DEPARTMENT OF ENERGY & CLIMATE CHANGE

Appendices to the Appraisal of Sustainability Site Report for Hinkley Point

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

Planning for new energy infrastructure **October 2010**

Appraisal of Sustainability of the revised draft Nuclear National Policy Statement

The Appraisal of Sustainability (AoS), incorporating Strategic Environmental Assessment, of the revised draft Nuclear National Policy Statement (Nuclear NPS) has been undertaken at a strategic level. It considers the effects of the proposed policy at a national level and the sites to be assessed for their suitability for the deployment of new nuclear power stations by 2025. These strategic appraisals are part of an ongoing assessment process that started in March 2008 and, following completion of this AoS, will continue with project level assessments when developers make applications for development consent in relation to specific projects. Applications for development consents to the Infrastructure Planning Commission will need to be accompanied by an Environmental Statement having been the subject of a detailed Environmental Impact Assessment.

The AoS/SEA Reports are presented in the following documents:

AoS Non-Technical Summary

Main AoS Report of revised draft Nuclear NPS
Introduction
Approach and Methods
Alternatives
Radioactive Waste
Findings
Summary of Sites
Technical Appendices

Annexes to Main AoS Report: Reports on Sites
Site AoS Reports
Technical Appendices

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

This document is the Appendices to the Appraisal of Sustainability Site Report for Hinkley Point.

These appendices have been prepared by the Department of Energy and Climate Change with expert input from a team of specialist planning and environmental consultancies led by MWH UK Ltd with Enfusion Ltd, Nicholas Pearsons Associates Ltd, Studsvik UK Ltd and Metoc plc.

Contents

Appendix 1: Sustainable Development Themes and Appraisal of Sustainability Objectives

*** Note: additional decision-aiding questions to aid appraisal have been added in red text.**

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)	Guide Questions
Air Quality	
12. To avoid adverse impacts on air quality	Will it result in the release of low level radionuclides that may adversely affect human health or biodiversity? Will it contribute to an increase in the number or expansion of AQMAs?
Biodiversity and Ecosystem Services	
1. To avoid adverse impacts on the integrity of wildlife sites of international and national importance 2. To avoid adverse impacts on valuable ecological networks and ecosystem functionality 3. To avoid adverse impacts on Priority Habitats and Species including European Protected Species	Will it result in the loss of habitats of international/national importance? Will it affect other statutory or non-statutory wildlife sites? Will it result in harm to internationally or nationally important or protected species? Will it adversely affect the achievement of favourable conservation status for internationally and nationally important wildlife sites? Will it affect the structure and function/ecosystem processes that are essential to restoring, securing and/or maintaining favourable condition of a feature or a site? Will the proposal enable the BAP targets for maintenance, restoration and expansion to be met? Will the proposal result in changes to coastal evolution that is otherwise needed to sustain coastal habitats? Will it result in the release of harmful substances for example oil, fuel and other pollution into waterbodies which could affect aquatic ecosystems? Will it result in the accidental migration of radionuclides which could harm aquatic or terrestrial ecosystems? Will it result in changes to stream hydrology and morphology that could affect aquatic or terrestrial ecosystems? Will it result in thermal discharges that could adversely affect aquatic ecosystems? Will it result in soil contamination that could damage aquatic or terrestrial ecosystems?
Climate Change	
13. To minimise greenhouse gas emissions	Will it take account of future effects and risks of climate change for example sea level rise? Will future changes in weather patterns be considered? Will it result in increased vehicular emissions (particularly carbon dioxide)? Will it result in increased emissions from asset construction, maintenance and demolition, waste recycling and disposal or other activities ?

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)	Guide Questions
	Note: Adaptation to climate change is discussed in other relevant topic appraisals, eg. biodiversity, water, flood risk.
Communities: Population, Employment and Viability	
4. To create employment opportunities 5. To encourage the development of sustainable communities 10. To avoid adverse impacts on property and land values and avoid planning blight	Will it create both temporary and permanent jobs in areas of need? Will it result in in-migration of population? Will it result in out-migration of population? Will it affect the population dynamics of nearby communities (age-structure)? Will it result in a decrease in property and land values as a result of a change in perceptions or blight?
Communities: Supporting Infrastructure	
8. To avoid adverse impacts on the function and efficiency of the strategic transport infrastructure 9. To avoid disruption to basic services and infrastructure	Will it result in changes to services and service capacity in population centres? Will it result in the direct loss of strategic road/rail/air/port infrastructure? Will it result in increased congestion/pressure on key transport infrastructure? Will it result in loss or disruption to basic services and infrastructure (for example electricity, gas)? Will it place significant pressure on local/regional waste management facilities (non-nuclear waste)?
Human Health and Well-Being	
6. To avoid adverse impacts on physical health 7. To avoid adverse impacts on mental health 11. To avoid the loss of access and recreational opportunities, their quality and user convenience	Will it adversely affect the health of local communities through accidental radioactive discharges or exposure to radiation? Will the storage of radioactive waste result in adverse physical and mental health effects for local communities? Will exposure to noise and vibration as a result of plant activities lead to physical and mental health impacts on nearby communities? Will it adversely affect the health of the workforce? Will the perceptions of adverse risk as a result of activities lead to adverse impacts on mental health for nearby communities? Will it result in the loss of recreational and amenity land or loss of access? Will it adversely affect the ability of an individual to enjoy and pursue a healthy lifestyle?
Cultural Heritage	
22. To avoid adverse impacts on the internationally and nationally important features of the historic environment.	Will it adversely affect historic sites of international/national importance and their setting? Will it adversely affect other historic sites of known value? Will it adversely affect landscapes of historic importance?

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)	Guide Questions
23. To avoid adverse impacts on the setting and quality of built heritage, archaeology and historic landscapes	
Landscape	
24. To avoid adverse impacts on nationally important landscapes 25. To avoid adverse impacts on landscape character, quality and tranquillity, diversity and distinctiveness	Will it adversely affect landscapes within or immediately adjacent to a National Park? Will it adversely affect landscapes in or immediately adjacent to an AONB or National Scenic Area? Will it adversely affect Heritage Coast or Preferred Conservation Zones? Will it adversely affect local landscapes/townscapes of value? Will it affect the levels of tranquillity in an area? Will it adversely affect the landscape character or distinctiveness? Will it result in increased levels of light pollution?
Soils, Geology and Land Use	
19. To avoid damage to geological resources 20. To avoid the use of greenfield land and encourage the re-use of brownfield sites 21. To avoid the contamination of soils and adverse impacts on soil functions	Will it result in the compaction and erosion of soils? Will it lead to the removal or alteration of soil structure and function? Will it lead to the contamination of soils which would affect biodiversity and human health? Will it compromise the future extraction/ use of geological/ mineral reserves? Will it result in the loss of agricultural land? Will it lead to damage to geological SSSIs and other geological sites? Will it result in the loss of Greenfield land? Will it adversely affect land under land management agreements?
Water: Hydrology and Geomorphology	
15. To avoid adverse impacts on surface water hydrology and channel geomorphology (including coastal geomorphology)	Will it result in the increased sedimentation of watercourses? Will it adversely affect channel geomorphology? Will hydrology and flow regimes be adversely affected by water abstraction? Will it result in demand for higher defence standards that will impact on coastal processes? Can the higher defence standards be achieved without compromising habitat quality and sediment transport?
Water: Water Quality (including surface, coastal and marine)	
16. To avoid adverse impacts on surface water quality (including coastal and marine water quality) and assist	Will it cause deterioration in surface water quality as a result of accidental pollution, for example spillages, leaks? Will it cause deterioration in coastal and / or marine water quality as a result of accidental pollution, for example

AoS/SEA Objective (Numbers refer to Scoping Report and Environmental Study)		Guide Questions
	achievement of Water Framework Directive objectives	spillages, leaks? Will it cause deterioration in surface water quality as a result of the disturbance of contaminated soil? Will it cause deterioration in coastal and / or marine water as a result of the disturbance of contaminated soil? Will it affect designated Shellfish Waters? Will it affect Freshwater Fish Directive sites? Will it increase turbidity in water bodies? Will it increase the temperature of the water in water bodies?
Water: Water Supply and Demand		
17.	To avoid adverse impacts on the supply of water resources	Will it adversely affect water supply as a result of abstraction? Will it increase demand for water?
Water: Groundwater Quality and Flow		
18.	To avoid adverse impacts on groundwater quality, distribution and flow and assist achievement of Water Framework Directive objectives	Will it cause deterioration in groundwater quality as a result of accidental pollution, for example spillages, leaks? Will it cause deterioration in groundwater quality as a result of the disturbance of contaminated soil?
Flood Risk		
14.	To avoid increased flood risk (including coastal flood risk) and seek to reduce risks where possible	Will it result in demand for higher defence standards that will impact on coastal processes?

Appendix 2: Appraisal Matrices

Key to Appraisal				
Key to appraisal of Strategic Effects:			**Abbreviations:**	
Significance		**Category of effect**	**Timescale**	
++	Major Significant	Development actively encouraged as it would resolve an existing sustainability problem. Effect considered as being of national/ international significance.	**C**	Construction stage
+	Minor Significant	No Sustainability constraints and development acceptable. Effect considered of national/ international significance.	**O**	Operation stage
0	No significance	Neutral effect	**D**	Decommissioning stage
-	Minor Significant	Potential sustainability issues; mitigation and / or negotiation possible. Effect considered of national/ international significance.	**Likelihood**	
--	Major Significant	Problematical because of known sustainability issues; mitigation or negotiation difficult and/ or expensive. Effect considered of national/ international significance.	**H**	High Likelihood
?	Uncertainty	Where the significance of an effect is particularly uncertain, for example because insufficient information is available at the plan stage to fully appraise the effects of the development or the potential for successful mitigation, the significance category is qualified by the addition of '?'	**M**	Medium Likelihood
			L	Low Likelihood

Note: Separate appraisal matrices have been completed for each AoS objective under the Water Quality and Resources topic but the findings are presented in an aggregated appraisal under Water Quality and Resources in the site report.

Air Quality

AoS Objective:
12. To avoid adverse impacts on air quality
Guide questions:
Will it result in the release of low level radionuclides that may adversely affect human health or biodiversity?
Will it contribute to an increase in the number or expansion of AQMAs?

Potential Receptors:

- Local populations and wider regional population (human health)
- Sensitive habitats, including Severn Estuary SAC, SPA/RAMSAR and SSSI and Bridgwater Bay SSSI.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. The release of non-radioactive gaseous emissions during construction and operation is not likely to have a strategically significant effect, as effects from construction and operation will be localised (see regional/local appraisal below) and controlled through appropriate regulatory regimes and discharge consents.

