                                                  |
| <b>Bradwell</b>                    | <ul style="list-style-type: none"> <li>• Abberton Reservoir SPA/Ramsar</li> <li>• Blackwater Estuary SPA/Ramsar</li> <li>• Dengie SPA/Ramsar</li> <li>• Essex Estuaries SAC</li> <li>• Mid-Essex Coast SPA/Ramsar</li> <li>• Outer Thames Estuary SPA</li> </ul> |

|                 |                                                                                                                                                                                                                                                                                                                                            |
|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sizewell</b> | <ul style="list-style-type: none"> <li>• Alde-Ore and Butley Estuaries SAC</li> <li>• Alde-Ore Estuary SPA/Ramsar</li> <li>• Minsmere to Walberswick SPA/Ramsar</li> <li>• Minsmere to Walberswick Heaths and Marshes SAC</li> <li>• Orfordness-Shingle Street SAC</li> <li>• Outer Thames Estuary SPA</li> <li>• Sandlings SPA</li> </ul> |
| <b>Wales</b>    |                                                                                                                                                                                                                                                                                                                                            |
| <b>Wylfa</b>    | <ul style="list-style-type: none"> <li>• Cemlyn Bay SAC</li> <li>• Menai Strait and Conwy Bay SAC</li> <li>• Ynys Feurig, Cemlyn Bay and the Skerries SPA</li> <li>• Liverpool Bay pSPA</li> <li>• Lavan Sands SPA</li> <li>• Puffin Island SPA</li> </ul>                                                                                 |

### 5.3 Habitat (and species) loss and fragmentation/coastal squeeze

- 5.3.1 All the potentially suitable sites are coastal or estuarine locations. The assessments confirmed initial screening findings that the direct loss of qualifying habitats as a result of the development (including ancillary and induced developments) of new nuclear power stations could occur through direct land take and coastal squeeze, for example through the construction of sea defences. This could impact on the coastal transfer of sediment affecting the integrity of qualifying aquatic communities and habitats. This loss and fragmentation of buffering habitats has a cascading effect down the food chain on associated species and communities, and could impact wading birds, migratory wildfowl and fish at European Sites, for example, Minsmere to Walberswick Heaths and Marshes SAC and Orfordness-Shingle Street SAC (Sizewell).
- 5.3.2 The assessments noted that these local effects may be direct and indirect. For example, where there are effects on the migratory atlantic salmon, the fresh water pearl mussel would also be affected as it spends its larval stage attached to the gills of salmonid fishes and is therefore dependent on the maintenance of the salmon population during a key stage in the species life cycle. Examples of European Sites where these effects are relevant include the River Wye SAC and the Severn Estuary SAC (Oldbury, Hinkley Point).
- 5.3.3 The construction of marine off-loading facilities is a potential development for most of the potentially suitable sites assessed, and the associated dredging could lead to the direct loss of benthic<sup>54</sup> and inter-tidal habitat and fauna. This could result in an increase in nutrient loading and remobilise sediment, impacting the overall nutrient and sediment budgets on which designated habitats depend. This is particularly relevant where European designations lie in close proximity or adjacent to potentially suitable sites (for example, Bradwell, Oldbury, Hinkley Point, Heysham, Sizewell).
- 5.3.4 Indirect loss and degradation of habitats and species as a result of the construction, operation and decommissioning of new nuclear power stations could, in some, instances, impact on European Sites (e.g. Outer Thames Estuary SPA). For example,

<sup>54</sup> "Benthic" refers to the organisms that live at the bottom of a body of water

increased turbidity as a result of construction activities could reduce available photosynthetic light in the water column (from the surface to the sediment), which, together with increased sedimentation, could impact on the development and maintenance of plant communities associated with intertidal habitats.

- 5.3.5 Further, reduced levels of oxygen availability and temperature changes as a result of cooling water discharge could affect spawning cycles of migratory fish species (the upstream migration of shad to spawning sites may be triggered earlier in the season by increased water temperatures). There is evidence to suggest that the discharge of cooling waters at some existing power stations is already impacting on fish communities. For example, evidence from the existing Hinkley Point 'B' Power Station indicates that a greater number of warmer water species are being captured on Intake Screens, suggesting that the discharge of warmer waters from new nuclear power stations could detrimentally alter species composition at European Sites. Further developments in the estuary (Hinkley Point, Oldbury) may therefore have adverse effects on the Severn Estuary SAC and River Wye SAC designations.
- 5.3.6 Given that adverse effects on site integrity are likely to arise from habitat (and species) loss and fragmentation and from coastal squeeze as a result of the construction, operation and decommissioning of new nuclear power stations, adverse effects on site integrity cannot be ruled out on the European Sites listed in Table 5.2. The potential for avoidance and mitigation measures to address the adverse effects identified is considered further in Section 5.8 of this report.

Table 5.2: Habitat (and species) loss and fragmentation/coastal squeeze: European Sites at which adverse effects on site integrity cannot be ruled out at plan level

| <b>Habitat (and Species) loss and fragmentation/coastal squeeze</b> |                                                                                                                                                                                                                                                                                                                                               |
|---------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Potentially Suitable Site</b>                                    | <b>European Sites at which adverse effects on site integrity cannot be ruled out at plan level</b>                                                                                                                                                                                                                                            |
| <b>South West Region</b>                                            |                                                                                                                                                                                                                                                                                                                                               |
| <b>Hinkley Point</b>                                                | <ul style="list-style-type: none"> <li>• Severn Estuary SAC/SPA/Ramsar</li> <li>• River Wye SAC</li> <li>• River Usk SAC</li> </ul>                                                                                                                                                                                                           |
| <b>Oldbury</b>                                                      | <ul style="list-style-type: none"> <li>• Severn Estuary SAC/SPA/Ramsar</li> <li>• River Wye SAC</li> <li>• River Usk SAC</li> </ul>                                                                                                                                                                                                           |
| <b>North West Region</b>                                            |                                                                                                                                                                                                                                                                                                                                               |
| <b>Heysham</b>                                                      | <ul style="list-style-type: none"> <li>• Morecambe Bay SAC/SPA/Ramsar</li> </ul>                                                                                                                                                                                                                                                              |
| <b>Sellafield</b>                                                   | <ul style="list-style-type: none"> <li>• Drigg Coast SAC</li> <li>• River Ehen SAC (Habitat Loss only)</li> </ul>                                                                                                                                                                                                                             |
| <b>North East Region</b>                                            |                                                                                                                                                                                                                                                                                                                                               |
| <b>Hartlepool</b>                                                   | <ul style="list-style-type: none"> <li>• Teesmouth and Cleveland Coast SPA/Ramsar</li> </ul>                                                                                                                                                                                                                                                  |
| <b>East of England Region</b>                                       |                                                                                                                                                                                                                                                                                                                                               |
| <b>Bradwell</b>                                                     | <ul style="list-style-type: none"> <li>• Abberton Reservoir SPA/Ramsar</li> <li>• Blackwater Estuary SPA/Ramsar</li> <li>• Colne Estuary SPA/Ramsar</li> <li>• Dengie SPA/Ramsar</li> <li>• Essex Estuaries SAC</li> <li>• Mid-Essex Coast SPA/Ramsar</li> <li>• Outer Thames Estuary SPA</li> </ul>                                          |
| <b>Sizewell</b>                                                     | <ul style="list-style-type: none"> <li>• Minsmere to Walberswick SPA/Ramsar</li> <li>• Minsmere to Walberswick Heaths and Marshes SAC</li> <li>• Sandlings SPA</li> <li>• Orfordness-Shingle Street SAC</li> <li>• Outer Thames Estuary SPA</li> <li>• Alde-Ore &amp; Butley Estuaries SAC</li> <li>• Alde-Ore Estuary SPA /Ramsar</li> </ul> |
| <b>Wales</b>                                                        |                                                                                                                                                                                                                                                                                                                                               |
| <b>Wylfa</b>                                                        | <ul style="list-style-type: none"> <li>• Cemlyn Bay SAC</li> <li>• Menai Strait and Conwy Bay SAC</li> <li>• Ynys Feurig, Cemlyn Bay and the Skerries SPA</li> <li>• Lavan Sands SPA</li> <li>• Puffin Island SPA</li> </ul>                                                                                                                  |



## 5.4 Disturbance (noise, vibration, human activity)

- 5.4.1 The assessments highlighted the findings of existing studies that encroaching human activities can have adverse impacts on the feeding success, reproduction, survival and abundance of designated species<sup>55</sup>.
- 5.4.2 A number of the European Sites considered in the HRA support wading and wildfowl birds that are particularly vulnerable to disturbance. For example, the Outer Thames Estuary SPA, the Mid Essex Coast SPA/Ramsar complex and Abberton Reservoir SPA/Ramsar, which are adjacent to the potentially suitable site at Bradwell, support an extremely high number of internationally important bird assemblages. Disturbance events at all potentially suitable sites where European Sites are adjacent (for example, Oldbury, Hinkley Point, Sizewell) could have more far reaching effects due to the movement of bird species between designations.
- 5.4.3 The assessments noted that noise and vibration could also affect the behaviour of migratory fish populations. Where European Sites are connected (e.g. Severn Estuary SAC and River Wye SAC), adverse effects upon the migratory and reproductive behaviour of fish species arising from the source of disturbance may be transferred to another site, with further impacts on otters within the designated sites. Disturbance events could undermine the environmental conditions necessary to maintain habitats in a favourable condition, as required by the conservation objectives for European Sites.
- 5.4.4 The assessment findings indicate that adverse effects on site integrity are likely to arise from disturbance (especially noise and vibration) as a result of development at the potentially suitable sites, with construction and decommissioning phases likely to be most significant. Adverse effects on site integrity cannot be ruled out for the European Sites listed in Table 5.3. The potential for avoidance and mitigation measures to address the adverse effects identified is considered further in Section 5.8 of this report.

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<sup>55</sup> <http://www.snh.org.uk/pdfs/strategy/renewables/BIRDSD.pdf>.

Table 5.3: Disturbance (noise, vibration, human activity): European Sites at which adverse effects on site integrity cannot be ruled out at plan level

| <b>Disturbance (noise, vibration, human activity)</b> |                                                                                                                                                                                                                                    |
|-------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Potentially Suitable Site</b>                      | <b>European Sites at which adverse effects on site integrity cannot be ruled out at plan level</b>                                                                                                                                 |
| <b>South West Region</b>                              |                                                                                                                                                                                                                                    |
| <b>Hinkley Point</b>                                  | <ul style="list-style-type: none"> <li>• Severn Estuary SAC/SPA/Ramsar</li> <li>• River Wye SAC</li> <li>• River Usk SAC</li> </ul>                                                                                                |
| <b>Oldbury</b>                                        | <ul style="list-style-type: none"> <li>• Severn Estuary SAC /SPA/Ramsar</li> <li>• River Wye SAC</li> </ul>                                                                                                                        |
| <b>North West Region</b>                              |                                                                                                                                                                                                                                    |
| <b>Heysham</b>                                        | <ul style="list-style-type: none"> <li>• Morecambe Bay SPA/Ramsar</li> </ul>                                                                                                                                                       |
| <b>Sellafield</b>                                     | <ul style="list-style-type: none"> <li>• Not Applicable</li> </ul>                                                                                                                                                                 |
| <b>North East Region</b>                              |                                                                                                                                                                                                                                    |
| <b>Hartlepool</b>                                     | <ul style="list-style-type: none"> <li>• Teesmouth and Cleveland Coast SPA/Ramsar</li> </ul>                                                                                                                                       |
| <b>East of England Region</b>                         |                                                                                                                                                                                                                                    |
| <b>Bradwell</b>                                       | <ul style="list-style-type: none"> <li>• Abberton Reservoir SPA/Ramsar</li> <li>• Blackwater Estuary SPA/Ramsar</li> <li>• Dengie SPA/Ramsar</li> <li>• Mid-Essex Coast SPA/ Ramsar</li> <li>• Outer Thames Estuary SPA</li> </ul> |
| <b>Sizewell</b>                                       | <ul style="list-style-type: none"> <li>• Minsmere to Walberswick SPA/Ramsar</li> <li>• Outer Thames Estuary SPA</li> <li>• Sandlings SPA</li> </ul>                                                                                |
| <b>Wales</b>                                          |                                                                                                                                                                                                                                    |
| <b>Wylfa</b>                                          | <ul style="list-style-type: none"> <li>• Ynys Feurig, Cemlyn Bay and the Skerries SPA</li> </ul>                                                                                                                                   |

## 5.5 Air quality

- 5.5.1 The AA stage confirmed the screening findings that for most European Sites no significant local impacts were likely to occur as a result of changes to air quality from both non-radioactive and radioactive discharges. As noted in the earlier stages of the assessment, the Environment Agency in its regulatory role considers that radioactive and non-radioactive aerial emissions from nuclear power stations are low compared to other regulated industries, and all fall within authorised limits<sup>56</sup>.
- 5.5.2 Where air quality issues do arise<sup>57</sup>, they are likely to be as a result of non-radioactive emissions that occur during construction and operation, affecting diffuse air quality conditions in areas where this is specific vulnerability for European Site condition (e.g. Drigg Coast SAC, Sellafield), or where current deposition levels are close to (or within) exceedance level ranges (e.g. Sandlings SAC, Sizewell).
- 5.5.3 The assessments indicated that the qualifying features for a number of European Sites are potentially vulnerable to changes in air quality that may occur as a result of new nuclear power station development and therefore adverse effects on site integrity cannot be ruled out at the European Sites listed in Table 5.4. The potential for avoidance and mitigation measures to address the adverse effects identified is considered further in Section 5.8 of this report.

Table 5.4: Air Quality: European Sites at which adverse effects on site integrity cannot be ruled out at plan level

| Air quality                   |                                                                                                                                                                           |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Potentially Suitable Site     | European Sites at which adverse effects on site integrity cannot be ruled out at plan level                                                                               |
| <b>North West Region</b>      |                                                                                                                                                                           |
| Heysham                       | <ul style="list-style-type: none"> <li>• Morecambe Bay SAC/SPA/Ramsar</li> </ul>                                                                                          |
| Sellafield                    | <ul style="list-style-type: none"> <li>• Drigg Coast SAC</li> </ul>                                                                                                       |
| <b>North East Region</b>      |                                                                                                                                                                           |
| Hartlepool                    | <ul style="list-style-type: none"> <li>• Teesmouth and Cleveland Coast SPA/Ramsar</li> </ul>                                                                              |
| <b>East of England Region</b> |                                                                                                                                                                           |
| Bradwell                      | <ul style="list-style-type: none"> <li>• Blackwater Estuary SPA/Ramsar</li> <li>• Dengie SPA/Ramsar</li> <li>• Essex Estuaries SAC</li> </ul>                             |
| Sizewell                      | <ul style="list-style-type: none"> <li>• Minsmere to Walberswick SPA/Ramsar</li> <li>• Minsmere to Walberswick Heaths and Marshes SAC</li> <li>• Sandlings SPA</li> </ul> |
| <b>Wales</b>                  |                                                                                                                                                                           |
| Wylfa                         | <ul style="list-style-type: none"> <li>• Cemlyn Bay SAC</li> <li>• Ynys Feurig, Cemlyn Bay and the Skerries SPA</li> </ul>                                                |

<sup>56</sup> Environment Agency (2005) *Measuring Environmental Performance: Sector Report for the Nuclear Industry*.

<sup>57</sup> European Sites which contain habitats such as salt marsh, littoral and open water are highly sensitive to nitrogen loads.

## 5.6 Potentially suitable sites summary

5.6.1 The following sections summarise the key issues identified by the AA in relation to each potentially suitable site. The detailed assessments for each site are presented in the individual site HRA Reports in Annexes A-H of this Main HRA Report.

5.6.2 **Bradwell:** The site is located in the East of England on the northern coast of the Dengie Peninsula. Key issues identified by the AA for further consideration in project level HRA are:

- Water abstraction and discharge will be directly from European Sites (Essex Estuaries SAC and the Blackwater Estuary and Dengie SPA/Ramsar) and may affect site(s) integrity through thermal changes;
- Proposed site boundaries suggest some direct and indirect habitat loss from adjacent designations as a result of coastal defence construction and dredging;
- The Mid Essex Coast SPA/Ramsar complex and Abberton Reservoir support an extremely high number of internationally important bird assemblages. The Blackwater Estuary and Dengie components are immediately adjacent to Bradwell and are particularly vulnerable to disturbance effects;
- Potential in-combination effects from decommissioning existing power stations, planned housing/infrastructure, recreation, renewables development; and
- Bradwell is in a cluster of two potentially suitable sites in the region (with Sizewell) with the potential for in-combination effects.

Table 5.5: Bradwell: Appropriate Assessment Summary

| Potential Effects Arising from Development                           | European Sites at which adverse effects cannot be ruled out                                                                                                                                                                                                                                        |
|----------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                                   | <ul style="list-style-type: none"> <li>• Mid-Essex Coast SPA/Ramsar as a whole</li> <li>• Dengie SPA/Ramsar</li> <li>• Blackwater Estuary SPA/Ramsar</li> <li>• Abberton Reservoir SPA/Ramsar</li> <li>• Essex Estuaries SAC</li> <li>• Outer Thames Estuary SPA</li> </ul>                        |
| <b>Habitat (and species) loss and fragmentation/ coastal squeeze</b> | <ul style="list-style-type: none"> <li>• Mid-Essex Coast SPA/Ramsar as whole</li> <li>• Dengie SPA/Ramsar</li> <li>• Blackwater Estuary SPA/Ramsar</li> <li>• Colne Estuary SPA/Ramsar</li> <li>• Abberton Reservoir</li> <li>• Essex Estuaries SAC</li> <li>• Outer Thames Estuary SPA</li> </ul> |

|                                           |                                                                                                                                                                                                                                                                             |
|-------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Disturbance (noise, light, visual)</b> | <ul style="list-style-type: none"> <li>• Mid-Essex Coast SPA/Ramsar as a whole</li> <li>• Dengie SPA/Ramsar</li> <li>• Blackwater Estuary SPA/Ramsar</li> <li>• Abberton Reservoir SPA/Ramsar</li> <li>• Essex Estuaries SAC</li> <li>• Outer Thames Estuary SPA</li> </ul> |
| <b>Air quality</b>                        | <ul style="list-style-type: none"> <li>• Essex Estuaries SAC</li> <li>• Dengie SPA/Ramsar</li> <li>• Blackwater Estuary SPA/Ramsar</li> </ul>                                                                                                                               |

5.6.3 **Hartlepool:** The site is located in the North East of England in an established industrial area. Key issues identified by the AA for further consideration in project level HRA are:

- Proposed site boundaries include direct habitat loss and fragmentation (Teesmouth and Cleveland Coast SPA/Ramsar) from cooling water infrastructure that may contribute to coastal squeeze;
- Adverse effects from disturbance events on the qualifying features of the Teesmouth and Cleveland Coast SPA/Ramsar where there are known vulnerabilities for waterbirds as well as potential effects on migratory fish;
- Teesmouth and Cleveland Coast SPA/Ramsar, although not considered vulnerable to air quality changes, is at critical load for nitrogen deposition, therefore in- combination effects are possible; and
- Potential in-combination effects from decommissioning existing power stations, planned growth (housing/infrastructure), regeneration including ports development and renewable (wind farm) projects.

Table 5.7: Hartlepool: Appropriate Assessment Summary

| Potential Effects Arising from Development                          | European sites at which adverse effects cannot be ruled out                                                                                                                                                |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                                  | <ul style="list-style-type: none"> <li>• Northumbria Coast SPA</li> <li>• Northumbria Coast Ramsar</li> <li>• Teesmouth and Cleveland Coast SPA</li> <li>• Teesmouth and Cleveland Coast Ramsar</li> </ul> |
| <b>Air quality</b>                                                  | <ul style="list-style-type: none"> <li>• Teesmouth and Cleveland Coast SPA</li> <li>• Teesmouth and Cleveland Coast Ramsar</li> </ul>                                                                      |
| <b>Habitat (and species) loss and fragmentation/coastal squeeze</b> | <ul style="list-style-type: none"> <li>• Teesmouth and Cleveland Coast SPA</li> <li>• Teesmouth and Cleveland Coast Ramsar</li> </ul>                                                                      |
| <b>Disturbance (noise, light, visual)</b>                           | <ul style="list-style-type: none"> <li>• Teesmouth and Cleveland Coast SPA</li> <li>• Teesmouth and Cleveland Coast Ramsar</li> </ul>                                                                      |

- 5.6.4 **Heysham:** The site is located in the North West of England on the Lancashire coast, to the south of Morecambe Bay. Key issues identified by the AA for further consideration in project level HRA are:
- Water abstraction and discharge will be directly from a European Site (Morecambe Bay SAC) which is under pressure from poor chemical quality;
  - Proposed site boundaries partly within and adjacent to the Morecambe Bay SAC/SPA/Ramsar, adverse effects from habitat loss and on qualifying features sensitive to disturbance events (for example, Little Terns);
  - Nitrogen deposition at critical loads for Morecambe Bay habitat types, therefore in-combination effects are possible;
  - Potential in-combination effects from decommissioning existing power stations, planned growth (housing/infrastructure), coastal defence plans and projects, renewables projects (tidal and wind power), gas storage facility, and recreation/tourism; and
  - Heysham is in cluster of two potentially suitable sites in the Cumbria area (with Sellafield). This strategic level HRA has not identified in-combination effects in relation to the European Sites considered in the assessment. However, the potential for in-combination effects should be reviewed at project stage.

Table 5.8: Heysham: Appropriate Assessment Summary

| Potential Effects Arising from Development                          | European sites at which adverse effects cannot be ruled out                                                                                                                                     |
|---------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                                  | <ul style="list-style-type: none"> <li>• Leighton Moss SPA</li> <li>• Leighton Moss Ramsar</li> <li>• Morecambe Bay SAC</li> <li>• Morecambe Bay SPA</li> <li>• Morecambe Bay Ramsar</li> </ul> |
| <b>Habitat (and species) loss and fragmentation/coastal squeeze</b> | <ul style="list-style-type: none"> <li>• Morecambe Bay SAC</li> <li>• Morecambe Bay SPA</li> <li>• Morecambe Bay Ramsar</li> </ul>                                                              |
| <b>Disturbance (noise, light, visual)</b>                           | <ul style="list-style-type: none"> <li>• Morecambe Bay SPA</li> <li>• Morecambe Bay Ramsar</li> </ul>                                                                                           |
| <b>Air Quality</b>                                                  | <ul style="list-style-type: none"> <li>• Morecambe Bay SAC</li> <li>• Morecambe Bay SPA</li> <li>• Morecambe Bay Ramsar</li> </ul>                                                              |

- 5.6.5 **Hinkley Point:** The site is located in the South West of England on the Severn Estuary, Somerset Coast. Key issues identified by the AA for further consideration in project level HRA are:
- Water abstraction and discharge will be directly from a European Site (Severn Estuary SAC/SPA, Ramsar) and may affect site integrity;
  - Habitat loss and fragmentation through the construction of cooling water infrastructure and coastal defences (if required) may have adverse effects on adjacent European sites (Severn Estuary SAC/SPA, Ramsar);
  - Wading birds and wildfowl present at adjacent European Sites (Severn Estuary SPA, Ramsar) are particularly vulnerable to disturbance events as are migratory fish moving through the Estuary to rivers (River Usk SAC, River Wye SAC) and the sea;
  - Potential in-combination effects from decommissioning existing power stations, the Severn Tidal Power project, Bristol Deep Sea Container Terminal, planned growth (housing/infrastructure); and
  - Hinkley Point is in a cluster of two potentially suitable sites in the Severn Estuary (Oldbury) with the potential for in-combination effects.