2. However there is potential for release of radioactive emissions, planned and accidental, during the operation and decommissioning of a nuclear power station and waste storage on the site. This has potentially negative significant consequences for a wide demographic area, including the Bristol conurbation due to prevailing wind conditions. The potential effects of release of radiation are discussed in the main AoS report, however detailed modelling will be required and considered as part of the HSE and Environmental Regulators risk assessment as carried out for the consenting process.

3. There is a small risk that increased concentrations of airborne pollutants or nutrients could have an adverse effect on adjacent sites of nature conservation interest. Any accidental or planned release of radioactive emissions may also affect sensitive ecosystems. This is discussed further in the Biodiversity and Ecosystem Sections.

Air Quality

Regional/ Local

1. Air quality in the South West is generally good with low levels of sulphur, nitrogen dioxide and particulates in comparison with the rest of England. Whilst there are pockets of poor air quality in the region, no Air Quality Management Areas are located within the vicinity of the site, and the effect on air quality is not likely to be significant, provided construction and operation is in accordance with regulatory/consenting regimes.

2. As with any major infrastructure project, the emission of pollutants to the atmosphere associated with transport and the generation of fine particulates and dust during construction have the potential for local nuisance and impacts on health within a zone of influence from the construction site. Air pollution can be minimised and controlled through working in accordance with good site environmental practices and managed through the use of Construction Environmental Management Plans. This is discussed in further detail in Section 9 of the AoS report.

3. The release of radioactive emissions from the site will be governed by HSE and the environmental regulator through the development of appropriate discharge limits, as part of the authorisation under the Radioactive Substances Act 1993. This will be specific to the reactor type being used, alongside the siting and sensitivity of the receiving environment.

4. There is a small risk that increased concentrations of airborne pollutants or nutrients could have an adverse effect on adjacent sites of nature conservation interest. Any accidental or planned release of radioactive emissions may also affect sensitive ecosystems. This is discussed further in the Biodiversity and Ecosystem Sections.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	-	-?	-?
Likelihood	M	L	L

Significant Effects

- Release of non-radioactive emissions is unlikely to have a strategically significant effect on air quality.
- There is a small risk that increased concentrations of airborne pollutants or nutrients could have an adverse effect on adjacent sites of nature conservation interest.
- Release of radioactive emissions (planned and accidental) can have a significant strategic effect on air quality, including transboundary effects. The HSE and Environmental Regulator will consider this as part of the HSE and Environmental Regulators risk assessment carried out as part of the consenting process and must be satisfied risk to public health and safety is within acceptable limits.

Mitigation and Monitoring Possibilities

- Please refer to mitigation measures contained in the Biodiversity and Ecosystems Sections.
- Release of radioactive emissions controlled through regulatory process and risk assessment undertaken for consenting process.

Biodiversity and Ecosystems

AoS Objective:

1. To avoid adverse impacts on the integrity of wildlife sites of international and national importance.
2. To avoid adverse impacts on valuable ecological networks and ecosystem functionality.
3. To avoid adverse impacts on Priority Habitats and Species including European Protected Species.

Guide questions:

Will it result in the loss of habitats of international/national importance?
Will it affect other statutory or non-statutory wildlife sites?
Will it result in harm to internationally or nationally important or protected species?
Will it adversely affect the achievement of favourable conservation status for internationally and nationally important wildlife sites?
Will it affect the structure and function/ecosystem processes that are essential to restoring, securing and/or maintaining favourable condition of a feature or a site?
Will the proposal enable the BAP targets for maintenance, restoration and expansion to be met?
Will the proposal result in changes to coastal evolution that is otherwise needed to sustain coastal habitats?
Will it result in the release of harmful substances for example oil, fuel and other pollution into waterbodies which could affect aquatic ecosystems?
Will it result in the accidental migration of radionuclides which could harm aquatic or terrestrial ecosystems?
Will it result in changes to stream hydrology and morphology that could affect aquatic or terrestrial ecosystems?
Will it result in thermal discharges that could adversely affect aquatic ecosystems?
Will it result in soil contamination that could damage aquatic or terrestrial ecosystems?

Potential Receptors:

- There are a wide range of biodiversity interests surrounding the nominated site, including the nationally designated Bridgwater Bay Site of Special Scientific Interest (SSSI) and National Nature Reserve (NNR) which are adjacent to the nominated site. Further information on the European designated sites and their current condition is given in the separate HRA Report for Hinkley Point. The Hinkley Point site also borders the Severn Estuary, which is designated as a Special Protection Area (SPA) and Ramsar wetland site. It is also a Special Area of Conservation (SAC[1]). The Severn Estuary is protected for its intertidal mudflats, sandflat and saltmarsh habitats and its various bird and marine species.
- The River Wye SAC and River Usk SAC (including component SSSIs) are potential receptors due to their hydrological connections with the Severn Estuary.
- There are nine County Wildlife Sites (CWS) present within 3km of the nominated site. Protected species likely to be on, or within close proximity to, the

[1] At the time of issue of this report, the Severn Estuary has been accepted by the European Commission as a Site of Community Importance (SCI) but formal notices have not yet been issued. Given the imminent notification of the SAC the Severn Estuary SCI is referred to as SAC throughout this report.

Biodiversity and Ecosystems

nominated site include badgers, dormice, great crested newts, various bat species, water voles and otters.

- The land and shore to the east of Hinkley is used for high-tide and low-tide roosting areas by several bird species, including over-wintering bird species designated to the Severn Estuary SPA.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. Visual and noise disturbance effects during construction could have an adverse impact on the populations of wading birds and wildfowl associated with the Severn Estuary SAC/SPA/Ramsar site and SSSI components, and on the migratory fish species associated with the River Wye and River Usk SACs and their component SSSIs. Visual and noise disturbance could arise from general construction site activities, the increase in the number of workers on site, including at any temporary workers' accommodation on site, and their work adjacent to and within the designated sites, from the presence of construction plant and equipment, construction traffic, and site lighting. The Severn Estuary is of international importance for wintering and passage wading birds, with total winter populations averaging about 44,000 birds. Numbers can be considerably higher during severe winters, owing to its mild climate, the Severn supports wader populations that move in from the colder coasts of Britain. The Severn Estuary SSSI supports a high proportion of the estuary's internationally important Curlew *Numenius arquata* and Redshank *Tringa tetanus* populations, and a large percentage of its nationally important Ringed Plover *Charadrius hiaticula* and Grey Plover *Pluvialis squatarola* populations. Other waders which occur in significant numbers within the SSSI are Common Snipe *Gallinago gallinago*, Knot *Calidris canutus*, Whimbrel *Numenius phaeopus* and Turnstone *Arenaria interpres*. The SSSI is internationally important for Dunlin *Calidris alpina* and supports about 7.5% of the British wintering population of this species. The estuary as a whole supports about 10.5% of the British wintering population and is the single most important wintering ground of Dunlin in Britain. In late winter and early spring the SSSI supports nationally important numbers of Shelduck *Tadorna tadorna*, following the partial dispersal from their moulting grounds in Bridgwater Bay[2]. There is the potential for disturbance effects on important bird species utilising designated areas to be affected by construction of Hinkley Point which could result in the birds avoiding their preferred areas of for feeding or roosting, being displaced, and this may impact on their chances of survival. The nominator will need to assess the potential for disturbance effects from construction on birds in the designated areas and define measures to avoid or minimize such effects.

2. Direct loss and fragmentation of priority habitats, and habitats used by priority species, during construction, from earthworks and excavations, construction of new power station buildings and infrastructure, including new roads and potential railway lines, on terrestrial priority habitats (neutral grassland and species-rich hedgerows). The construction of cooling water culverts, a new sea wall, and a potential marine landing facility, may result in the encroachment of development onto the foreshore resulting in the loss of both marine (wave-cut platforms and sub-tidal habitat) and terrestrial habitats

[2] http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1001145
http://www.sssi.naturalengland.org.uk/Special/sssi/sssi_details.cfm?sssi_id=1002284

Biodiversity and Ecosystems

within the Severn Estuary SAC/SPA and Bridgwater Bay SSSI/NNR. Development of the nominated site, particularly those to develop a new sea wall, would encroach directly on the margins of the Severn Estuary SAC, SPA and Ramsar site creating coastal squeeze impacts. New transmission line towers may be proposed which traverse the Severn Estuary SPA and Bridgwater Bay SSSI and require loss of priority habitats for tower bases (neutral grassland) and clearance of hedgerows for the pylon corridor. The permanent presence of site buildings and infrastructure, including roads and lighting, will lead to longer-term loss, fragmentation and disturbance of habitats which could comprise severance of wildlife corridors, such as any commuting and foraging routes used by bats through the site. The potential for priority habitats and areas used by priority species to be retained within the nominated site, and new habitats to be created to mitigate for impacts, will need to be considered by the nominator in the site design and layout, routing of roads and transmission lines and other infrastructure, and measures defined in the nominator's proposals and EIA to avoid or minimise such losses. Priority species likely to occur at the Hinkley Point include, wintering, migratory and breeding birds, Great Crested Newts, bat species, Water Voles, Otter and potentially Dormice and Reptiles, for which further surveys would be required to determine a baseline for the prediction of the effects of developing Hinkley Point on these protected species in order to implement suitable mitigation measures. The nominated site is understood to be subject to an Integrated Land Management Plan as part of the British Energy estate, which includes ecological management and monitoring for a range of habitats and species, which is reported (BERR, 2008) to have led to biodiversity enhancements for local flora and fauna. A programme of longer-term mitigation measures for the development could be envisaged to be incorporated into the nominator's ILMP, and that such a mitigation strategy be required and secured through the wording of the Nuclear NPS and through the conditions of IPC consent.

3. The abstraction of water for cooling purposes can lead to incidental mortality of fish and other aquatic species. Fish, larvae and eggs can be sucked into condenser circuits and subject to heat before being returned to the sea[3]. The Severn Estuary, Bridgwater Bay areas and the Rivers Wye and Usk are designated for their internationally/nationally important migratory fish populations and the Severn Estuary and Bridgwater Bay for their large numbers of waders and wildfowl which may be particularly vulnerable to abstraction/discharge (see below) processes. Seven species of migratory fish move through the Estuary between the sea and rivers. There are large numbers of Atlantic Salmon *Salmo salar* and Common Eel *Anguilla anguilla*. The other species are Allis Shad, the nationally rare Twaite Shad *Alosa fallax*, the Sea Trout *Salmo trutta*, Sea Lamprey *Petromyzon marinus* and the Lampern or River Lamprey *Lampetra fluviatilis*. It should be noted that although BERR (2008) states that new technologies are designed to eliminate the above impacts, BE's EIA Scoping Report states that the potential to incorporate fish protection measures may be limited at the site. Water is currently abstracted from the estuary and bay for the existing Hinkley Point 'B' power station for its remaining operational lifetime, and the impact of the current abstraction is not known. Further studies will be required by the nominator to assess the effects on aquatic ecology from abstraction for Hinkley Point, especially in relation to migratory fish, and to identify a suitable intake/system design which avoids significant ecological effects within the SAC/SPA and component SSSIs.

4. Discharge of the heated water (up to 10°C warmer) used in the power station's cooling system into the Severn Estuary and Bridgwater Bay may result in changes to aquatic ecology in areas affected by higher temperatures, which may be negative, or positive for certain species. Discharges of heated water from a new power station would be released in addition to that from the existing Hinkley Point 'B' power station for its remaining operational lifetime, and the impact of the current discharge is not known. Further studies will be required to understand fully the extent and likely significance of effects on aquatic

[3] BERR (July 2008). Applying the Strategic Siting Assessment Criteria: a study of the potential environmental and sustainability effects.

Biodiversity and Ecosystems

ecology of proposals to discharge heated water, especially in relation to wading birds and migratory fish populations within the zone of influence from Hinkley Point.

5. Routine releases of radioactive discharges to water during operation, to the aquatic environment of the Severn Estuary and Bridgwater Bay, is envisaged as being, for all reactor designs being considered through the GDA process, within authorised limits that will be set by the relevant agency under the Radioactive Substances Act 1993. Aquatic discharges from a new power station would be released in addition to those currently discharged to the area under authorisation from the existing Hinkley Point 'B' power station for its remaining operational lifetime. Studies show that the combined effects of discharges from Hinkley B, Oldbury, Berkeley, and GE Healthcare in Cardiff is evident in the Bristol Channel, with apportionment difficult at the low levels detected. The Severn Estuary and its inter-tidal mudflats, sandflat and saltmarshes, is particularly vulnerable to contamination from toxic compounds, including through direct contact or accumulation of toxins and radionuclides via the food chain, in particular in migratory fish species which are the qualifying features of the SAC. Hinkley C is a known source of higher exposure in consumers of seafood due to liquid discharges. Further studies will be required to understand fully the extent and likely significance of effects on aquatic ecology of proposals for additional radioactive discharges from Hinkley Point.

6. There is a 'very small risk' of accidents or incidents at any nuclear power station site leading to unplanned release of radiation into the environment, during operation, including from interim radioactive waste storage, during decommissioning activities, and during transport of radioactive waste for final disposal. There is also the potential for accidental discharges of pollutants by leaks or spillages from the water treatment plants. Such releases could adversely affect terrestrial and aquatic flora and fauna associated with the Severn Estuary SAC/SPA/Ramsar site, its component SSSIs and Bridgwater Bay NNR and further afield, such is the diffuse and mobile nature of these ecosystems. Potentially this could lead to contamination of a wider area including important sites linked to the Severn Estuary and River Parrett such as the Somerset Levels and Huntspill River, Shapwick Heath and Westhay Moor. However, the operation of nuclear power stations, including waste storage, and decommissioning activities and the transport of radioactive waste, are subject to strict regulatory controls which aim to minimise such risks, and the likelihood of any effect is considered low. The designated sites and local ecological systems are currently subject to these risks from the existing Hinkley Point power stations 'A' and 'B'. Further studies are likely to be required to assess the risks and potential effects of the occurrence of such events on biodiversity.

7. The development of the Combwhich Wharf facility, on the River Parrett, may be required to transport heavy and abnormal loads during construction (BE, 2008). Should this be required, the potential effects of its development on an important migration route for eel and elver, and a small but significant salmon run in the River Parrett to spawning grounds on the River Tone, would be considered in the EIA. It may be possible to avoid effects through design or the timing of construction activities, but this potential impact requires further assessment of the nominator's proposals.

8. The Severn Estuary area is a focus for a number of potential high profile development projects involving both nuclear and renewable energy options, the cumulative effects of which are likely to be significant to the overall impacts on biodiversity for example site at Oldbury, and the Severn Tidal Power project.

Biodiversity and Ecosystems

Regional/ Local

9. Hinkley Point County Wildlife Site and its local network of hedgerows, woodland, grassland, arable fields and scrub, and locally important populations of breeding birds (including Nightingale), butterflies and other invertebrates, Badgers, and possibly reptiles, is likely to be subject to the direct loss of habitats, severance of wildlife corridors, and disturbance, as noted above. These losses may adversely affect ecological networks within the locality for mobile protected species reliant on wildlife corridors and wider connectivity within the landscape. As above, the site is understood to be subject to an Integrated Land Management Plan as part of the British Energy estate, which includes ecological management and monitoring for a range of habitats and species, which is reported to have led to biodiversity enhancements for local flora and fauna. It is envisaged that a programme of longer-term mitigation measures for the development could be incorporated into the nominator's proposals and managed through its current ILMP, and that such a mitigation strategy be required and secured through the wording of the Nuclear NPS and through the conditions of IPC consent.

10. The pollution of watercourses with sediment, oil, fuel, cement or other substances during construction, from general construction site activities, earthworks and excavations, site drainage works and use of vehicles, could affect habitats and species in the local network of rhynes, and local stream at site boundary leading to River Parrett.

11. Other impacts discussed above are also likely to be felt at a local level.

Summary of Significant Strategic Effects:

	C	O	D
Timescale			
Significance	-?	-?	-?
Likelihood	M	M	M

Significant Effects

- Visual and noise disturbance during construction to important bird populations associated with the Severn Estuary SAC/SPA/Ramsar site, component SSSIs and Bridgwater Bay NNR and to migratory fish populations associated with the River Wye SAC and River Usk SAC.

- Direct loss and fragmentation of priority terrestrial habitats including species-rich hedgerows and neutral grassland, including within the SPA/SSSIs, during construction of power station and associated infrastructure including transmission lines/towers. Direct

Mitigation and Monitoring Possibilities

- Minimise need for encroachment of construction into sensitive areas through site design.
- Construction environmental management plan to minimise disturbance, for example through timing, visual/noise screening.

- Avoid or minimise losses through site layout design.
- Habitat creation to replace lost habitats and

Biodiversity and Ecosystems	
loss of designated foreshore, inter-tidal and subtidal habitats within the Severn Estuary SAC/SPA/Ramsar/SSSIs to new sea wall, potential marine landing station, and cooling water culverts. Permanent habitat loss and severance of wildlife corridors through presence of buildings, roads, transmission lines and lighting.	maintain connectivity of wildlife corridors around site. • Ecological mitigation and management plan, to link to existing ILMP.
• The operation of a new nuclear power station also has implications for the designated fish species in particular the migratory shad species and Atlantic salmon (Severn SAC, River Usk SAC and River Wye SAC) through the impingement of fish on cooling water intake screens and the entrainment of eggs and larvae as part of the intake water cycle.	• Incorporation of fish protection measures within cooling water intake/system design. • Further studies necessary to determine impact.
• Impact of discharge of heated waters on aquatic ecology of Severn Estuary/Bridgwater Bay.	• Further studies necessary to determine impact.
• Routine discharges of radioactive liquids during operation, potential for accumulation in aquatic environment and harm to species.	• Avoidance through safe operation and decommissioning and waste storage and transfer. Further studies necessary to determine risks.
• Small risk of accidental discharges of radioactive materials to aquatic environment.	• Further studies necessary to determine impact, mitigate through design of facility and timing of works.
• Potential need to develop Combwhich Wharf, which may affect important migratory fish in Rivers Parrett and Tone.	• Avoid or minimise losses through site layout design. • Habitat creation to replace lost habitats and maintain connectivity of wildlife corridors around site. • Ecological mitigation and management plan, to link to existing ILMP.
• Direct loss of habitats at Hinkley Point County Wildlife Site, disturbance to locally important species, including Badger, and disturbance to ecological networks within wider locality.	• Further studies necessary to determine impact.
• Cumulative effects with other energy projects, including other nuclear power stations and Severn Tidal Power project.	

Climate Change

AoS Objective:
13. To minimise greenhouse gas emissions
Guide questions:
Will it result in increased vehicular emissions (particularly carbon dioxide)?
Will the development result in an overall reduction in greenhouse gas emissions over its life time ?

Potential Receptors:

- Human population and environment at all geographical scales.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. The effects of changes in greenhouse gas emissions as a result of the proposed development have national and international effects, particularly when combined with a wider nuclear programme. The benefits of the low carbon emissions from the operation of nuclear power stations are considered in the overarching AoS report. Emissions during the operational phase of the power station are significantly lower than that of any non-nuclear (conventional fossil fuel-powered) facility delivering equivalent power output.[4]

2. During the operational phase, the carbon footprint is similar to those of windpowered stations with equivalent output but with significantly less land or area coverage. This consideration is independent of any life-cycle (embodied) carbon emission analysis, which is currently outside the scope of this study.

3. This appraisal is independent of any life-cycle (embodied) carbon emission analysis, which is currently outside the scope of this study.

4. Although the effects of any emissions will be felt globally, the emissions during construction and decommissioning will largely be determined by regional and local factors, (for example local transport infrastructure and how the location of the site will affect transport emissions) .

Regional/ Local

5. The provision of a nuclear power station for energy generation at Hinkley Point will make a positive contribution to local targets to incorporate carbon reduction as a requirement of public sector investment decisions and procurement, when compared to some other sources of energy. The combination of nuclear power generation with increased investment in renewable energy sources will assist in reducing greenhouse gas emissions compared to no

[4] A White Paper on Nuclear Power: http://www.berr.gov.uk/files/file43006.pdf

Climate Change

nuclear power facility option in the region.

6. The activities involved in the construction of the plant are likely to have a negative impact on targets for reductions in carbon from transport and construction plant. The materials incorporated in the plant will also contribute to levels of embodied carbon in the region. The extent will depend upon the methods of transport and construction adopted and on the types and quantities of materials incorporated in the plant. There is potential for sea transport to be used for major items of plant and equipment . The indirect impacts associated with the construction phase could be higher in totality than the emissions of the construction activity itself. These include the influx of labour population, increased population vehicular usage, transport of materials, higher demand on utilities.