Table 5.9: Hinkley Point: Appropriate Assessment Summary

| Potential Effects Arising from Development          | European sites at which adverse effects cannot be ruled out                                                                                                                             |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                  | <ul style="list-style-type: none"> <li>• Severn Estuary SAC</li> <li>• Severn Estuary SPA</li> <li>• Severn Estuary Ramsar</li> <li>• River Wye SAC</li> <li>• River Usk SAC</li> </ul> |
| <b>Habitat (and species) loss and fragmentation</b> | <ul style="list-style-type: none"> <li>• Severn Estuary SAC</li> <li>• Severn Estuary SPA</li> <li>• Severn Estuary Ramsar</li> <li>• River Wye SAC</li> <li>• River Usk SAC</li> </ul> |
| <b>Coastal Squeeze</b>                              | <ul style="list-style-type: none"> <li>• Severn Estuary SAC</li> <li>• Severn Estuary SPA</li> <li>• Severn Estuary Ramsar</li> </ul>                                                   |
| <b>Disturbance (noise, light, visual)</b>           | <ul style="list-style-type: none"> <li>• Severn Estuary SAC</li> <li>• Severn Estuary SPA</li> <li>• Severn Estuary Ramsar</li> <li>• River Wye SAC</li> <li>• River Usk SAC</li> </ul> |

- 5.6.6 **Oldbury:** The site is located on the south bank of the River Severn in South Gloucestershire in South West England. Key issues identified by the AA for further consideration in project level HRA are:
- Water abstraction and discharge will be directly from a European Site (Severn Estuary SAC/SPA, Ramsar) and may affect site integrity;
  - Adverse effects possible (Severn Estuary SAC/SPA, Ramsar) where habitat loss and fragmentation occurs as a result of the construction of cooling infrastructure (cooling towers) and marine off-loading facilities if required;
  - Potential in-combination effects from decommissioning existing power stations, the Severn Tidal Power project, Bristol Deep Sea Container Terminal, planned growth (housing/infrastructure), and shoreline management plans;
  - Wading birds, waterfowl and migratory fish identified as vulnerable to disturbance arising from proposed developments; and
  - Oldbury is in a cluster of two potentially suitable sites in the Severn Estuary (Hinkley Point) with the potential for in-combination effects.

Table 5.11: Oldbury: Appropriate Assessment Summary

| Potential Effects Arising from Development                          | European Sites at which potential adverse effects cannot be ruled out                                                                                          |
|---------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                                  | <ul style="list-style-type: none"> <li>• Severn Estuary SAC</li> <li>• Severn Estuary SPA</li> <li>• Severn Estuary Ramsar</li> <li>• River Wye SAC</li> </ul> |
| <b>Habitat (and species) loss and fragmentation/coastal squeeze</b> | <ul style="list-style-type: none"> <li>• Severn Estuary SAC</li> <li>• Severn Estuary SPA</li> <li>• Severn Estuary Ramsar</li> <li>• River Wye SAC</li> </ul> |
| <b>Disturbance (noise/vibration, light, visual)</b>                 | <ul style="list-style-type: none"> <li>• Severn Estuary SAC</li> <li>• Severn Estuary SPA</li> <li>• Severn Estuary Ramsar</li> <li>• River Wye SAC</li> </ul> |



- 5.6.7 **Sellafield:** The site is situated on the Cumbrian coast to the west of Gosforth and to the north of Seascale in the North West of England. Key issues identified by the AA for further consideration in project level HRA are:
- Water abstraction and discharge requirements may have adverse effects on four European Sites, in particular as a result of short term requirements for increased water demand (construction development phase);
  - Habitat loss or fragmentation including impacts on migratory fish and changes to sediment patterns may have adverse effects on European Sites in close proximity (Drigg Coast SAC, River Ehen SAC);
  - Potential in-combination effects from planned growth e.g. housing/infrastructure, Barrow Port Action Plan, water based recreation projects regeneration projects, and renewables projects such as offshore wind farms; and
  - Sellafield is in a cluster of two potentially suitable sites in the Cumbria area (with Heysham). This strategic level HRA has not identified in-combination effects in relation to the European Sites considered in the assessment. However, the potential for in-combination effects should be reviewed at project stage.

Table 5.12: Sellafield: Appropriate Assessment Summary

| Potential Impacts Arising from Development          | European sites at which likely adverse effects cannot be ruled out                                                                                                          |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                  | <ul style="list-style-type: none"> <li>• Drigg Coast SAC</li> <li>• River Ehen SAC</li> <li>• Wast Water SAC</li> <li>• River Derwent and Bassenthwaite Lake SAC</li> </ul> |
| <b>Habitat (and species) loss and fragmentation</b> | <ul style="list-style-type: none"> <li>• Drigg Coast SAC</li> <li>• River Ehen SAC</li> </ul>                                                                               |
| <b>Coastal squeeze</b>                              | <ul style="list-style-type: none"> <li>• Drigg Coast SAC</li> </ul>                                                                                                         |
| <b>Air quality</b>                                  | <ul style="list-style-type: none"> <li>• Drigg Coast SAC</li> </ul>                                                                                                         |

- 5.6.8 **Sizewell:** The site is situated on the Suffolk coast, north east of Ipswich and to the south of Lowestoft in the East of England. Key issues identified by the AA for further consideration in project level HRA are:
- Water abstraction and discharge requirements may have adverse effects on European Sites (for example, Alde-Ore Estuary SPA, Ramsar) from transported contaminants and thermal effects;
  - Habitat loss and fragmentation as a result of coastal defence work and a marine landing facility may result in adverse effects on European Sites (for example, changes to the shingle banks through altered sediment transport patterns associated with Orfordness – Shingle Street SAC);
  - Minsmere to Walberswick SPA/Ramsar lies adjacent to the potentially suitable site and qualifying features (Woodlark, Nightjar and Little Tern) are vulnerable to disturbance effects;
  - Potential for in-combination effects from decommissioning existing power station, planned growth (housing/infrastructure), coastal flood defence plans and projects, and recreation strategies; and
  - Sizewell is in a cluster of two potentially suitable sites in the region (Bradwell) with the potential for in-combination effects.

Table 5.13: Sizewell: Appropriate Assessment Summary

| Potential Effects Arising from Development | European sites at which adverse effects cannot be ruled out                                                                                                                                                                                                                                                                                                                                               |
|--------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>         | <ul style="list-style-type: none"> <li>• Alde-Ore and Butley Estuaries SAC</li> <li>• Alde-Ore Estuary SPA</li> <li>• Alde-Ore Estuary Ramsar</li> <li>• Minsmere to Walberswick Heaths and Marshes SAC</li> <li>• Minsmere to Walberswick SPA</li> <li>• Minsmere to Walberswick Ramsar</li> <li>• Orfordness-Shingle Street SAC</li> <li>• Outer Thames Estuary SPA</li> <li>• Sandlings SPA</li> </ul> |
| <b>Air quality</b>                         | <ul style="list-style-type: none"> <li>• Minsmere to Walberswick Heaths and Marshes SAC</li> <li>• Minsmere to Walberswick SPA</li> <li>• Minsmere to Walberswick Ramsar</li> <li>• Sandlings SPA</li> </ul>                                                                                                                                                                                              |

|                                                            |                                                                                                                                                                                                                                                                                                                                                                                                           |
|------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p><b>Habitat (and species) loss and fragmentation</b></p> | <ul style="list-style-type: none"> <li>• Alde-Ore and Butley Estuaries SAC</li> <li>• Alde-Ore Estuary SPA</li> <li>• Alde-Ore Estuary Ramsar</li> <li>• Minsmere to Walberswick Heaths and Marshes SAC</li> <li>• Minsmere to Walberswick SPA</li> <li>• Minsmere to Walberswick Ramsar</li> <li>• Orfordness-Shingle Street SAC</li> <li>• Outer Thames Estuary SPA</li> <li>• Sandlings SPA</li> </ul> |
| <p><b>Disturbance (noise, light, visual)</b></p>           | <ul style="list-style-type: none"> <li>• Minsmere to Walberswick SPA</li> <li>• Minsmere to Walberswick Ramsar</li> <li>• Outer Thames Estuary SPA</li> <li>• Sandlings SPA</li> </ul>                                                                                                                                                                                                                    |

- 5.6.9 **Wylfa:** The site is located at Wylfa Head which extends into the Irish sea from the north coast of Anglesey; an island off North Wales. Key issues identified by the AA for further consideration in project level HRA are:
- Water abstraction and discharge requirements are set against generally good environmental conditions at European Sites close to the potentially suitable site. Identified adverse effects considered most likely to arise ‘in-combination’;
  - Possible habitat loss and fragmentation adverse effects identified for European Sites as a result of site construction activities and cooling infrastructure (e.g. from changing sedimentation flows);
  - Potential in-combination effects from decommissioning of existing power station, planned growth e.g. housing/infrastructure, renewables developments, and recreation strategies.

Table 5.14: Wylfa: Appropriate Assessment Summary

| Potential Effects Arising from Development                          | European sites at which adverse effects cannot be ruled out                                                                                                                                                                                                |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                                  | <ul style="list-style-type: none"> <li>• Cemlyn Bay SAC</li> <li>• Ynys Feurig, Cemlyn Bay and The Skerries SPA</li> <li>• Menai Strait and Conwy Bay SAC</li> <li>• Liverpool Bay pSPA</li> <li>• Lavan Sands SPA</li> <li>• Puffin Island SPA</li> </ul> |
| <b>Habitat (and Species) loss and fragmentation/coastal squeeze</b> | <ul style="list-style-type: none"> <li>• Cemlyn Bay SAC</li> <li>• Ynys Feurig, Cemlyn Bay and The Skerries SPA</li> <li>• Menai Strait and Conwy Bay SAC</li> <li>• Lavan Sands SPA</li> </ul>                                                            |
| <b>Disturbance (noise, light, visual)</b>                           | <ul style="list-style-type: none"> <li>• Ynys Feurig, Cemlyn Bay and The Skerries SPA</li> </ul>                                                                                                                                                           |
| <b>Air quality</b>                                                  | <ul style="list-style-type: none"> <li>• Cemlyn Bay SAC</li> <li>• Ynys Feurig, Cemlyn Bay and The Skerries SPA</li> </ul>                                                                                                                                 |

## 5.7 Revised draft Nuclear NPS in-combination effects

### Potentially suitable site clusters

5.7.1 In line with the requirements of the Habitats Directive, each individual site HRA Report has considered and identified the potential for in-combination effects on the European Sites assessed that may arise from other plans and projects in implementation. The summary of HRA findings in Section 5.6 also highlighted that in-combination effects may occur where more than one potentially suitable site is located within a region or area with significant spatial connections. The potential for in-combination effects where sites occur in clusters is particularly significant for the revised draft Nuclear NPS and the guidance it provides to the IPC. These effects are therefore set out in more detail in the following section.

### Oldbury and Hinkley Point

5.7.2 The construction, operation and decommissioning of nuclear power stations at Oldbury and Hinkley Point has the potential to impact on the conservation objectives of the Severn Estuary SAC/SPA, Ramsar and the River Wye and River Usk SAC sites. There is a small likelihood that the discharge of effluent into the Severn Estuary from both Oldbury and Hinkley Point (if development were to proceed) could increase sediment and nutrient loads in the estuary, thereby impacting on sensitive habitats, migratory fish species and otters. Potential synergistic effects on breeding, over-wintering and migratory bird species are possible. Strict regulatory conditions would, however, significantly reduce the likelihood of this occurring. Potentially more significant are the effects arising from water abstraction and discharge for the purposes of cooling into the Estuary ecosystem.

5.7.3 The in-combination effects of: the direct loss of estuarial, mud flat, sand flat and salt meadow habitats; coastal squeeze; and the fragmentation of habitats as a result of the development at the potentially suitable sites (including ancillary and induced developments); could have cascading effects down the food chain. However, as the development proposals at Oldbury and Hinkley Point are not clearly defined, it is not possible to determine how the nature or timing of both potential developments could affect interest feature birds or indeed conclude that there would not be adverse effects on the integrity of the Severn Estuary SAC, SPA and Ramsar sites and the River Wye and River Usk SACs as a result of disturbance effects.

5.7.4 The possible in-combination air quality effects of developments at the Oldbury and Hinkley Point potentially suitable sites are not assessed as significant.

5.7.5 Given the potential for in-combination effects on the Severn Estuary SAC/SPA, and Ramsar sites and the River Wye and River Usk SACs, the draft Nuclear NPS should guide the IPC to pay particular attention to the HRA findings, including avoidance and mitigation measures provided for Oldbury and Hinkley Point.