7. Other considerations include the possibility of the need to expand road or rail transport in order to accommodate the construction technical and upgrade demands in a rural setting. The net cross-cutting impacts of emissions on biodiversity, land, water, population and health should be considered- opportunities of applying better transport, material and application design aspects may seek to minimise these impacts.

8. Energy and climate change impacts from decommissioning the plant at the end of its life are not sensitive to the site location other than the distance that will be required to transport nuclear waste to any long-term waste geological depository facility. The means of disposing of nuclear waste, including spent fuel, from new nuclear power stations is being considered as part of the Government's programme for Managing Radioactive Waste Safely.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	-	++	-?
Likelihood	H	H	L

Significant Effects

- The reductions in greenhouse gas emissions due to the operation of nuclear power plants compared to alternative sources of energy will have positive long term effects during the operational stage and longer –term. The cumulative benefits of a nuclear program for climate change are further discussed in the main AoS report.
- Locating a nuclear power station on the site could have a positive multiplier effect on the further investment and implementation of other renewable (low carbon) energy sources in the region.
- Construction activity will produce an increase in greenhouse gas emissions, but will make only a relatively small addition to the regional inventory of emissions in comparison

Mitigation and Monitoring Possibilities

- The impacts during construction may be mitigated by selection of carbon-efficient

Climate Change	
to the low carbon energy output of the station. This is discusssed in the main AoS Report. • The operational phase of the power station is likely to have far less carbon footprint compared to those of fossil-fuel powered stations providing similar power output.	forms of transport and construction. There is also the possibility of offsetting the emissions. • The greenhouse gas emissions arising from construction and operation should be monitored to inform carbon reduction through the lifetime of the project.

Communities: Population, Employment and Viability
AoS Objective: 4. To create employment opportunities. 5. to encourage the development of sustainable communities 10. To avoid adverse impacts on property and land values and avoid planning blight **Guide questions:** Will it create both temporary and permanent jobs in areas of need? Will it result in in-migration of population? Will it result in out-migration of population? Will it affect the population dynamics of nearby communities (age-structure)? Will it result in a decrease in property and land values as a result of a change in perceptions or blight?
Potential Receptors:
• Local and regional resident workforce • Local and regional population
Potential Significant Effects and Mitigation Possibilities:
International/ National/ Transboundary No significant effects identified at this scale.

Communities: Population, Employment and Viability

Regional/ Local

1. Short-medium term positive effects through creating new jobs for local, regional population. The quality and quantity of employment during the construction stages (approx 5-6 years) of the reactor will differ to the operational stage (approx 60 years), where longer-term employment will lead to quality of life benefits. Labour requirements will tail-off towards the end of the operational stage, however decommissioning will still require significant levels of labour for a min of 30 years. The significance of the effect is greater at the local level, whereas at the regional level this is of minor significance, as jobs are absorbed into regional employment figures.

2. The existing reactor at the site is a significant local employer, employing approximately 600 employees (535 full-time, 150 from contract partners[5]). A new power station may assist in offsetting job-losses from the decommissioning of the existing power station at the site - however it is noted the time difference between decommissioning and construction of any new reactor will likely require employees to seek employment elsewhere..

3. Positive effects through the provision of training, education and upskilling for employees and contractors in the region.

4. Positive multiplier effects (for both nuclear-related industry and wider industry as a result of increased demand from an incoming population). Of greater significance at the local level, but may be positive cumulative effect at regional level when considered with other low carbon energy proposals (for example Oldbury Nuclear Power Station, Severn Tidal Barrage).

5. Some uncertainty is identified as the construction may affect the ability of other industries/projects to source labour, for example for house-building in region.

6. Likely changes to the population dynamics of local communities- with potential positive and negative effects. Effects dependent on source of labour, for example from local community or outside. Possible negative effects during construction stage as a temporary new community (construction labour) may not integrate with existing community. Longer term, new employees likely to be drawn from a wide area, including local communities and the wider area, with less pressure on local services. Positive economic and social benefits likely as new population will require new services and facilities and will help to support existing services.

7. Potential for adverse effects on property values within close proximity to the site. Mitigation possible. No evidence to suggest significant effects beyond immediate site surrounds.

[5] British Energy presentation. April 2008. http://british-energy.com/pagetemplate.php?pid=449

Communities: Population, Employment and Viability

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	+?	+?	0
Likelihood	H	H	M

Significant Effects

- Strategic effects are considered minor, although some uncertainty identified as project may lead to a shortage of local construction workers to meet the needs of other industries.
- Positive cumulative effects are also likely for the region when considered with proposals for a second nuclear power station and Severn Barrage in the South West- contributing to the regional economy and employment.

Mitigation and Monitoring Possibilities

- Consideration may need to be given to potential negative effects/difficulties in sourcing labour and the effects of this on the local/regional house-building industry.

Communities: Supporting infrastructure

AoS Objective:
8. to avoid adverse impacts on the function and efficiency of the strategic transport infrastructure
9. to avoid disruption to basic services and infrastructure

Guide questions:
Will it result in changes to services and service capacity in population centres?
Will it result in the direct loss of strategic road/rail/air/port infrastructure?
Will it result in increased congestion/pressure on key transport infrastructure?
Will it result in loss or disruption to basic services and infrastructure (for example. electricity, gas)?
Will it place significant pressure on local/regional waste management facilities (non-nuclear waste)?

Potential Receptors:

- Local and regional population
- Existing transportation and service infrastructure
- Existing waste management infrastructure

Communities: Supporting infrastructure
Potential Significant Effects and Mitigation Possibilities:
International/ National/ Transboundary 1. Potential for negative effects on national transport network through further congestion to M5 motorway during construction, operation and decommissioning stages. The motorway is 12 km east of the site, with junctions 23 and 24 linking to the A38 north and south of Bridgwater. The M5 around Bridgwater currently experiences between 0-90% observed daily stress. This is anticipated to rise to 90-100% daily stress by 2016 for links to the north of Junction 23 and to the south of Junction 24. By 2026, forecast daily stress for links between Junction 23 and Junction 24 rise to 100-110%, whilst those links to the north of Junction 23 and to the south of Junction 24 rise to 110-130%. [6] 2. Further information is required to determine the effect on the M5, including details on construction workforce, timeframes and volume of materials to be transported. However, the capacity of the M5 and Junctions 23 and 24 is likely come under extra strain during the lifetime of this project due to future developments planned for both the north and south of Bridgwater. 3. Mitigation measures can be implemented to minimise effects on the M5 Motorway through appropriate planning. This may include physical improvements, carrying of large loads outside of peak period, construction transport management plans, and green travel plans for the construction and operational workforces to encourage sustainable travel. 4. Port and rail should also be considered as alternative options, particularly for the transport of construction materials. This may have impacts on existing freight movements in the Severn Estuary, although such effects can be mitigated through appropriate planning and management plans. 5. Impacts of the transportation of Nuclear Waste are unknown the location of a long-term waste geological depository facility is known. This is being considered as part of the Government's programme for Managing Radioactive Waste Safely. 6. Impacts of the storage and disposal of nuclear waste are dealt with in the main AoS Report.
Regional/ Local 7. Negative effects identified for transportation network. Nature and significance of effects depend on mode of transport, and further details on construction

[6] Highways Agency (2008). Regional Network Report for South West

Communities: Supporting infrastructure

workforce, timeframes and volume of materials to be transported.

8. Access by road is limited and key roads providing current access to Hinkley Point (the M5, A38 and A39) already suffer peak period and seasonal (summer) congestion.[7]
9. Negative transportation effects likely for local towns, for example Cannington and Bridgwater, however further transportation studies are required to determine appropriate mitigation measures, including any physical improvements to the road network.
10. Access to the rail network may be available from Bridgwater, approximately 16km from the site and on the Bristol to Taunton line. However, further transport to Hinkley Point would still require transport on local roads A39 and C182. The use of shuttle buses operating between Bridgwater station and Hinkley point could alleviate some pressure on the local road network.
11. The existing port access at Combwich on River Parrett may be utilised for loading/unloading, though further road transport (Private Road and local road C182) would still be required. There is also the possibility of bringing large shipments in via a temporary wharf facility which could be constructed at the site itself.
12. Non-nuclear construction waste will need to be further considered once details are available, including the volume and type of waste likely to be produced and transportation routes- however effects are unlikely to be significant. The preparation of a construction waste management plan will assist in minimising impacts on existing waste facilities.
13. Operational waste (non-nuclear) will have impacts upon the capacity of existing waste management services, however it may be possible to extend arrangements for the existing nuclear facility and the implementation of an operational waste management plan would help to minimise any impacts.
14. Any influx of a new temporary workforce will place pressure on existing infrastructure, social and community services, as will increased population in local towns and villages in the longer term. This may require augmentation of existing services (including electricity and wastewater infrastructure) to cope with demand, however is not considered to have a significant effect. Further details regarding the sourcing of the workforce will be required to consider this at the detailed planning stage.
15. The construction and operation of a nuclear power station at the site is likely to require additional services/ connection to existing services (including electric, water and wastewater), however the location of an existing plant at the site will limit the amount of new infrastructure required. This is not considered to be a significant effect.
16. The development of a nuclear power station at Hinkley Point may require new power lines to be built, or existing lines to be upgraded, to connect the facility with the National Grid. The potential impact of new or upgraded power lines will be considered in a separate Networks National Policy Statement (NPS), due to be published by the Government in October 2009.

[7] British Energy (2008). Proposed Nuclear Development at Hinkley Point. Environmental Scoping Report

Communities: Supporting infrastructure

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	- ?	- ?	- ?
Likelihood	M	M	M

Significant Effects

- Potential for significant effects on national road infrastructure through increased congestion/ disruption of traffic on the M5 motorway and at junctions 23 and 24 linking to the A38. In isolation, this is not considered likely to be significant; however the cumulative effect of development in the region, including planned development at Bridgwater, may lead to increased congestion during construction, operation and decommissioning stages.
- Potential for effects on strategic road network through carrying of large loads during construction-however this can be mitigated.

Mitigation and Monitoring Possibilities

- Further studies will be required to assess in detail the effects on the road network, including the M5 Motorway.
- Appropriate mitigation measure to reduce the effects of transportation could include a Transport Management Plan (construction and decommissioning) and Green Travel Plan (construction, operation and decommissioning). Consideration of alternatives to road for the transport of large loads (for example transport by sea).

Human Health and Well-being

AoS Objective:
6. To avoid adverse impacts on physical health
7. To avoid adverse impacts on mental health

Guide questions:
Could the health of local communities be affected by any routine or accidental radioactive discharges that would increase exposure to radiation, during operation, decommissioning and interim storage of radioactive waste on the site.
Could any noise and vibration from site, for example as a result of construction or operational activities lead to physical and mental health impacts on nearby communities?
Are there different vulnerable communities locally that could be affected?

Human Health and Well-being

Could it help to reduce any health inequalities?
Could any local perceptions of adverse risk as a result of the development and operation of the power station at site lead to adverse impacts on mental health for nearby communities?
Could it adversely affect the ability of an individual to enjoy and pursue a healthy lifestyle?

Potential Receptors:

- Hinkley Point workforce (temporary, contract and full-time workforce) during construction, operation, decommissioning
- Hinkley Point workforce (potentially) living on site
- Local resident population, visiting tourists and recreational users.
- Regional Population

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. National and transboundary health risks: There is a potential for any radioactive material discharged from the proposed site to travel both nationally and internationally. However, the risk is considered low. Current radiological monitoring of the nuclear power station that has been on the site since 1962 (see Appendix 4), suggests that the risk to the public is extremely low with total dosage from all sources (including direct radiation) currently (2007) estimated as approximately 7% of the limit specified in the Ionising Radiations Regulations 1999. With regard to transboundary effects, there is a requirement under Article 37 of the Euratom Treaty for the United Kingdom, before plant authorisation can be granted, to submit its assessment of the likely effects to a panel of European experts who decide whether contamination of the water, soil or airspace of another Member State is likely to take place.

2. Cumulative effects: The cumulative effect of this discharge and a number of others being considered has the potential to increase radiation doses to the UK population to a more significant level than that currently observed. This will need to be taken into account when planning all future power plants in terms of their size, design, position and allowed emissions and discharges.

Regional/ Local

3. Health impacts from routine discharges: The strict regulatory framework, to restrict both routine discharges from nuclear power stations and direct radiation exposures to workers and the general public, should reduce potential health impacts to acceptable levels and ensure that radiation doses are well within

Human Health and Well-being

internationally agreed limits. The relevant regulators, by means of a statutory authorisation procedure, will require the operators of nuclear plants to ensure that the exposure of workers and the public to radioactivity from nuclear sites is kept below stringent legal limits which are as low as is reasonable achievable. This system of regulation should ensure that the permitted discharges from the proposed nuclear power station at Hinkley Point do not cause unacceptable risk to health.

4. Other health impacts: It is possible that the proposed power station will require additional electricity transmission lines to link its output to the national grid system. Given the current uncertainty regarding the health effects of prolonged low level exposure to electromagnetic fields (EMFs) it is recommended that, in keeping with Health Protection Agency advice[8], a precautionary approach be adopted to the routing of any required power lines. In addition, it would be prudent to undertake a project level health impact assessment to evaluate this potential effect together with those which may be associated with routine plant emissions and transport-related air pollution and noise.

5. Risk of accident - unplanned release of radiation: During the operation of the nuclear power station, there is a risk of unplanned release of radiation into the environment leading to adverse health impacts. However, the risk of such an accident is very small because of the strict regulatory regime in the UK (referred to above) and the generic design assessment being carried out by the Health and Safety Executive (HSE). This assessment, and the Executive's input into the nuclear site licensing regime, is designed to ensure that several levels of protection and defence are provided against significant faults or failures, accident management and emergency preparedness strategies are prepared and that all reasonably practicable steps have been taken to minimise the radiological consequences of an accident.

6. Risk of accident - transport of nuclear material: The transportation of nuclear materials to and from the site increases the possibility of an accident with radiological consequences. However, the safety record for the transport of nuclear material suggests that the risks are very low. Data from the Radioactive Materials Transport Event Database (RAMTED) for the period 1958 to 2006 showed that of the recorded 850 events associated with the transport of radioactive materials no 'significant dose events' were associated with the nuclear power industry. Rather all nineteen recorded significant dose events involved the transport of industrial radiography sources that were moved without the source being properly returned to the container.

7. Disease clusters: In the past, there has been a lot of publicity about clusters of cancerous diseases, particularly childhood leukaemias, around nuclear power station sites. This subject was researched in 2005 by COMARE (Committee on Medical Aspects of Radiation in the Environment) when they looked at the incidences of childhood leukaemia, non-Hodgkin lymphoma and other malignant tumours around the UK nuclear power station sites, including Hinkley Point. This study found that the expected number of cases of both childhood leukaemia, non-Hodgkin lymphoma and other malignant tumours were no more than would be expected for a typical area with similar population in Britain as a whole.

8. Health services: The influx of workers required for the construction phase of the proposed new power station may put a strain on local health services as

[8] http://www.hpa.org.uk/web/HPAweb&HPAwebStandard/HPAweb_C/1195733817602

Human Health and Well-being

may, though to a lesser extent, the station operational staff. Given this situation, it would be prudent to review the need for appropriate additional health service capacity during the planning process.

9. Health and safety issues: The work associated with the construction and operation of a nuclear power plant at Hinkley Point brings with it the possibility of health and safety incidents. However, nuclear power stations are highly regulated in this regard and must not only comply with the requirements of the Health and Safety at Work Act 1974 but also with the requirements of the Nuclear Installations Act 1965 and the Ionising Radiations Regulations 1999. This means that the potential operator must have a licence from the Nuclear Installations Inspectorate (NII) before construction can begin. Such a licence will only be granted if the NII is satisfied that the power station can be built, operated and decommissioned safely with risks being kept to 'as low as reasonably practicable' (ALARP) at all times. The licence will, therefore, have conditions attached to it which will allow NII to control safety risks throughout the lifetime of the project.

10. Perception of risk: It is possible that the perception of risk associated with living or working near to a nuclear power plant could adversely affect the health and well-being of relevant individuals. However, there is little literature available on this potential impact which suggests that it has not been a significant problem in the past. In any event, in the case of the site, people living and working nearby have had a long time to get used to there being an adjacent nuclear plant so this is unlikely to be a significant problem at this location.

11. Recreation: With regard to recreation, there is a potential impact associated with the coastal path which passes the site. It is likely that this path may need to be closed during some phases of power station construction but this effect will be temporary and can readily be mitigated by providing a bypass path around the site.

12. Community well-being: West Somerset is a reasonably deprived area, with education deprivation and barriers to housing and services being greater than the English average. The siting of a new nuclear power station at Hinkley Point should help to alleviate these deprivations somewhat as more jobs will be created in the area leading to an increase in community wealth, additional housing and other associated neighbourhood infrastructure.

13. Community disturbance: The presence of, and more particularly the construction of, a nuclear power station at the site is certain to increase community disturbance to some degree when compared to the current situation. Potential disturbances in the construction phase include noise and vibration, dust and increased traffic although these effects would be temporary. There is also likely to be some disturbance associated with increased traffic during the operational and decommissioning phases of the power station. These effects should be considered, and mitigated if necessary, during the planning stage of the power station project by considering the adoption of an environmental management plan for the construction phase and an appropriate transport plan for all project phases.

Human Health and Well-being

14. Employment: Whilst employment levels in West Somerset are approximately equivalent to the rest of England, there are still people seeking work in this area and the region in general. As has been demonstrated[9], being in work can contribute to individual healthiness and, more particularly, being unemployed can be harmful to health in both a mental and physical sense. The development of a new nuclear power station at Hinkley Point can thus be expected to improve the general mental and physical health and well-being of the area's population by providing more short term (construction and decommissioning phases) and long term (operational phase) work opportunities.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	+	+	+
Likelihood	M	M	M

Significant Effects

- The possibility that the cumulative effects of all future nuclear plants will increase radiation doses to the UK population, and possibly citizens of other countries
- The possibility of local and regional health risks from the likely permitted discharges from the proposed new Hinkley Point power station
- The potential for electromagnetic fields generated by any required additional power lines to cause adverse health effects in the local and regional population
- The potential requirement for appropriate additional health service capacity for the influx of both construction and operational workers
- The construction and operation of the proposed nuclear power station may lead to unacceptable community disturbance
- It is likely that the presence of a new nuclear power station at Hinkley Point will lead to an increase in employment, community wealth, additional housing and other associated neighbourhood infrastructure – these positive effects are likely to be much more significant than any potential negative consequences assuming any effects on population health are not realised

Mitigation and Monitoring Possibilities

- Ensure potential cumulative effects are calculated and assessed when planning and consenting all future nuclear power plants
- Undertake a health impact assessment to predict the effects of the power station discharges on the local and regional population
- Carry out a review of local health provision to ensure it is adequate for the expected influx of power station workers
- Ensure a construction environmental management plan and an all-phase travel plan are produced, observed and monitored
- Ensure sufficient monitoring of power station discharges and effects on local health is undertaken throughout the operational and decommissioning phases of the project

[9] Waddell G and Burton K (2006): 'Is work good for your health and well-being?', TSO, London

Cultural heritage

AoS Objective:
22. To avoid adverse impacts on the internationally and nationally important features of the historic environment.
23. To avoid adverse impacts on the setting and quality of built heritage, archaeology and historic landscapes
Guide questions:
Will it adversely affect historic sites of international/national importance and their setting?
Will it adversely affect other historic sites of known value?
Will it adversely affect landscapes of historic importance?

Potential Receptors:

- Built heritage, archaeology and historic landscapes of local to international importance.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. Wick Barrow Pixies' Mound Scheduled Ancient Monument (EH NMR 191177, SHER 34063) is located immediately adjacent (<100m) to the existing site, to the south. It is known that this SAM lies within an area of Roman settlement. Although previously excavated (in 1907) this SAM would be directly affected by any construction works. Although the designated site itself could be retained, i.e. incorporated within the new development, the setting of the SAM would be permanently lost.

Regional/ Local

2. Approximately 100m to the west of Pixies' Mound is St Sidwell's Well[10] a medieval holy well. Previously excavated in 1908, finds included flint, Iron Age, Roman, Medieval and 17th/18th century pottery. English Heritage (EH) also records various finds, including 4th century pottery and imitation Samian, found in a rubbish pit near the north end of the approach road to the existing power station[11]. To the east of the existing power station is Wick Manor enclosure[12], an undated enclosure visible as an earthwork. The presence of these features indicates historic activity, spanning a long period of time, in the area immediately surrounding the existing facility, including immediately offshore. As such the area is likely to be considered of high archaeological importance. As a minimum, an archaeological watching brief will be required during construction, however, it is also likely that a detailed archaeological

[10] English Heritage (EH) National Monument Register (NMR) 191182, Somerset Historic Environment Records (SHER) 34064
[11] Period: Roman. EH NMR 191186, SHER 34065
[12] EH NMR 982137, SHER 34654

Cultural heritage

investigation of the area will be required at the detailed planning application, including intrusive investigation (for example. trial trenching).