### Bradwell and Sizewell

5.7.6 The construction, operation and decommissioning of nuclear power stations at Bradwell and Sizewell has potential for in-combination effects on the conservation objectives of the Outer Thames Estuary SPA. The boundary of the SPA, as set out in the November 2009 consultation, lies directly adjacent to the proposed sites at Bradwell and Sizewell. The SPA, which is entirely marine, is designated for its

population of red-throated divers. The AAs for Bradwell and Sizewell identified that this bird species has a particular sensitivity to toxic contamination from non-synthetic compounds and a moderate sensitivity to synthetic compounds. The assessments noted the potential for direct effects from contaminants (e.g. on the waterproofing of feathers) and a range of indirect effects, in particular as result of pollutants deteriorating prey fish and invertebrate species. The combined effects of discharges from the two proposed power stations and other operators, particularly in the more sheltered coastal and transitional waters of the Estuary, may result in cumulative adverse effects that will require mitigation.

- 5.7.7 The red-throated diver relies on sub-tidal sandbank habitats for feeding and the maintenance of this habitat in favourable condition forms a conservation objective for the SPA. Sandbanks are dynamic systems and changes or disturbance to the hydrological regime may be detrimental to this habitat. The development proposals for Bradwell and Sizewell are not clearly defined and there is potential, depending on the nature and phasing of development, for in-combination adverse effects on these supporting habitats.
- 5.7.8 Sensitivity to noise and visual disturbance from human activity is a specific vulnerability for the designated species of the pSPA which are known to occur in large numbers along the coastline. The potential for development activities to result in disturbance, particularly in the construction phases of both power stations, cannot be ruled out and in-combination effects are likely where activities generating disturbance coincide. The phasing and timing of any development will be required to take into account breeding and feeding cycles as part of any mitigation package. The possible in-combination effects for coastal squeeze and air quality of developments at Bradwell and Sizewell are not assessed as significant.
- 5.7.9 Given the potential for in-combination effects on the Outer Thames Estuary SPA, the revised draft Nuclear NPS should guide the IPC to pay particular attention to the HRA findings, including avoidance and mitigation measures provided for Bradwell and Sizewell.
- 5.7.10 Table 5.15 summarises the European Sites that may be affected by potentially suitable site clusters.

**Table 5.15: European Sites that may be affected by potentially suitable site clusters**

| European Site at which adverse effects cannot be ruled out at plan level | Potentially suitable sites | Effect themes                                                                                                                                                                                                                     |
|--------------------------------------------------------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>River Wye SAC</b>                                                     | Hinkley Point              | <ul style="list-style-type: none"> <li>• water discharge and abstraction</li> <li>• habitat (&amp; species) loss and fragmentation</li> <li>• coastal squeeze</li> <li>• disturbance (noise vibration, human activity)</li> </ul> |
| <b>Severn Estuary SAC/SPA/ Ramsar</b>                                    | Oldbury                    |                                                                                                                                                                                                                                   |

|                                 |          |                                                                                                                                                                                                        |
|---------------------------------|----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Outer Thames Estuary SPA</b> | Bradwell | <ul style="list-style-type: none"> <li>- water discharge and abstraction</li> <li>. habitat (&amp; species) loss and fragmentation</li> <li>. disturbance (noise vibration, human activity)</li> </ul> |
|                                 | Sizewell |                                                                                                                                                                                                        |

### Revised Draft Nuclear NPS, strategic In-combination effects

- 5.7.11 The Habitats Directive requires that HRA includes consideration of possible in-combination effects with other plans and projects. Sections 5.6 and 5.7 of this Report have considered a range of potential in-combination effects that may result from other plans and projects, as well as effects that may occur as a result of individual proposals within the revised draft Nuclear NPS itself. The assessments have noted that proposed measures to avoid or mitigate effects should take into account the possibility of in-combination effects where they have been identified.
- 5.7.12 The Nuclear NPS will have effect in England and Wales and is one of five technology specific energy National Policy Statements along with Fossil Fuels, Renewables, Electricity Networks and Oil and Gas, supported by an Overarching Energy NPS that sets out Government's energy policy and the need for energy infrastructure.
- 5.7.13 In addition to the suite of Energy NPSs, the Government is also producing NPSs for: Ports, National Networks (strategic roads and railways), Airports, Waste Water (sewage treatment), Water Supply (e.g reservoirs) and Hazardous Waste. Collectively these documents set the policy framework for decisions made by the Infrastructure Planning Commission (IPC) on nationally significant infrastructure developments. The NPSs will apply in the context of a spatial planning environment that includes existing strategic, national level plans and projects, for example: strategic planning<sup>58</sup> in England and Wales; the Wales Spatial Plan; national tourism strategies; and national strategies and projects for flood/coastal risk management including Shoreline Management Plans.
- 5.7.14 Where strategic plans or projects are implemented in spatially related areas to the revised draft Nuclear NPS (for example, adjacent to or within the influence of potentially suitable sites) and in similar timescales, there is the potential for in-combination effects to occur at the European Sites considered in this HRA.
- 5.7.15 Given the strategic nature of this assessment and the uncertainties surrounding the timing and effects of other national level plans and projects, it is not practicable to identify all the possible plans and projects that may act '*in-combination*' or to consider the specific nature of likely effects arising. However, it is possible to outline at a strategic level the broad types of effects that may arise from the implementation of other plans and projects which should inform the overall implementation of the revised draft Nuclear NPS. Some of the effects (identified in Table 5.16) may occur as a result of the Nuclear NPS alone, but may also occur or be magnified as a result of a wider range of development actions and activities arising from the implementation of other plans and projects.

<sup>58</sup> This refers to any planning initiatives where local authorities are working in collaboration with other local authorities to deliver at a geographical scale above the local authority tier.

Table 5.16: Potential strategic in-combination effects

| Effects                                             | Development actions and activities                                                                                                                                                                                                                                                                   |
|-----------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                  | <ul style="list-style-type: none"> <li>abstraction to secure water supplies for planned growth (e.g. housing)</li> <li>sewage and industrial effluent discharges from new developments</li> <li>flood and coastal risk management development (e.g. implementation of new flood defences)</li> </ul> |
| <b>Air quality</b>                                  | <ul style="list-style-type: none"> <li>increase in atmospheric pollutants (e.g. road, rail, airports expansion)</li> <li>conventional power stations, fossil fuel emissions</li> <li>hazardous waste management activities</li> </ul>                                                                |
| <b>Disturbance</b>                                  | <ul style="list-style-type: none"> <li>recreational pressures including trampling from settlements expansion, improved access (e.g. national coastal footpaths)</li> <li>infrastructure at height (cooling towers, wind turbines)</li> </ul>                                                         |
| <b>Habitat (and species) loss and fragmentation</b> | <ul style="list-style-type: none"> <li>direct land take (e.g. road, rail, settlements, flood and coastal defences)</li> <li>barriers to migration (e.g. tidal power, bridge construction)</li> </ul>                                                                                                 |

5.7.16 In line with the recommendations detailed in the site level HRA Reports<sup>59</sup>, the IPC in its overview role, should give consideration to the potential for strategic in-combination effects at the development consent stage for each potentially suitable site, including the types of development actions and activities identified above.

## 5.8 Avoidance and mitigation measures

5.8.1 This HRA has being undertaken at a strategic level where there are a number of development uncertainties. These include:

- the location of finalised boundaries of the potentially suitable site(s);
- the location and extent of the marine off-loading site(s) and cooling tower(s) should they be required;
- the type and number of reactors;
- the level(s) of discharges and emissions to be authorised;
- the extent and location of induced and ancillary developments; and
- the location of additional sea and/or flood defences to be constructed should they be required.

<sup>59</sup> These site HRA reports form Annexes A to H to this Main Report. The site reports are available at [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)



- 5.8.2 The following avoidance and mitigation measures are provided as recommendations and have been taken into account in the revised draft Nuclear NPS and the guidance it provides to the IPC. The IPC should ensure that future development takes into account the findings of this strategic level assessment in more detailed project-level HRA(s). Should project-level findings determine that there are effects which cannot be mitigated by the avoidance and mitigation measures recommended here (or by those that emerge as a result of project level investigations), then changes to the development design may be required to ensure adverse effects on the integrity of the European Sites are adequately addressed.
- 5.8.3 Avoidance and mitigation findings are discussed below for the following impacts:
- water resources (discharge, abstraction) and quality;
  - habitat (and species) loss and fragmentation/coastal squeeze;
  - disturbance events (noise, vibration, human activity); and
  - air quality.

### Water resources and quality

- 5.8.4 Avoiding the adverse effects of water discharge and abstraction from new nuclear power stations on European Sites is the responsibility of the developer, and is subject to regulations enforced by the Environment Agency. Further, radioactive discharges are required to be as Low as Reasonably Achievable (ALARA) and all other discharge levels are required to be an improvement on existing standards. All discharges that would lead to adverse impacts on the integrity of European Sites should not be permitted.
- 5.8.5 The use of cooling towers should be considered in preference to direct cooling water intake methods if environmental impacts arising from cooling towers can be more effectively avoided or mitigated. Where direct cooling is required, cooling water culverts should be designed to avoid effects on the existing thermal regime of estuarial and coastal waters, and to minimise the impact on coastal and estuarial sediment transport through appropriate design.
- 5.8.6 Water use efficiency measures should be encouraged in new nuclear power stations to reduce water consumption. On-site water treatment should apply Best Available Technology (BAT) to ensure that effluent discharges do not harm the integrity of European Sites.
- 5.8.7 The use of Sustainable Drainage Systems (SuDs) should be encouraged to minimise the impact of surface runoff and on-site erosion, thereby reducing the impact of sediment loading on European Sites.

### Habitat (and species) loss and fragmentation/coastal squeeze

- 5.8.8 Direct loss of habitat through land take can be mitigated through:
- site layout/design avoiding qualifying habitat;
  - allowing for habitat connectivity via wildlife corridors; and

- the development and implementation of environmental management plans to minimise direct and indirect impacts on habitats and species, and the linking of these plans to existing protection mechanisms and plans.

5.8.9 Coastal squeeze and interruptions to natural geomorphological processes can be mitigated through:

- site layout/design avoiding areas of known importance or sensitivities and protecting existing habitats which are to be retained;
- integrating with Site Management Plans (SMPs) when determining the location and type of coastal defences required; and
- utilising soft engineering techniques such as managed retreat and foreshore recharge as possible flood defence techniques.

5.8.10 Physical, chemical and thermal barriers can be mitigated through:

- works being appropriately screened with height restrictions implemented to limit migratory path disturbance;
- minimising the extent of cooling water culverts and reducing the impact of thermal plumes;
- if cooling towers required, keeping their height as low as practically possible; and
- incorporating fish protection measures within the cooling water intake/system design.

### **Disturbance (noise, vibration, human activity)**

5.8.11 Disturbance caused by new nuclear power stations during construction, operation and decommissioning can be mitigated through:

- the requirement for appropriate technologies to limit impacts on fish and bird populations;
- phased development to take into account breeding and feeding cycles and habitats, and the flight lines and migration routes of sensitive species including birds, fish and otters; and
- developing and applying environmental management plans to limit disturbance impacts on site integrity.

5.8.12 The nature and detail of mitigation measures will need to be agreed with Statutory Bodies prior to commencement of development, and incorporated into the SMP.

### **Air quality**

5.8.13 The impacts of air quality on European Sites can be mitigated through:

- the development and implementation of sustainable transport plans which should include the requirement for the use of non-road transport where possible;

- phased development to minimise emissions and dust generation, and the requirement for carbon-efficient forms of transport;
- a requirement for emissions to be offset<sup>60</sup> where appropriate; and
- development and implementation of appropriate air quality management plans.

5.8.14 Although a regulatory regime is in place to ensure that radioactive emissions from new nuclear build will be low within authorised limits, a number of measures can be applied to ensure further mitigation including:

- application of BAT to ensure protection of the sensitivities of the receiving environment;
- ensure that cumulative effects are considered within management plans, particularly when phasing between existing power station and new build overlaps;
- the requirement for radioactive emissions to be ALARA with non-radioactive emissions expected to be an improvement on existing standards; and
- the requirement that any emissions which lead to adverse effects on European Sites will not be permitted by the relevant regulatory authority.

## 5.9 Recommendations for the revised draft Nuclear NPS

5.9.1 The HRA of the revised draft Nuclear NPS has identified the potential for adverse effects on European Site(s) integrity at each of the ten potentially suitable sites. The findings include consideration of the potential for in-combination effects from other plans and projects and have proposed avoidance and mitigation measures to address the identified effects.