3. No impacts are likely during operation unless further works are undertaken that involve excavation, however, the setting of the features, in particular Pixies' Mound, will be compromised (no mitigation possible).

4. Impacts to buried archaeological resource are possible during decommissioning as excavations are likely to be required, in addition to damage to the surface of the features where visible, for example Pixies' Mound, Wick Manor Enclosure. Reinstatement of the area following decommissioning is unlikely to mitigate for earlier impacts.

5. The remains of a submarine forest and peat deposits are also recorded as being located on the beach to the north east of the existing power station site[13]. In addition, EH also record that a walkover survey to assess the archaeological and palaeoenvironmental potential of the zone identified 77 sites[14]. However, as this area is offshore, no impacts on this feature are likely, although consideration will be required for any offshore abstraction / discharge pipelines.

6. Between 2-5km from the site, the Somerset Historic Environment Records (SHER) and English Heritage (EH) list a further 49 and 31 records respectively (of which 14 records are duplicated). Includes records of 14 Grade II listed buildings, Roman finds, deserted farms, lime kilns, WWII pill boxes, plus records of previous studies / investigations. No direct impacts to these sites, or other sites within the ward are likely. Impacts to their setting may arise during construction should construction traffic be routed nearby, although this can be avoided.

7. Fairfield House (Park and Garden) is located >3km to SE at Stington (Grade II Historic Landscape Register 34060). The grounds contain a deer park. The setting of this park may be slightly impacted, particularly if there are views to/from the NE.

8. Within 10km of Hinkley Point, the EH and SHER databases list a combined total of approximately 430 records.Within the West Somerset area there are 10 conservation areas. These are in Minehead (Quay Street, Higher Town, Wellington Square and Woodcombe), Alcombe Village, Holford, Old Cleeve, Stogumber, Stogursey and Watchet. Of these Minehead, Stogursey and Watchet are identified as Outstanding Heritage Settlements, no impacts considered likely.

[13] EH NMR 975506, SHER 34078
[14] EH NMR 1322047

Cultural heritage

Summary of Significant Strategic Effects:

	C	O	D
Timescale			
Significance	-	-	-
Likelihood	M	M	M

Significant Effects

- Wick Barrow Pixies' Mound Scheduled Ancient Monument is located immediately adjacent (<100m) to the existing site, to the south, lying within an area of Roman settlement. Although previously excavated (in 1907) this SAM would be directly affected by any construction works. Although the designated site itself could be retained, i.e. incorporated within the new development, the setting of the SAM would be permanently lost.
- Bronze Age and Roman activity is evident within the surrounding (immediate) area with the existing facility. Although the designated/known sites can be avoided, unknown archaeological (buried) resource is potentially present.

Mitigation and Monitoring Possibilities

- The setting of the Wick Barrow Pixies' Mound Scheduled Ancient Monument, even if retained and incorporated within the development, will be permanently lost. No mitigation is possible for this impact.
- Further detailed investigations (field evaluation, trial trenching etc.) may be required prior to construction, with a watching brief required during the construction phase (during ground preparation and excavations).

Landscape

AoS Objective:
24. To avoid adverse impacts on Nationally important landscapes.
25. to avoid adverse impacts on landscape character, quality and tranquillity, diversity and distinctiveness.
Guide questions:
Will it adversely affect landscapes within or immediately adjacent to a National Park?
Will it adversely affect landscapes in or immediately adjacent to an AONB or NSA?
Will it adversely affect Heritage Coast or Preferred Conservation Zones?
Will it adversely affect local landscapes/townscapes of value?
Will it affect the levels of tranquillity in an area?
Will it adversely affect the landscape character or distinctiveness?
Will it result in increased levels of light pollution?

Landscape

Potential Receptors:

- The Quantocks Area of Outstanding Natural Beauty 4km to the west.
- Distinctive site landscape features within The Quantock Vale Landscape Type ,
- The landscape character of neighbouring local landscape character areas including The levels and Moors, the Lowland Hills and the Doniford Stream and Quantock Fringe . The visual amenity of local residents, surrounding recreational areas, walkers on public footpaths and trails, local road and rail users.
- Visual receptors within the Quantock Hills Area of Outstanding Natural Beauty.
- The Wentlooge area of the Gwent Levels Landscape of Historic Interest lies approximately 30km from the nominated site and the Glamorgan Heritage Coast is 25km from the nominated site across the Bristol Channe

Note: Refer to the Cultural Heritage assessment for consideration of the effects of the development on scheduled ancient monuments, listed buildings, the Historic Park and Garden (Fairfield) and the Stogursey Conservation Area that fall within 5 km from the site.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. As the Welsh Coast is visible from the Hinkley Point, it is likely that Hinkley Point itself will be visible from Wales, across the Bristol Channel. However, these impacts are likely to be insignificant given the distance involved and the nature of change in the views experienced.

2. Also some 15 km west on high ground covering the western section of West Somerset as well as parts of Devon, is Exmoor National Park. The Exmoor Heritage Coast is part of, and managed within, the National Park. Neither the National Park nor the Heritage Coast will be significantly affected by the proposed development at Hinkley Point given the topography and distance involved.

3. The Mendips AONB is also located to the east on elevated land at 14 km distance Although there could be expected to be some views to the power station from here, no significant visual impacts are considered likely, given the distance involved. However, this conclusion would need to be verified following a detailed visual assessment at the EIA stage.

4. Located within 5 km of the site to the west and south west is the Quantock Hills AONB. This covers 99 km^2 running north west from the vale of Taunton Deane to the Bristol Channel Coast. The Quantock Hills was England's first AONB being designated in 1956 (confirmed in 1957) and consists of large amounts of heathland, oak woodlands, ancient parklands and agricultural land. It is a historic, man-made landscape, with the activities of the people living and working on and around the Quantock Hills influencing the landscape for the past 4000 years, resulting is a rich and diverse historic landscape. Although not directly affected, the wider setting of this area is likely to be effected in some views across to new power station buildings (seen in the context

Landscape

of existing buildings) and new transmission lines. Views of Hinkley Point are likely from certain locations within the designated area of the AONB, over the long term.

Regional/ Local

5. A short distance to the east of the site is JCA 142/3: Somerset Levels and Moors/Somerset Hills, and to the south west is JCA 144: Quantock Hills. These areas are further characterised in the the Sedgemoor Landscape Assessment and Countryside Design Summary (September 1997) by specific landscape types including the Lowland Hills and the levels and Moors. The Quantock Hills are further characterised in the West Somerset District Council Landscape Assessment where the Doniford Stream and Quantock Fringe is a relevant adjacent landscape type. Although these landscapes will not be directly affected, Hinkley Point is likely to be visible and have some visual and indirect landscape impact on these areas.

6. The site itself is not located in a designated landscape. It is located just within Joint Character Area (JCA) 146: Vale of Taunton and Quantock Fringes. This assessment identifies parts of the coastline as being 'remote and rather bleak', but with fine, long-distant views to the Welsh Coast from higher ground inland. The existing Power Station is identified as being a prominent (and dominant) visual feature, and the assessment concludes that expansion could magnify this effect. In addition, there are likely to be direct adverse impacts on lanscape character and views in this area and indirect effects on surrounding area, potentially arising from the addition of associated new grid connectivity infrastructure.

7. Given the likely scale of any new development, it will not be possible to mitigate for all the landscape and visual impacts over a long timescale, either immediately surrounding the site or from the higher ground of the Quantock Hills, from which the site is visible. In addition, new development although being seen in the context of the existing facility will add to the landscape and visual impacts of the existing Power Station, which is already a prominent feature along the coast.

8. Hinkley Point itself is specifically identified as falling within the Quantock Vale Landscape Type defined in West Somerset District Council Landscape Assessment LUC 1999. There would potentially be direct adverse landscape and visual impacts resulting in removal or effects upon of some existing hedgerows, woodland copses, individual trees, the rock wave cut platform, pasture fields, resulting from the creation of construction compound areas, new power station buildings, new pylons, ancilliary facilities, the new sea defence wall, marine landing platform and water cooling culverts. The visual effects of construction and the operational scheme on neighbouring residents including effects associated with lighting and traffic may also be significant.

9. Mitigation potential includes: Protection measures allowing for the conservation of existing vegetation and rhynes in the temporary construction laydown area, avoidance of temporary laydown areas on the foreshore. Siting of new power station building and ancilliary facilities in close proximity to one another and the existing power station buildings to avoid a significant broadening of visual impact. Construction of a sea defence wall in a position that avoids direct impact on the wave cut rock platform and is built in a form that respects local distinctiveness and materials. Sensitive design and or alignment of the water cooling facility (preferably through the use of tunnelling techniques) to avoid adverse impact of the wave cut platform, provision of buffer zones between construction areas and adjoining residential areas, delivery of construction materials by sea to reduce road use and the use of strict cut offs on lighting and

Landscape

restricted working hours to limit light pollution. Key positive opportunities include landscape restoration and off set enhancement measures, including tree planting, grassland and hedgerow restoration to the decommissioned site, the temporary construction areas and the surrounding landscape within the Estate.

10. With this potential site design and mitigation in place, local site impacts could be reduced to a slight adverse to neutral level after decommissioning, however, there are still likely to be some localised long term adverse effects.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	-	-	0?
Likelihood	H	H	H

Significant Effects

- During construction and operation the main direct impacts would be at local level. However, there are likely to be some long lasting adverse indirect landscape and visual impacts on the surrounding area including parts of the Quantock Area of Outstanding Natural Beauty, with limited potential for mitigation. The existing power station is already a prominent feature from local viewpoints and is visible from some long-distance viewpoints, including parts of the high ground inland (for example. the Quantock Hills). The new power station will be seen in the context of the existing facilities before decommissioning. However, further development is highly likely to lead to a perceptible deterioration in some views, which would not be able to be mitigated, given the scale of new buildings.
- The decommissioning of the facilities may allow some landscape restoration of previously developed areas in the long term, however, long term land uses for the restored areas is difficult to predict.