5.9.2 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.

5.9.3 These measures, which are presented as recommendations in this Main HRA Report and the site level HRA Reports (Annexes A-H), have been taken into account in the drafting of the revised draft Nuclear NPS, and the guidance it provides to the IPC.

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<sup>60</sup> Examples of offset approaches include: renewable energy, methane abatement, energy efficiency, reforestation and fuel switching. Offset schemes should be independently certified.

## 6. Assessment of Alternative Solutions

This chapter summarises the assessment of alternative solutions to the potentially suitable sites undertaken in line with the requirements of Article 6(4) of the Habitats Directive. The Government's conclusions as to whether the alternative solutions meet the aims of the revised draft Nuclear NPS, and the findings of the HRA are outlined.

### 6.1 Habitats Directive Requirements

- 6.1.1 The Habitats Directive requires that where the assessment undertaken in accordance with Article 6(3) (Stages 1 and 2 of the HRA process outlined in Chapter 2) produces findings that are negative or uncertain, then the plan maker must consider whether there are alternative solutions for delivering the aims of the plan that better respect the integrity of the European Site(s) in question.
- 6.1.2 European Commission Guidance<sup>61</sup> notes that the identification and assessment of alternatives is set out at Stage 3 of the HRA process (Article 6(4)). However, the Guidance also recognises that, in practice, the consideration of alternatives is an iterative process that is integral to the initial assessment undertaken at Article 6(3) and subsequent assessments under Article 6(4), including the determination of Imperative Reasons of Overriding Public Interest (IROPI) if required.
- 6.1.3 The HRA of the revised draft Nuclear NPS has considered alternatives iteratively in line with European Commission Guidance. Chapter 3 of this Report assessed 'process' alternatives considered in the development of the revised draft Nuclear NPS, and the following Chapter 7 sets out and provides an assessment of the 'zero' alternative (of not having a plan) in the context of the Government's IROPI.
- 6.1.4 This Chapter summarises, in the light of the findings presented in Chapter 5, the assessment of sites which were identified as possible alternatives to the potentially suitable sites.

### 6.2 Identification of Alternatives

- 6.2.1 The Government designed the SSA process to ensure that, as far as possible, sites which might be considered to be potential alternatives to those listed in the revised draft Nuclear NPS, have been identified and assessed at a strategic level. For the reasons given in sections 1.4.4 and 1.4.5 of this document, the three sites that were nominated, but were not considered to be potentially suitable, are not alternative sites in the context of this assessment of feasible alternatives.
- 6.2.2 In addition to the consideration of different locations undertaken by nominators in deciding which sites would be suitable to propose into the SSA, the Government also commissioned Atkins Ltd to produce a study (the "Alternative Sites Study") to identify

<sup>61</sup> European Commission (January 2007) *Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the Concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission.*

whether there were further sites in England and Wales that are potentially suitable for the deployment of new nuclear power stations<sup>62</sup> by 2025.

6.2.3 The study identified three sites as worthy of further consideration:

- Druridge Bay, Northumberland;
- Kingsnorth, Kent; and
- Owston Ferry, Lincolnshire.

### 6.3 Assessment of Alternative Solutions

6.3.1 The Government undertook further assessment of the sites identified by the Alternative Sites Study, including consideration against the SSA criteria. This assessment was informed by an evidence base that included AoS site reports and HRA site reports in line with the approach undertaken for nominated sites.

6.3.2 The initial assessment of these sites concluded that they are not feasible alternatives as they are not capable of meeting the objectives of the plan. Following the public consultation between November 2009 and February 2010, the Government has confirmed that these sites are not feasible alternatives. The full details of the assessment are set out in individual site summaries that accompanied the consultation document for the 2009 consultation<sup>63</sup>, and in the Government response to that consultation<sup>64</sup>. A summary of the conclusions of the site summaries are provided below.

#### Conclusion on the site at Druridge Bay

6.3.3 The assessment concluded that Druridge Bay is not credible for deployment by the end of 2025 and should therefore not be included in the revised draft Nuclear NPS.

6.3.4 This included consideration of the problems inherent with deploying a site which has not previously hosted nuclear facilities, potential difficulties implementing transmission and distribution infrastructure at the site, and the difficulties (and potential delay) that the high amenity value and land ownership of the site would be likely to pose for planning and licensing. The decision that Druridge Bay was not potentially suitable was reached due to all these factors which, whilst some may theoretically be capable of mitigation, when considered in combination considerably impair the potential suitability of the site.

6.3.5 The site was considered against the SSA criteria to ensure that it has been assessed in line with the nominated sites, albeit without the information provided by a nomination or the comments from the public which were provided on nominated sites. Whilst the site may meet the SSA criteria, because it is not credible for deployment by the end of 2025 it was not been included in the draft Nuclear NPS. Consideration of the responses to consultation on the draft NPS has not changed this conclusion. Therefore the site is not listed in the revised draft Nuclear NPS.

<sup>62</sup> Atkins Ltd for DECC (2009) *A consideration of alternative sites to those nominated as part of the Government's Strategic Siting Assessment process for new nuclear power stations* <http://data.energynpsconsultation.decc.gov.uk/documents/atkins.pdf>

<sup>63</sup> <https://www.energynpsconsultation.decc.gov.uk/nuclear/alternatives/>

<sup>64</sup> [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)

### Conclusion on the site at Kingsnorth

- 6.3.6 On the basis of the further assessment undertaken for Kingsnorth the assessment concluded that this site is not credible for deployment by the end of 2025 and should therefore not be included in the initial draft Nuclear NPS. This considered the difficulties of creating extendable emergency plans at the site, and the decommissioning of the existing Kingsnorth power station. The assessment also noted that should other current planning applications be consented and land developed in line with these applications, the future land use of the site identified by the Alternative Sites Study could become potentially very complicated, and create significant problems in relation to the deployment of a nuclear stations on the site. Whilst the assessment considered that the site had the potential to pass the SSA criteria, the potential future land use of the area could impact both on the land available for any new nuclear power station, the proximity to hazardous facilities and increase the impact on sites of international ecological importance, which surround the site identified by the Alternative Sites Study.
- 6.3.7 In addition, there were concerns around potential conflict with development of the Thames Gateway. Consideration of the responses to the public consultation has not changed the conclusion on the site which is not listed in the revised draft Nuclear NPS.

### Conclusion on the site at Owston Ferry

- 6.3.8 The assessment came to the preliminary view that Owston Ferry is not a credible candidate for deployment by the end of 2025 and it was not included in the initial draft Nuclear NPS. The assessment against the SSA criteria showed that the site had the potential to pass the SSA criteria although there would be particular concerns around cooling, the impacts that this might have on a river environment, and whether the effects of climate change might make these issues worse. Notwithstanding the assessment against the criteria, the issues with deployability were such that the site was not potentially suitable.
- 6.3.9 The Alternative Sites Study highlighted that the lack of preparatory work done at the river based site meant that Owston Ferry would take significantly longer to develop than most of the nominated sites. This and other complicating factors suggested that development by the end of 2025 was unlikely to be viable. The Alternative Sites Study noted that, in discussions with energy companies about river-based sites, some ruled out their development completely and even the most positive regarded them as a low priority. Consideration of the responses to public consultation on the initial draft Nuclear NPS has not changed the conclusion on the site which is not listed in the revised draft Nuclear NPS.

## 6.4 Habitats Regulations Assessment Summary

- 6.4.1 The Government's assessment, regarding the suitability of the three sites considered by the Alternative Sites Study as worthy of further consideration, was informed by the HRA undertaken for each site.
- 6.4.2 Although, ultimately, the HRA findings are not relevant to the decision that the three sites are not credible for the deployment of new nuclear power stations by the end of 2025, the following sections summarise the key issues identified by the AA in relation to

each alternative site. The detailed assessments for each site are presented in the individual site HRA Reports<sup>65</sup>.

6.4.3 The HRAs followed the process set out in Chapter 2 of this report. Stage 1: Screening and Stage 2: Appropriate Assessment was undertaken for each site<sup>66</sup>.

6.4.4 **Druridge Bay:** The site is located on the Northumberland coast between the villages of Hadston to the north and Cresswell to the South and Widdrington to the west. Key issues identified by the AA that would require further consideration in project level HRA are:

- Water abstraction and discharge requirements are set against generally good environmental conditions at European Sites that are located in the area around the site. Identified potential adverse effects relate to migratory and transitory qualifying species (fish, birds and seals);
- Possible habitat loss and fragmentation adverse effects identified for European Sites should development occur on the foreshore (for example, from coastal squeeze changing sedimentation flows);
- Adverse effects possible for qualifying species of European Sites assessed (Grey Seals, Little Tern, Purple Sandpiper and Turnstone) which have identified vulnerabilities to disturbance;
- Identified vulnerabilities to air pollution of designated habitats (North Northumberland Dunes SAC) indicate potential for adverse effects;
- Potential in-combination effects from planned growth (housing/infrastructure), ports and marina development, renewables strategies (wind power) and recreation strategies.

<sup>65</sup> The HRA of the three alternative sites was undertaken on the basis of information provided through the Alternative Sites Study.

<sup>66</sup> [www.energynpsconsultation.decc.gov.uk](http://www.energynpsconsultation.decc.gov.uk)

Table 6.1: Druridge Bay: Appropriate Assessment Summary

| Potential Effects Arising from Development          | European sites at which adverse effects cannot be ruled out                                                                                                                                                        |
|-----------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                  | <ul style="list-style-type: none"> <li>• North Northumberland Dunes SAC</li> <li>• Berwickshire and North Northumberland Coast SAC</li> <li>• Northumbria Coast SAC/Ramsar</li> <li>• Coquet Island SPA</li> </ul> |
| <b>Habitat (and species) loss and fragmentation</b> | <ul style="list-style-type: none"> <li>• Northumbria Coast SPA/Ramsar</li> </ul>                                                                                                                                   |
| <b>Coastal Squeeze</b>                              | <ul style="list-style-type: none"> <li>• Northumbria Coast SPA/Ramsar</li> </ul>                                                                                                                                   |
| <b>Disturbance (noise, light, visual)</b>           | <ul style="list-style-type: none"> <li>• Northumbria Coast SPA/Ramsar</li> <li>• Berwickshire and North Northumbria Coast SAC</li> <li>• Coquet Island SPA</li> </ul>                                              |
| <b>Air quality</b>                                  | <ul style="list-style-type: none"> <li>• North Northumberland Dunes SAC</li> <li>• Northumbria Coast SPA/Ramsar</li> </ul>                                                                                         |

6.4.5 **Kingsnorth:** The site is situated in the Medway Estuary on the south coast of the Thames Estuary, the nearest settlements are Kingsnorth and Hoo St Werburgh. Key issues identified by the AA that would require further consideration in project level HRA are:

- Water abstraction and discharge will be directly from a European Site (Medway Estuary and Marshes SPA, Ramsar) and may affect site integrity;
- Habitat loss and fragmentation through the construction of cooling water infrastructure and coastal defences (if required) may have adverse effects on adjacent European sites (Medway Estuary and Marshes SPA, Ramsar, and Thames Estuary and Marshes SPA, Ramsar sites);
- The Medway Estuary SPA, Ramsar in particular supports an extremely high number of internationally important bird assemblages and is immediately adjacent to the Kingsnorth site; qualifying species are particularly vulnerable to disturbance effects;
- Air pollution identified issue for saltmarsh habitat, in-combination adverse effects possible; and
- Potential in-combination effects from, proposed redevelopments at the existing power station on site, planned growth (housing/infrastructure in particular cumulative growth in the Thames Gateway), and recreation strategies.