Mitigation and Monitoring Possibilities

- Given the scale of the likely development, fully effective mitigation during the construction and operational phases of adverse effects on the setting and views from surrounding hills including parts of the Quantocks AONB is unlikely.
- Mitigation possibilities are likely to be limited to clustering proposed reactor building close to exiting building to avoid broadening visual impact and otherwise consideration should be given to the material finishes of the reactors.
- When Hinkley A and B are decommissioned there would be opportunities to restore the land and potentially remove reactors. However, this landscape restoration could occur with or without the implementation of the power station on the site

Soils, Geology and Land use

AoS Objective:
19. to avoid damage to geological resources
20. to avoid the use of greenfield land and encourage the re-use of brownfield sites
21. to avoid the contamination of soils and adverse impacts on soil functions

Guide questions:
Will it result in the compaction and erosion of soils?
Will it lead to the removal or alteration of soil structure and function?
Will it lead to the contamination of soils which would affect biodiversity and human health?
Will it compromise the future extraction/ use of geological/ mineral reserves?
Will it result in the loss of agricultural land?
Will it lead to damage to geological SSSIs and other geological sites?
Will it result in the loss of Greenfield land?
Will it adversely affect land under land management agreements?

Potential Receptors:

The site lies within a region of agricultural land use. No significant geological designated site lies within the local vicinity.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. The site potentially lies within the Seven Estuary SPA, SAC and Bridgwater Bay SSSI. Construction activities and operational activities are likely to have a detrimental effect to the short/medium term soil quality within the area of the proposed development. Compaction/removal of soils is likely to affect the soil quality within these designated sites, which may also affect biodiversity; however this is addressed in the appraisal of Biodiversity.

2. There are no geological designations of note within the local vicinity. Mineral abstraction is not considered an issue at the site.

3. The loss of Greenfield land is not considered to be significant on a National level.

Regional/ Local

4. The area adjacent to the site lies within a region classified to be of High Fertility by the National Soils Resources Institute. Any development is likely to have a local effect on agricultural land use. The soils could potentially be returned to an equivalent agricultural grade but reinstating the original soils matrix is

Soils, Geology and Land use

unlikely. The extent of the loss of agricultural land is unlikely to be significant in a national context. Soils could be returned to a similar agricultural importance once the site has been decommissioned however the original soils matrix is unlikely to be restored.

5. Construction of new plant upon Greenfield sites. The loss of Greenfield land is likely to be of local significance.

6. Radioactive contamination of soils is not covered as part of this assessment but is covered by the additional research being undertaken as part of the wider radioactive waste issue. The site would fall within National Permitting requirements and therefore management of the site in order to prevent the contamination of soils would be covered by these legislative requirements. Contamination and effects to Human Health would also be covered by this investigation.

7. There are a number of Landfills identified within the locality of Hinkley Point. These are likely to be of minor significance as any disturbance/assessment would need to be addressed with the relevant regulator. Detailed assessments will be undertaken as part of the site specific EIA.

Summary of Significant Strategic Effects:

Timescale	C	O	D
Significance	-?	- ?	-?
Likelihood	M	M	M

Significant Effects

- The construction of the power station and associated infrastructure (including transmission lines/towers) will lead to the direct loss of soil structure. This may include impacts on soils that maintain terrestrial habitats, including designated nature conservation sites; the Severn Estuary SPA/ SAC and the Bridgwater Bay SSSI and NNR. . This is considered further in the biodiversity appraisal.

Mitigation and Monitoring Possibilities

- Limitation of the footprint of the development reducing the area of soils affected. Avoidance of any soils within designated sites of ecological importance.

Water: Hydrology and Geomorphology

AoS Objective:
15. To avoid adverse impacts on surface water hydrology and channel geomorphology (including coastal geomorphology)
Guide questions:
Will it result in the increased sedimentation of watercourses?
Will it adversely affect channel geomorphology?
Will hydrology and flow regimes be adversely affected by water abstraction?
Will it result in demand for higher defence standards that will impact on coastal processes?
Can the higher defence standards be achieved without compromising habitat quality and sediment transport?

Potential Receptors:

Local and district resident population and tourists, local and district ecosystems in coastal and estuarial waters and on the foreshore.

Potential Significant Effects and Mitigation Possibilities:

International/National/Transboundary

The potential effects on surface water hydrology and fluvial and coastal geomorphology are likely to be limited to the Severn Estuary and the coastline within approximately 10-20km of the site. It will be necessary, however, to undertake a data collection and modelling exercise to confirm the spatial extent of this impact.

Regional/Local

Parts of the proposed site lie within areas which are shown on Environment Agency (EA) maps as being at risk of coastal flooding. Accordingly, during the life span of proposed nuclear power station, and as a result of potential sea-level rises, the site is likely to require the construction of additional or upgraded coastal defences. These defences would be designed to counteract the effects of existing coastal processes such as coastal retreat, but are likely to have the secondary effect of impacting the tidal-driven movement of sediment in the estuary. These may have further effects on estuarine and marine ecosystems. The effects are likely to continue as long as the coastal defences need to be maintained to protect the site. It is likely, however, that after a period of time, a new, stable equilibrium condition will be attained. It is not possible to assess whether these effects will be positive or negative without further information on the proposed design of the defences, and a more detailed investigation of the local and regional estuarial and coastal physical processes/dynamics. For example, if the new coastal defences lead to accelerated erosion, increased flood risk or loss of habitat, the effects will be negative; alternatively, if the new defences improve protection in adjacent areas, their effects would be positive. The effects of the construction and long-term presence of upgraded coastal defences on coastal process, hydrodynamics and sediment transport within the estuary could be reduced or possibly eliminated by the adoption of suitable, environmentally-friendly designs.

Water: Hydrology and Geomorphology

2. The provision of cooling water for the proposed power station may require excavation/dredging in the foreshore and coastal waters to enable the construction of a channel and/or pipeline for the abstraction and return of the cooling water. Construction disturbance associated with these works may have the short-term effect of accelerated delivery of sediment to water bodies during construction. Over the longer-term, during operation, there is the possibility that the discharge of cooling water may affect local estuarine hydrodynamics and sedimentation processes. The effects of construction and operation of the cooling water system on coastal processes and hydrodynamics and sediment transport within the estuary could be reduced or potentially eliminated by suitable design and construction methods.

3. The potential effects of the development on the local river network includes the modification of the local drainage network through local diversion of small watercourses and drainage ditches, the removal of riparian vegetation and associated bank collapse, and increased loading of channel banks from construction machinery. During construction there is also a risk of increased sediment transfer to water courses from excavated areas and stockpiles. In addition, there is the risk of increased transfer of sediment from site drainage and from dredging activities to water bodies. The development is also likely to affect surface water run-off through increasing the surface of impermeable areas (for example roads and car parking areas). These potential adverse effects may, however, be reduced by suitable mitigation methods, for example, Sustainable Drainage Systems (SuDs), including the use of permeable pavements, and retention ponds or swales to retain drainage water and sediments.

Timescale	C	O	D
Significance	-	-	-
Likelihood	M	M	M

Significant Effects

- Additional coastal defence works on coastal processes, estuarine hydrodynamics and sediment transport, and any indirect effects on internationally designated habitats.
- Works to provide (and discharge) cooling water on coastal processes, estuarine hydrodynamics and sediment transport, and any indirect effects on internationally designated habitats.

Mitigation and Monitoring Possibilities

- Suitable design, including use of SuDs.
- selection of appropriate construction methods

Water: Water Quality (including surface, coastal and marine)

AoS objective:

16. To avoid adverse impacts on water quality (including surface, coastal and marine water quality) and to help meet the objectives of the Water Framework Directive.

Guide questions:

Will it cause deterioration in surface water quality as a result of accidental pollution, for example spillages, leaks?
Will it cause deterioration in coastal and / or marine water quality as a result of accidental pollution, for example spillages, leaks?
Will it cause deterioration in surface water quality as a result of the disturbance of contaminated soil?
Will it cause deterioration in coastal and / or marine water as a result of the disturbance of contaminated soil?
Will it affect designated Shellfish Waters?
Will it affect Freshwater Fish Directive sites?
Will it increase turbidity in water bodies?
Will it increase the temperature of the water in water bodies?

Potential Receptors:

- Local and district resident population and tourists
- Local and district ecosystems in coastal and estuarial waters and on foreshore
- Regional and international receptors could potentially be affected by releases of persistent contaminants

Potential Significant Effects and Mitigation Possibilities:

International/National/Transboundary

Not significant.

Regional/Local

1. The main liquid discharges from the proposed power station during routine operation will be treated effluent from the wastewater treatment plant and the return of cooling water to the estuary at elevated temperatures (if this mode of cooling were to be selected). The EA will be responsible for consenting the discharges and it is anticipated that they will seek to apply standards that ensure that the discharges lead to no deterioration in water quality or meet the statutory water quality standards (whichever is the most stringent).

Water: Water Quality (including surface, coastal and marine)

2. In the case of the discharge of cooling water it is unlikely to be feasible to eliminate some changes in thermal conditions locally, particularly at times of low tide when the volume of water in the estuary is at a minimum. Detailed appraisal of the proposals for disposal of cooling water will be required to assess the acceptability of this effect. Existing power stations with cooling water discharges are operating at the site and no adverse impacts on the Natura 2000 sites in the estuary have been recorded thus far.

3. Liquid waste streams are separated from the radioactive materials; accordingly radioactive materials are not expected to be present in any of the routine discharges of liquid waste. It is expected that liquid discharges will be treated to standards set by the EA to ensure compliance with all relevant legislation.

Summary of Significant Effects:

	C	O	D
Timescale	C	O	D
Significance	-	-	?
Likelihood	M	M	M

Significant Effects

- Thermal impact of cooling water discharges (if this mode of cooling were to be adopted). However, this effect is of local and regional significance, particularly because of the potential impacts on the Natura 2000 sites.

Mitigation and Monitoring Possibilities

- Thermal discharges will need to be consented by the EA. The discharge quality will need to comply with existing standards or meet the no deterioration standard.

Water: Water supply and demand

AoS objective:

17. To avoid adverse impacts on the supply of water resources.

Guide questions:

Will it adversely affect water supply as a result of abstraction?
Will it increase demand for water?

Water: Water supply and demand

Potential Receptors:

- Local and district resident population and tourists. District ecosystems dependent surface water features.

Potential Significant Effects and Mitigation Possibilities:

International/National/Transboundary.

Not significant.

Regional/Local

The site lies within the River Parrett catchment. Surface and groundwater in the vicinity of the site is not currently used for water supply. Hence the proposed development is not expected to have any significant impact on water resources in the area.

2. The construction and operation of the proposed nuclear power station may, however, increase demand for potable supplies both at the site and in local communities where the workforce will live. Depending on the nature of the demand and the potential efficiency savings, there may be implications for meeting this demand. However, this is unlikely to be significant in the operational phase where the numbers of additional workers is small; it may be more significant during the construction period when a substantial increase in the local population is likely.