Table 6.2: Kingsnorth: Appropriate Assessment Summary

| Potential Effects Arising from Development                          | European Sites at which potential adverse effects on site integrity cannot be ruled out                                                                                                                                                                                                  |
|---------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                                  | <ul style="list-style-type: none"> <li>. Medway Estuary and Marshes SPA/Ramsar</li> <li>. Thames Estuary and Marshes SPA/Ramsar</li> <li>. Swale SPA/Ramsar</li> <li>. Benfleet and Southend Marshes SPA/Ramsar</li> </ul>                                                               |
| <b>Habitat (and species) loss and fragmentation/coastal squeeze</b> | <ul style="list-style-type: none"> <li>. Medway Estuary and Marshes SPA/Ramsar</li> <li>. Thames Estuary and Marshes SPA/Ramsar</li> <li>. Swale SPA/Ramsar</li> <li>. Benfleet and Southend Marshes SPA/Ramsar</li> <li>. Essex Estuaries SAC</li> <li>. Foulness SPA/Ramsar</li> </ul> |
| <b>Disturbance (noise, light, visual)</b>                           | <ul style="list-style-type: none"> <li>. Medway Estuary and Marshes SPA/Ramsar</li> <li>. Thames Estuary and Marshes SPA/Ramsar</li> <li>. Swale SPA/Ramsar</li> <li>. Benfleet and Southend Marshes SPA/Ramsar</li> <li>. Essex Estuaries SAC</li> <li>. Foulness SPA/Ramsar</li> </ul> |
| <b>Air quality</b>                                                  | <ul style="list-style-type: none"> <li>. Medway Estuary and Marshes SPA/Ramsar</li> <li>. Thames Estuary and Marshes SPA/Ramsar</li> </ul>                                                                                                                                               |

6.4.6 **Owston Ferry:** The site(s) at Owston Ferry are situated in North Lincolnshire close to the village of Owston Ferry, on the western banks of the River Trent near Low Burnham. Key issues identified by the AA that would require further consideration in project level HRA are:

- Water abstraction and discharge from the River Trent, potential adverse effects on ground water (Thorne Moor SAC) and water flow (Humber Estuary cSAC, Ramsar);
- Potential for adverse effects through habitats (and species) loss and fragmentation as result of water intake (for example, migratory fish, Humber Estuary cSAC) and riverine modifications;
- Qualifying bird species have identified vulnerabilities to disturbance events;
- Humber Estuary cSAC designated habitats, known sensitivities to air pollution, industry sources considered to be contributing to the exceedance of critical loads;
- Potential in-combination effects from, planned growth (housing/infrastructure, ports and harbour developments), and renewables strategies.

Table 6.3: Owston Ferry: Appropriate Assessment Summary

| Potential Effects Arising from Development          | European sites at which adverse effects cannot be ruled out                                                                                                                                                                 |
|-----------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Water resources and quality</b>                  | <ul style="list-style-type: none"> <li>. Humber Estuary cSAC</li> <li>. Humber Estuary Ramsar</li> <li>. Humber Flats, Marshes and Coast SPA</li> <li>. Thorne Moor SAC</li> <li>. Thorne and Hatfield Moors SPA</li> </ul> |
| <b>Habitat (and species) loss and fragmentation</b> | <ul style="list-style-type: none"> <li>. Humber Estuary cSAC</li> <li>. Humber Estuary Ramsar</li> <li>. Humber Flats, Marshes and Coast SPA</li> </ul>                                                                     |
| <b>Disturbance (noise, light, visual)</b>           | <ul style="list-style-type: none"> <li>. Humber Estuary cSAC</li> <li>. Humber Estuary Ramsar</li> <li>. Humber Flats, Marshes and Coast SPA</li> <li>. Thorne and Hatfield Moors SPA</li> </ul>                            |
| <b>Air quality</b>                                  | <ul style="list-style-type: none"> <li>. Humber Estuary cSAC</li> <li>. Humber Estuary Ramsar</li> <li>. Humber Flats, Marshes and Coast SPA</li> </ul>                                                                     |

### Avoidance and Mitigation Measures

- 6.4.7 In line with the approach detailed in Chapter 5 (Section 5.8) the HRA for each alternative site provided recommendations for avoidance and mitigation measures to address the adverse effects identified.
- 6.4.8 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.

# 7. Imperative Reasons of Overriding Public Interest and Compensation

**This chapter outlines the Government's Imperative Reasons of Overriding Public Interest, including the consideration of the zero alternative of not having a plan, for why the plan should proceed given the findings of the HRA presented in chapters 5 and 6. This chapter also sets out a strategic framework for compensation measures in accordance with the provisions of Article 6(4) of the Habitats Directive.**

## 7.1 Habitats Directive Requirements

- 7.1.1 In the absence of alternative solutions and where adverse effects on European Sites remain, or cannot be ruled out, it is necessary to establish Imperative Reasons of Overriding Public Interest (IROPI) for why the plan should proceed (Habitats Directive, Article 6(4)). Where European Sites host priority habitats and species it is necessary to consider whether or not there are human health or public safety considerations or benefits which are of primary importance to the environment flowing from the plan. If IROPI cannot be demonstrated for these criteria then wider socio-economic criteria must be demonstrated and an opinion sought from the European Commission. Compensatory measures that maintain the coherence of the Natura 2000 network must also be identified and established.
- 7.1.2 The Nuclear NPS is a plan for the purposes of the Habitats Directive and has been subject to a HRA including AA.
- 7.1.3 The strategic level AA concluded that the potential for adverse effects on the integrity of European Sites, either from the plan alone, or in combination with other plans, could not be ruled out. The assessment proposed avoidance and mitigation measures but, in the absence of project level detail it has not been possible to conclude beyond reasonable scientific doubt that the identified potential adverse effects on the integrity of European Sites will be effectively avoided or mitigated.
- 7.1.4 In line with the requirements of the Habitats Directive, the assessment went on to consider whether there were alternative solutions to delivering the requirements of the plan that would better respect the integrity of the European Sites considered in the HRA process. The Government here outlines the IROPI that require the NPS to be designated, which includes the assessment of alternatives detailed in paragraph 7.2.2.

## 7.2 Examining Imperative Reasons of Overriding Public Interest

- 7.2.1 As it is not possible at the strategic level of the HRA to rule out potential adverse effects on the integrity of European sites which host priority features, it is necessary to comply with the requirements of Article 6(4) of the Habitats Directive. The IROPI which justifies the plan relates to:
- the protection of human health;
  - public safety; and

- overriding beneficial consequences of primary importance for the environment.

Because the IROPI only relates to these considerations, it is not necessary to seek the opinion of the European Commission in relation to the IROPI case.

7.2.2 Consistent with European Commission guidance<sup>67</sup> that before IROPI can be demonstrated it is necessary to analyse and demonstrate the need for the plan, the alternative of not having the plan, and alternatives ways of meeting the plan, the Government considered:

- why new generating capacity is required;
- why there is a need for nuclear power as part of the generating mix;
- why it is necessary for the sites assessed as potentially suitable to be listed in the revised draft Nuclear NPS and why not sites at different locations; and
- why this revised draft Nuclear NPS is needed.

### Why new generating capacity is needed

7.2.3 Energy underpins almost every aspect of our way of life. It enables us to heat and light our homes; to produce and transport food; to travel to work, around the country and the world. Our businesses and jobs rely on the use of energy. And energy is essential for the critical services we rely on – from hospitals to traffic lights and cash machines. It is difficult to overestimate the extent to which our quality of life is dependent on adequate energy supplies.

7.2.4 Part 2 of EN-1 explains the two key policy goals that drive the need for new electricity generation. The first is the need to decarbonise the economy. The second is that it is critical that the UK continues to have secure and reliable supplies of electricity as we make the transition to a low carbon economy. To do this, we need sufficient capacity to meet demand at all times (including a sufficient capacity margin). We also need a diverse mix of technologies and fuels, so that we do not rely on any one technology or fuel.

7.2.5 To meet the Government's objective to maintain or enhance levels of energy security, and because as explained above electricity is an essential component of any modern society, there is a need to replace capacity as well as to meet expected increases in demand for electricity generation. The option of not doing so is not tenable because of the harmful impacts on human health and public safety as a result of interruptions to electricity supply. As set out in EN-1 (Overarching National Policy Statement for Energy) a significant amount of existing generating capacity (about 22GW) is due to close by 2025 either because it does not meet European emission standards or because power stations are coming to the end of their natural operating lives.

7.2.6 The UK is committed to reducing greenhouse gas emissions by at least 80% by 2050, relative to 1990 levels<sup>68</sup>. The Committee on Climate Change has stated that in order to achieve this there is a need for the supply of electricity to be almost entirely

<sup>67</sup> European Commission (January 2007) *Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, Opinion of the Commission, Guidance Document on Article 6(4) of the Habitats Directive*, paragraph 1.3.1

<sup>68</sup> The 2050 target is enshrined in the Climate Change Act 2008.

decarbonised by 2050<sup>69</sup>. This is a very significant undertaking and it is therefore essential that no form of low carbon generation (for example, renewables, fossil fuels with carbon capture and storage (CCS) and nuclear power) is ruled out. EN-1 sets out the need for renewables, nuclear and fossil fuels with CCS.

- 7.2.7 EN-1 considers in detail the possible alternatives to adding new generation capacity - demand reduction; more intelligent use of electricity; and the increased interconnection of electricity systems. The Government believes that although increased energy efficiency, smart demand management and opportunities for increased storage and interconnection are being actively pursued and are important, their effect on the need for new large scale energy infrastructure will be limited due to increased need for electricity for domestic and industrial heating and transport<sup>70</sup>. Strategies to reduce demand and improve energy efficiency are therefore complementary, rather than an alternative to new generating capacity. The Government has considered the likely scale of the need for new capacity that could be required by 2025. The Updated Energy and Emissions Projections show, assuming that demand for electricity in 2025 is at similar levels to today, in one scenario around 59GW of new capacity will be required by the end of 2025<sup>71</sup>.
- 7.2.8 The UEP scenarios all assume that electricity demand in 2025 will be at approximately the same levels as today. Whilst increased energy efficiency measures and the impact of the recent recession mean that some industry models support this assumption<sup>72</sup>, it is quite possible that any of these scenarios may underestimate the increased use of electricity by 2025 as the UK moves to decarbonise. This means that the amount of new capacity shown in the scenarios (including the high scenario considered above) may be too low.
- 7.2.9 The revised draft Nuclear NPS has focused upon 2025 because of the importance of listing sites which can come on stream in good time to contribute to the Government's objectives on climate change and energy security. However, in relation to consents that may be given to sites that could be deployed before the end of 2025, the Government also has to look beyond the demand in 2025, in the context of how the UK will move to a secure low carbon economy by 2050. This is because new energy infrastructure which is consented in the next 10 to 15 years will still be generating electricity for 30 to 60 years and therefore has long term implications for energy security and carbon reduction. Paragraphs 7.2.10 to and 7.2.14 examine below the need to 2050 for this purpose.
- 7.2.10 Beyond 2025 the increased use of electricity as a way of decarbonising the economy is likely to increase the demand for electricity. The Government's 2050 Pathways Analysis considers different scenarios by which the UK can move to a secure low carbon economy by 2050<sup>73</sup>. Whilst there are different pathways by which the UK can reach its 2050 objectives, common themes from the different pathways have emerged which show that:

<sup>69</sup> The Climate on Change Committee has said that the UK will need to decarbonise the electricity system by 75% by 2030 to meet the 2050 target.

<sup>70</sup> Part 3 of EN-1

<sup>71</sup> DECC (2010) *Updated Energy and Emissions Projections*. The scenario used is the high fossil fuel and carbon prices scenario. It should be noted that there is a significant amount of uncertainty in forecasting future demand and capacity. EN-1 sets out that Government considers it appropriate to consider the high scenario because it is prudent to plan for the greatest potential need for new electricity generating infrastructure. To do otherwise would create an unacceptable risk to the delivery of secure, affordable low carbon energy supplies.

<sup>72</sup> National Grid projections (published in April 2010) suggest in some scenarios that electricity demand may remain at today's levels in 2025.

<sup>73</sup> The 2050 Pathways Analysis was published as part of a call for evidence in July 2010 [http://econsultation.decc.gov.uk/decc-executive/2050\\_pathways/consult\\_view](http://econsultation.decc.gov.uk/decc-executive/2050_pathways/consult_view).

- ambitious per capita demand reduction is needed and the greater the constraints on low carbon energy supply the greater the reduction in demand will need to be;
- a substantial level of electrification of heating, transport and industry will be required;
- electricity demand could double by 2050 from present levels; and
- the electricity supply will need to be decarbonised.

7.2.11 The 2050 Pathways Analysis shows that reductions in electricity consumption resulting in improvements from energy efficiency will be far outweighed by increases in electricity demand potentially leading to a doubling of electricity demand between now and 2050. If electricity demand were to double, generation capacity would also need to double if it was supplied by fossil fuels with CCS and nuclear. If one third of the electricity were to be supplied by renewables, generation capacity would need to triple because more capacity would be needed to account for the intermittency of renewables.

7.2.12 The Government considers it prudent to plan on the basis that:

- a minimum of 59GW of new generating capacity could be required by 2025;
- electricity demand could in fact double by 2050 meaning that capacity could also need to double;
- the electricity supply needs to be decarbonised and in doing so we need to retain security of our supplies; and
- that investment decisions made in the short term on electricity generating infrastructure will have long term consequences.

7.2.13 The Government has considered its objectives of ensuring security of supply whilst combating climate change, in the face of increased demand and capacity needing to be replaced. It has considered the alternatives of relying on energy efficiency measures, the likely demand for new capacity by 2025 and the themes from the 2050 Pathways Analysis which show that, in the longer term, demand for electricity could double by 2050 and that electricity supply needs to be decarbonised. Having considered the alternatives, there are IROPI in allowing for the provision of new generation capacity because security of the electricity supply is essential for the maintenance of human health and public safety and because combating climate change (which is one of the factors creating the demand for new generating capacity) will have beneficial consequences of primary importance for the environment.

### **Why there is a need for nuclear power as part of the generating mix**

7.2.14 For the UK to meet its energy and climate change objectives, the Government believes that there is an urgent need for new electricity generation plant including new nuclear power. Nuclear power generation is a low carbon, proven technology, which is anticipated to play an increasingly important role as we move to diversify and decarbonise our sources of electricity.

7.2.15 A large proportion of the new generation capacity that is needed by 2025 and in the longer term will be met by renewable generation. However, there is still a need for new conventional thermal generation. For example in the Updated Energy and Emissions

Projections scenario cited above, suggests that of the 59GW of new capacity which will be needed by 2025, around 33GW will need to come from renewable sources to meet the 2020 15% EU renewable target<sup>74</sup>. The remaining 26GW<sup>75</sup> would be met by conventional thermal generation (in the projections this includes nuclear power).

- 7.2.16 The UK needs additional conventional thermal generation because renewables alone are not capable on their own of meeting our future needs for electricity generation because of the need for a diverse energy mix in order to achieve security of supply and also because of their inherent intermittency. The characteristics of nuclear power, explained in detail in EN-1, are very different from those of conventional fossil fuel or renewable generation<sup>76</sup>, and the presence of nuclear in the energy mix will be important for security of supply. New nuclear stations are important in this respect as the existing stations will reach the end of their lives towards 2020. Therefore renewables are not a realistic alternative to conventional thermal generation even when combined with energy efficiency and demand reduction.
- 7.2.17 In order to secure energy supplies that enable us to meet our targets for 2050 and beyond, there is an urgent need for new low carbon electricity capacity to be brought forward as soon as possible, and certainly in the next 10 to 15 years given the crucial role of electricity as the UK decarbonises its power sector.
- 7.2.18 Nuclear generation is low carbon<sup>77</sup>. The only other conventional thermal generating technology that has the potential to be low-carbon is fossil fuels with CCS.
- 7.2.19 However the complete chain of CCS has yet to be demonstrated at a commercial scale on a power station and there is uncertainty about the future deployment of CCS in the economy. As set out in Part 3 of EN-1, the expectation is that any new coal fired power stations constructed after 2020 will install CCS for the entire power station at the outset, and that previously consented power stations will fully retrofit by 2025. Having said this, the impact of CCS on the economics of power station operation is as yet uncertain. We therefore cannot at this stage rely on CCS as an alternative to nuclear to provide low carbon electricity to meet the UK's needs. Nuclear is the only non-renewable low carbon technology that is currently proven and can be deployed on a large scale<sup>78</sup>. In any event the need for diversity of sources and the difficulty of the task of decarbonisation suggests that we need both nuclear and CCS.
- 7.2.20 There are IROPI in providing new nuclear generating capacity in order to provide our future energy security in a way which minimises carbon emissions, thus securing public safety, public health and in combating climate change, beneficial consequences of primary importance to the environment.

### **Why it is necessary for the sites assessed as potentially suitable to be listed in the revised draft Nuclear NPS and why not sites at different locations**

- 7.2.21 To contribute to the delivery of the Government's objectives of energy security and decarbonisation the Government believes that in principle nuclear should be free to

<sup>74</sup> National Grid projections (published in April 2010) suggest in some scenarios that electricity demand may remain at today's levels by 2025.

<sup>75</sup> There is currently 8GW out of this 26GW already under construction. See Part 3 of EN-1.

<sup>76</sup> DTI (2007) *The role of Nuclear Power in a Low Carbon Economy, Consultation Document*, p14, p55.

<sup>77</sup> Part 3 of EN-1

<sup>78</sup> DTIR (2007) *The role of Nuclear Power in a Low Carbon Economy, Consultation Document*, p14, p55.

contribute as much as possible towards meeting the future need for new capacity, up to the end of 2025 and beyond<sup>79</sup>. To ensure that the NPS does not act as a restraint on the ability of energy companies to provide this capacity from nuclear power, it is therefore essential that the NPS has sufficient sites to allow nuclear to contribute as much as possible towards meeting the need for new non-renewable capacity.

- 7.2.22 The locations listed in the revised draft Nuclear NPS are locations that have been assessed against a range of criteria developed by the Government through extensive consultation with the public, statutory consultees and energy companies and have been identified as being potentially suitable for the deployment of new nuclear power stations by the end of 2025.
- 7.2.23 The Government does not believe that there are any alternative sites. Three of the sites (Dungeness, Braystones and Kirksanton) which were nominated into the SSA were not found to be potentially suitable and are thus not considered feasible alternatives. Of these three sites, two (Braystones and Kirksanton) were deemed to be not capable of deployment by the end of 2025 and thus not capable of meeting the objectives of the NPS and also failed on discretionary criterion D8 (areas of amenity, cultural heritage and landscape value). The final site (Dungeness) failed on the grounds of the particular harm to European sites that the HRA found would flow from its development<sup>80</sup>. Given this particular harm, and the availability of the other eight sites to fill the need where the HRA reports did not rule out mitigation at project level for potential adverse effects identified, the site was excluded from the plan.
- 7.2.24 The Government also commissioned a study to identify whether there might be any sites, other than those nominated through the SSA process, which are potentially suitable for the deployment of new nuclear power stations by the end of 2025 and which better respect the integrity of European Sites. The study screened the whole of England and Wales using sophisticated modelling techniques and a methodology very similar to the SSA criteria used to assess nominated sites. The study revealed three sites (Owston Ferry, Druridge Bay and Kingsnorth) as worthy of further consideration, but the Government determined that they were not potentially suitable because they were not credible for deployment by the end of 2025 and thus could not meet the objectives of the NPS<sup>81</sup>.
- 7.2.25 There can be no certainty that development consent on all the sites listed in the NPS will be granted as issues may emerge once they are analysed by the IPC, so there is a need to provide sufficient sites to allow sufficient flexibility for developers to meet the urgent need for new nuclear power stations whilst enabling the IPC to refuse consent should it consider it appropriate to do so.
- 7.2.26 The Government has therefore concluded that in relation to the designation of the NPS the eight sites are not alternatives to each other and it is necessary to include all of the

<sup>79</sup> 18% of the UK's current electricity supply comes from the existing nuclear power stations.

<sup>80</sup> DECC (2009) *Consultation on draft National Policy Statements for energy infrastructure*  
<http://data.energynpsconsultation.decc.gov.uk/documents/condoc.pdf>

<sup>81</sup> Prior to finally determining that the three sites were not alternative solutions, the Government carried out an HRA on each of the three sites in an identical manner to those sites nominated through the SSA process. The Government found that potential adverse effects could not be ruled out at a strategic level and they were therefore no better or worse than the nominated sites in relation to their potential effects on European Sites.



eight sites that were found to be potentially suitable by the SSA in the NPS to ensure that sufficient sites are available<sup>82</sup>.

7.2.27 Enabling the IPC (where it considers it appropriate) to permit the development of nuclear power stations on any or all of the eight sites is considered necessary to achieve our objective of achieving security of electricity supply while minimising carbon emissions. Alternatives to new electricity generation, to thermal energy generation, to nuclear power, and to the sites listed in the revised draft Nuclear NPS have been considered. It has been demonstrated that none of these alternatives can be relied on to meet the objective of the plan within the necessary timescales. There are IROPI for including all of the potentially suitable sites in the revised draft Nuclear NPS. Doing this will contribute to the maintenance of human health, and public safety and has beneficial consequences of primary importance for the environment.

### Why this revised draft Nuclear NPS is needed

7.2.28 The Nuclear NPS enables the delivery of one of the key principles of the new planning system for nationally significant infrastructure projects pursuant to the Planning Act 2008; namely that the IPC (or its successor) should consider urgently needed infrastructure in a timely fashion and decisions should be taken without delay. The national need for the infrastructure has been established by Government (as set out in EN-1). When the IPC considers an individual application it should therefore act on the basis that the need for such development has been demonstrated and should be given substantial weight. The Nuclear NPS together with EN-1 sets out the policy that the IPC should act in accordance with when considering applications for new nuclear development. Without having to consider the detail of the need case, the IPC will be able to focus on the impacts of the development, taking into account the views of local people and local authorities and relevant environmental and regulatory assessments.

7.2.29 Setting out planning policy (including a strong expression of the need for new energy infrastructure and a list of potentially suitable sites) in the Nuclear NPS will result in a more streamlined planning system with enhanced certainty for developers. Continuing delays in the planning process would add to uncertainty for energy companies and could result in them choosing to invest in other generation technologies or in other countries. This would make it more difficult for the UK Government to meet its energy policy objectives of urgently tackling climate change, ensuring security of supply, supporting vulnerable consumers and decarbonising the economy.

7.2.30 The Government has considered alternative approaches to the development of the Nuclear NPS and concluded that the potential for likely significant effects on European sites would be best managed by a Nuclear NPS with siting criteria and a list of potentially suitable sites<sup>83</sup>.

7.2.31 In the light of the Government's objective of having a NPS setting out the need for nuclear power and a list of potentially suitable sites, and having considered that the alternative of not having one would be likely to cause delay and uncertainty in the planning system, there are IROPI for a Nuclear NPS which makes sufficient sites

<sup>82</sup> In the illustrative Updated Energy and Emissions Projections scenario cited above and in EN-1, there is a balance of 18GW to come from new non-renewable capacity. Although it is not possible to predict whether or not there will be a reactor or more than one reactor at each of the eight sites included in the NPS, a single reactor at each of the sites would result in around 10GW to 14GW of nuclear capacity, depending upon the reactor technology chosen.

<sup>83</sup> See Chapter 3 of this report.

available for development, to allow energy companies to generate as much electricity as possible from nuclear power on them.

### 7.3 Imperative Reasons of Overriding Public Interest

- 7.3.1 Because of the urgent need to reduce carbon dioxide emissions in order to avoid significant, long-term adverse environmental, social and economic consequences, whilst maintaining security of energy supply and preserving public safety and public health, the Government believes that nuclear generation needs to be part of the future low carbon electricity generation mix.
- 7.3.2 Paragraphs 7.2.3 to 7.2.20 of this analysis have demonstrated the reasons why new nuclear power stations are needed in order for the Government to meet its climate change and energy security objectives. There is therefore a need to allow energy companies to build new nuclear power stations because alternative technologies or approaches will not meet this need.
- 7.3.3 Paragraphs 7.2.21 to 7.2.27 of the analysis explain how the Government has considered the 11 nominated sites against strategic criteria and a Habitats Regulations Assessment, and concluded that eight are potentially suitable for the development of new nuclear power stations. It has considered whether any non-nominated sites might be considered to be potentially suitable, but has concluded that there are none that meet the SSA criteria and can be shown to be capable of deployment before the end of 2025.
- 7.3.4 Given the urgent need for new nuclear power stations and the fact that the Government does not believe that there are any sites that meet the criteria to be considered potentially suitable for new nuclear development, the Government has concluded that it is necessary to include all of the eight potentially suitable sites in the revised draft Nuclear NPS. This therefore provides sufficient flexibility for developers to meet the urgent need for new nuclear power stations whilst enabling the IPC to refuse consent should it consider it appropriate to do so.
- 7.3.5 Paragraphs 7.2.28 to 7.2.31 of this analysis, informed by the Appraisal of Sustainability, explain why having a Nuclear NPS which lists sites is the most effective way of enabling energy companies to make the necessary investments in new nuclear power stations. The alternatives of not having an NPS, or having an NPS constructed in a different way, would not be compatible with the Government objectives, which require rapid de-carbonisation of the generation mix.
- 7.3.6 The Government is therefore satisfied that there are IROPI in making these eight sites available as potential sites for development (subject to the IPC's detailed consideration of the proposals for any site on which an application comes forward) and listing them in the Nuclear NPS even though at this stage potential adverse impacts on European sites cannot be ruled out. This IROPI case is based on fulfilling the Government's energy policy objectives whilst contributing to wider EU goals for sustainable low-carbon sources of energy as a means of reducing the damaging effects of climate change and ensuring security of energy supplies.
- 7.3.7 Development proposals will, among other things, need to show that any potential damage to European Sites is fully mitigated, or if, at that stage, adverse impacts are confirmed in respect of development on one of the listed sites, then the developer will be required to follow the requirements set out by the Habitats Directive, including, if

necessary, consideration of alternatives at the project level, consideration of IROPI and the development and implementation of compensatory measures in line with the strategic measures set out below. [The Government's findings in respect of Article 6\(4\) of the Habitats Directive and the Nuclear NPS do not automatically transfer directly to individual projects](#) and the Nuclear NPS does not in any way reduce the duty on the IPC to fulfil the legal requirements of the Habitats Directive.

## 7.4 Compensatory Measures

- 7.4.1 Article 6(4) of the Habitats Directive (Regulation 105 of the Habitats Regulations) requires that where, in spite of a negative assessment on Natura 2000 site(s) integrity, the competent authority proceeds with the plan on the basis of IROPI, any necessary compensatory measures are taken to ensure that the overall coherence of the Natura 2000 network is protected.
- 7.4.2 Given the strategic nature of the HRA process for this NPS, the inherent uncertainties of the AA conclusions, and the potential changes that may occur as the plan is implemented<sup>84</sup>, it is not possible at this stage to specify the precise nature or location of any compensation measures that might be required.
- 7.4.3 The role of the plan is, therefore, to provide a robust framework through the direction it provides to the IPC that sets out the broad parameters for compensation measures, should they be required following the more detailed site level assessments undertaken for plan implementation.
- 7.4.4 All project level HRAs must take account of the potential adverse effects and the proposed avoidance and mitigation measures identified through the strategic level assessment(s).
- Appropriate for the area and the loss caused by the project;
  - Capable of protecting the overall coherence of the Natura 2000 network;
  - Capable of implementation;
  - Ensure that, the Natura 2000 site is not irreversibly affected by the project before the compensation is in place;
  - Directed in measurable proportions to the habitats and species negatively affected;
  - Related to the same biogeographical region (within the UK) and should be as close as possible to the habitat that has been negatively affected;
  - Serving functions that are comparable to those that motivated the original area's submission for designation; and
  - Clearly defined, with implementation goals and managed so that the compensatory measures can achieve the goal of maintaining the overall coherence of Natura 2000.

<sup>84</sup> The HRA of the NPS has noted that avoidance and mitigation measures proposed by the assessment may minimise effects (to the point where integrity is no longer affected) or cancel out the negative impacts predicted such that the site level developments may proceed without the need to meet additional requirements under the Habitats Directive.

- 7.4.5 In accordance with the findings of the strategic level HRA, possible strategic level compensation measures for the European Sites identified as potentially affected by the Nuclear NPS, are summarised below. These measures are indicative of the types of compensation that may be necessary at the coastal, estuary and river sites identified as potentially affected in the findings of the HRA of the revised draft Nuclear NPS.
- 7.4.6 Actual compensation measures can only be effectively determined at a project level stage through the findings of detailed, site specific Appropriate Assessments focused on the requirements of the Habitats Directive to ensure the ecological functionality of individual European Sites.

Figure 7.1: Possible Compensatory Measures

#### Possible Compensatory Measures

- . Saltmarsh reconstruction
- . Artificial tidal flats reconstruction
- . Sediment feeding, management and monitoring
- . Managed realignment of coast to create inter-tidal habitats (breeding/feeding grounds)
- . Littoral habitat (re)creation (beaches and dunes)
- . Submerged habitats creation
- . Creation of marine/river reserves
- . Enlargement/extension of habitat areas, for example, through enhancement of or restoration of adjacent, surrounding or linked land
- . Restoration wetland areas, for example, through flooding of existing crop/pasture land
- . Enhance/create spawning habitat.

# 8. Monitoring

## 8.1 Monitoring Requirements

- 8.1.1 While monitoring in relation to plans or projects is not specified by the Habitats Directive, it is good practice and guidance suggests that monitoring the effects of plan implementation in relation to the issues identified through HRA is undertaken. This is in accordance with wider monitoring requirements for plans and projects as set out in the new planning system (under PPS 12), the SEA Directive and Regulations, the Biodiversity Action Plan process and in the UK Sustainable Development Strategy (through Sustainable Development indicators).
- 8.1.2 Monitoring (defined here as the assessment of ecological conditions during the construction, operation and decommissioning of a development) is also considered integral to ensuring that the avoidance and mitigation measures suggested in this report and the site level HRA Reports are implemented and effective in avoiding potential adverse effects on European Sites. Monitoring will also support the review and validation of the HRA and AoS findings.
- 8.1.3 The statutory bodies (CCW, NE and the EA) are responsible for the periodic monitoring of certain environmental resources at European Sites, including factors which affect the general condition of European Sites (as established through agreed management plans and protocols at local level) and the condition of their constituent SSSIs (generally every 6 years), as well as water quality (by the EA) and shoreline management (through the Shoreline Management Programme process).
- 8.1.4 Additional suggestions for monitoring over and above existing monitoring activities should be identified at project level, taking forward advice in this report (and the AoS) which will need to be integrated and linked into existing and future management plans (for example, construction and decommissioning management plans).
- 8.1.5 There is therefore a role for the IPC in setting the requirements for monitoring through pre-application requirements for information and EIA and HRA scoping, and for enforcing these requirements. Implementation and reporting of monitoring should be the responsibility of the developers and statutory bodies. The results of monitoring should be used to inform assessments (at agreed suitable intervals) of the condition of the European Site(s) and qualifying features, with a feedback loop to the implementation of the project to take account of any potential adverse impacts being identified. The results of monitoring may therefore trigger adjustments to site management practices, or possibly be used to direct more detailed investigations into reasons for apparent changes in environmental condition.

## 8.2 Monitoring Examples

- 8.2.1 Examples of monitoring arising from the finding of the strategic level HRA process that should be considered in more detail at project level by the IPC and developers include:
- the success of proposed technologies and operating practices in avoiding effects upon identified sensitive fish populations (breeding and feeding cycles of migratory

fish such as allis and shad) in particular in European Sites around Hinkley Point, Oldbury, and Sellafield;

- the effects of developments on the inter-tidal estuarine habitats around Morecambe Bay SAC and SPA/Ramsar site and Duddon Estuary SPA and Ramsar site, including sensitive communities of *Zostera* spp. (eel grass communities) and saltmarsh, around Heysham;
- the success of any enhancements or habitats created that support qualifying migratory and breeding bird species, for example where infrastructure works potentially impinge onto sensitive habitats within European Sites at Heysham, Hartlepool, Bradwell and Wylfa;
- the cumulative effects on Natterjack Toad populations, which have a restricted range in the UK, with a large proportion associated with 5 estuaries,
- where potential cumulative disturbance impacts are predicted on migratory birds such as Bewick's Swan on the Severn Estuary SAC/SPA/Ramsar site as a result of the decommissioning of existing nuclear power stations and construction of new power stations at Hinkley Point and Oldbury;
- the impacts of disturbance and nitrogen deposition on breeding Little Terns, for example at and around Hartlepool, Sizewell and Bradwell;
- the impacts of disturbance on over-wintering birds, for example at and around Hartlepool, Bradwell and Sizewell.

# List of Acronyms

|                       |                                                        |
|-----------------------|--------------------------------------------------------|
| <b>AA</b>             | Appropriate Assessment                                 |
| <b>ALARA</b>          | As Low As Reasonably Achievable                        |
| <b>AoS</b>            | Appraisal of Sustainability                            |
| <b>APIS</b>           | UK Air Pollution Information System                    |
| <b>BAT</b>            | Best Available Technology                              |
| <b>CAMS</b>           | Catchment Abstraction Management Strategy              |
| <b>CCS</b>            | Carbon Capture and Storage                             |
| <b>CCW</b>            | Countryside Council for Wales                          |
| <b>CEMP</b>           | Construction and Environmental Management Plan         |
| <b>CNPO</b>           | Credible Nuclear Power Operator                        |
| <b>CHaMPs</b>         | Coastal Habitat Management Plans                       |
| <b>cSAC</b>           | Candidate Special Area of Conservation                 |
| <b>DECC</b>           | Department of Energy and Climate Change                |
| <b>DoENI</b>          | Department of Environment, Northern Ireland            |
| <b>EA</b>             | Environment Agency                                     |
| <b>EC</b>             | European Commission                                    |
| <b>EEC</b>            | European Economic Community                            |
| <b>EIA</b>            | Environmental Impact Assessment                        |
| <b>EN-1</b>           | Overarching National Policy Statement for Energy       |
| <b>EN-6</b>           | National Policy Statement for Nuclear Power Generation |
| <b>ES</b>             | Environmental Statement                                |
| <b>FRMS</b>           | Flood Risk Management Strategy                         |
| <b>GW</b>             | Giga Watts                                             |
| <b>HRA</b>            | Habitats Regulations Assessment                        |
| <b>ICZM</b>           | Integrated Coastal Zone Management                     |
| <b>IPC</b>            | Infrastructure Planning Commission                     |
| <b>IROPI</b>          | Imperative Reasons of Overriding Public Interest       |
| <b>JNCC</b>           | Joint Nature Conservation Committee                    |
| <b>LA</b>             | Local Authority                                        |
| <b>LDF</b>            | Local Development Framework                            |
| <b>LSE</b>            | Likely Significant Effect                              |
| <b>LTP</b>            | Local Transport Plan                                   |
| <b>NE</b>             | Natural England                                        |
| <b>N<sub>3</sub>H</b> | Ammonia                                                |
| <b>N2K</b>            | Natura 2000 sites                                      |
| <b>N<sub>x</sub>O</b> | Nitrogen Oxide                                         |

|                       |                                                            |
|-----------------------|------------------------------------------------------------|
| <b>NPS</b>            | National Policy Statement(s)                               |
| <b>NNR</b>            | National Nature Reserve                                    |
| <b>PP</b>             | Plans and Projects                                         |
| <b>pSPA</b>           | Potential Special Protection Area                          |
| <b>pRamsar</b>        | Potential Wetland Site designated by the Ramsar convention |
| <b>Ramsar</b>         | Wetland Sites designated by the Ramsar Convention          |
| <b>RoC</b>            | Review of Consents                                         |
| <b>RSPB</b>           | Royal Society for the Protection of Birds                  |
| <b>RSS</b>            | Regional Spatial Strategy                                  |
| <b>SAC</b>            | Special Area of Conservation                               |
| <b>SCI</b>            | Site of Community Importance                               |
| <b>SNH</b>            | Scottish Natural Heritage                                  |
| <b>SO<sub>2</sub></b> | Sulphur Dioxide                                            |
| <b>SMP</b>            | Shoreline Management Plan                                  |
| <b>SMP</b>            | Site Management Plan                                       |
| <b>SPA</b>            | Special Protection Area                                    |
| <b>SSA</b>            | Strategic Siting Assessment                                |
| <b>SSSI</b>           | Site of Special Scientific Interest                        |
| <b>SuDS</b>           | Sustainable Drainage Systems                               |
| <b>TAN</b>            | Technical Advice Note                                      |
| <b>WAG</b>            | Welsh Assembly Government                                  |
| <b>WeBs</b>           | Wetland Bird Survey                                        |
| <b>WC</b>             | Water Companies                                            |
| <b>WRMU</b>           | Water Resource Management Unit                             |
| <b>WSP</b>            | Wales Spatial Plan                                         |



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