3. Increased water supply would probably be derived from outside the existing Wessex Water “West” Water Resource Zone (WRZ) with water transferred from adjacent zones, hence additional water supply could impact District aquatic ecosystems within and downstream of catchments used to provide additional water.

Water: Water supply and demand

Summary of Significant Effects:	Timescale	C	O	D
	Significance	-	O	O
	Likelihood	M	H	H

Significant Effects	Mitigation and Monitoring Possibilities
• Increased demand during the construction phase. The potential magnitude and duration of increased water demand will depend on the timing of the new site development in relation to the activities (operation or decommissioning) of the existing site. Similar Significant effects are likely to apply to wastewater production from the site.	• Studies to ensure that capacity of water and wastewater infrastructure in WRZ is sufficient.

Water: Groundwater Quality and Flow

AoS Objective:

18. To avoid adverse impacts on groundwater quality, distribution and flow and to help meet the objectives of the Water Framework Directive

Guide questions:

Will it cause deterioration in groundwater quality as a result of accidental pollution, for example spillages, leaks?
Will it cause deterioration in groundwater quality as a result of the disturbance of contaminated soil?

Potential Receptors:

- Local and district resident population and tourists, local and district ecosystems with connections to groundwater.

Water: Groundwater Quality and Flow

Potential Significant Effects and Mitigation Possibilities:

International/National/Transboundary.

Not significant.

Regional/ Local

1. There are no major aquifers in the vicinity of Hinkley Point and hence no Groundwater Protection Zones (GPZ) in close vicinity of the site. The geology and hydrogeology at the site do not provide any connectivity between activities at the site and major aquifers in the locality. Minor aquifers are present at the site and could be used locally for private water supplies, and discharges from these groundwater bodies may support local groundwater dependent surface water aquatic ecosystems. Localised groundwater pathways are likely to exist, hence accidental discharges or construction disturbance at the site could cause deterioration in groundwater quality and flow quantity in local minor aquifers.

2. Increased water supply would probably be derived from outside the existing Wessex Water 'West' water resource zone with water transferred from adjacent zones. Additional water supply could impact groundwater bodies used to provide additional water. Increased groundwater abstraction could lead to impacts on groundwater dependent surface water features and aquatic ecosystems.

Summary of Significant Effects:

Timescale	C	O	D
Significance	0	0	0
Likelihood	M	M	M

Significant Effects

- Potential impacts on local groundwater bodies.

Mitigation and Monitoring Possibilities

- Studies to ensure that local groundwater bodies are investigated and suitable design is adopted to mitigate potential impacts.

Flood Risk

AoS Objective:
14. To avoid increased flood risk (including coastal flood risk) and seek to reduce risks where possible
Guide questions:
Will it result in demand for higher defence standards that will impact on coastal processes?

Potential Receptors:

- Site workers.
- Local, District ecosystems in coastal and estuarial waters and on foreshore.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

The potential effects on channel geomorphology are likely to be limited to the local area, the impact of construction of new/ improved defences (if these are required) may impact on coastal processes, the geographic spread of this impact is unknown without further investigation.

Regional/ Local

Parts of the site lie within Flood Zone 3 on the Environment Agency Flood Map, meaning it is at risk of coastal flooding up to a 1/200 year event. The site is currently protected by defences which afford a standard of protection of 1/200 years. Over the lifetime of the development and taking into consideration the impacts of sea level rise it is likely that if the existing crest level of the defences is not raised then flood risk could be increased to the site. However it must be remembered that flood risk is not likely to increase as a direct result of the development but the flood risk to the development is likely to increase as a result of sea level rise.

Therefore, it is likely that development of the site will require construction of new or upgraded coastal defences. At this location where there are active coastal processes including slow retreat of the coast and large sediment movements in the strong tidal currents of the estuary, the possibility that coastal defences will have a significant effect on sedimentation and the geomorphology of the estuarial and coastal waters cannot be ruled out. These effects will continue for as long as coastal defences need to be maintained to protect the site. It is difficult to assess whether these effects will be positive or negative without more detail of the proposals and analysis of their effects. For example, if the new coastal defences constructed to protect the site lead to erosion and increased flood risk or loss of habitat in adjacent areas, the impact will be negative. Alternatively if the new defences improve protection in adjacent areas, their impact would be positive.

Flood Risk

The site could also be designed to mitigate against the residual effects of flood risk, for example in the event of overtopping/breach of the coastal defences, this could be achieved by locating the most vulnerable infrastructure in the areas of the site at lowest flood risk.

Summary of Significant Effects:	Timescale	C	O	D
	Significance	-	-	-
	Likelihood	M	M	M

Significant Effects	Mitigation and Monitoring Possibilities
• Main effects are through interference of any new coastal defence works on coastal processes.	• It may be possible to mitigate these effects by suitable design and selection of appropriate construction methods and also appropriate management of the defences.

Appendix 3: Plans and Programmes Review

Draft Regional Spatial Strategy for the South West 2006-2026 (South West Regional Development Agency)

The Draft RSS for the South West is intended to replace the existing Regional Planning Guidance for the South West. It outlines sub-regional policy and guidance for the environment, housing, transport and the economy and employment.

Housing and Employment:

- Bridgwater is identified as a Strategically Significant Town and the Draft RSS requires that an average of 310 dwellings per year is provided up to 2026.
- Provision for job growth in the Taunton and Bridgwater travel to work areas will be made for 18,500 jobs over the plan period.

Transport:

- Development of the A303/A358 as a strategic route.
- Promotion of strategic network for HGV as opposed to country routes.

Nature Conservation:

- The distinctive habitats and species of the South West will be maintained and enhanced in line with national targets and the South West Regional Biodiversity Action Plan.

Historic Environment:

- The historic environment of the South West will be preserved and enhanced.

Coastal Planning:

- In order to improve coastal planning and achieve a consistent, cross boundary approach local authorities on the coast will co-ordinate development plans, Shoreline Management Plans and other programmes affecting the coastal zone and support the sustainable planning and management of adjacent coastal areas, by working across borders, as in the Severn Estuary Partnership.

Flood Risk:

- Protect flood plains and land liable to tidal or coastal flooding from development
- Use development to reduce the risk of flooding through location, layout and design
- Relocate existing development from areas of the coast at risk, which cannot be realistically defended.

Draft Regional Spatial Strategy for the South West 2006-2026 (South West Regional Development Agency)

Renewable Energy:
- By 2010 a minimum target of 509 to 611 MWe installed generating capacity, from a range of onshore renewable electricity technologies - Somerset - 61-81.

Water Resources:
- The region's network of ground, surface and coastal waters and associated ecosystems will be protected and enhanced.

Air Quality:
- The impacts of development proposals on air quality must be taken into account.

Radioactive Waste:
- The Draft RSS states that it is not appropriate to consider further details of possible management and disposal options for radioactive waste stored in the region until the national reviews on managing radioactive waste have been completed.

LINK: http://southwest-ra.gov.uk/ngcontent.cfm?a_id=538

Regional Economic Strategy for South West England 2006-2015 (South West Regional Development Agency)

The Regional Economic Strategy (RES) provides a shared vision for the development of the region's economy. The RES is therefore concerned with the economy of the South West, within the wider context of sustainable development. The Strategy concentrates on those issues which are directly related to improving the economy and ensuring that more people can participate in that economy. It also recognises that a strong social fabric is an important part of the overall well being in the region.

The Vision of the RES is that "*South West England will have an economy where the aspirations and skills of our people combine with the quality of our physical and cultural environment to provide a high quality of life and sustainable prosperity for everyone*". The vision will be realised through three strategic objectives:
- Successful and competitive businesses

- Strong and inclusive communities
- An effective and confident region

LINK: http://www.southwestrda.org.uk/what-we-do/policy/res-review2005/draft-res.shtm

Creating Sustainable Communities in the South West 2005 (Office of the Deputy Prime Minister)

The report describes the actions that will take place to create sustainable communities in the South West up to 2010.

The report focuses on:

- achieving a better balance between housing availability and the demand for housing - including improving affordability
- ensuring people have decent places to live - including cleaner, safer and greener localities
- tackling disadvantage, including homelessness
- delivering better services through strong effective local government
- promoting the development of the region

LINK: http://www.gos.gov.uk/gosw/peoplesc/scomms/

One Wales: A Progressive Agenda for the Government of Wales 2007 (Welsh Assembly Government)

The One Wales document sets out an agenda to make Wales a strong nation with a sustainable environment and shows the Government programme for its four year term.

The programme discusses the Government plan to create a sustainable environment in Wales, with targets including:

- Aim to achieve annual carbon reduction-equivalent emissions reductions of 3% per year by 2011
- Promotion of energy efficiency, renewable technologies and renewable energy production
- Better and more co-ordinated waste management

One Wales also addresses other broad areas such as housing, communities, culture and education.

LINK: http://wales.gov.uk/about/strategy/publications/onewales/?lang=en

Our Environment: Our Future - The Regional Strategy for the South West Environment 2004-2014 (South West Regional Assembly in association with the South West Regional Environmental Network)

This document highlighted the richness and diversity of the South West environment and its importance to the region's economy and people's sense of well-being. It proposes a Vision and Aims for the region's environmental assets, and identifies a range of pressures on and opportunities for these assets. This leads to the selection of six key issues that need to be tackled, with proposed objectives and actions for addressing each issue.

The objectives are:

- To minimise greenhouse gas emissions and respond to the risks, challenges and opportunities presented by climate change.
- To ensure that our natural resources are used sustainably, with minimum environmental damage and waste generation, so as to reduce pollution and protect the quality of the region's environment.
- To enhance the ability of the food, farming and forestry sectors to provide the environmental and social benefits that people in the region need and expect, and help to secure a viable future for them.
- To promote a tourism and leisure industry that conserves and enhances the environment and recognises the region's distinctiveness.
- To promote the wise use of land and a safe and healthy environment for local communities, through the provision of well designed, resource efficient development, contributing to sustainable development through environmental enhancement and ensuring that the South West remains a region of diverse and distinctive heritage, wildlife and landscapes.
- To minimise the environmental impact of the travel and transport necessary to support the social and economic needs of the region.

LINK: http://www.southwest-ra.gov.uk/ngcontent.cfm?a_id=521&tt=swra

Environment Strategy for Wales 2006 (Welsh Assembly Government)

The Environment Strategy for Wales sets the strategic direction to 2026 and aims to provide a framework within which to achieve an environment which is clean, healthy, biologically diverse and valued by the people of Wales. It is supported by regularly updated action plans and a policy map.

The strategy outlines the following vision: "By 2026, we want to see our distinctive Welsh environment thriving and contributing to the economic and social wellbeing and health of all of the people of Wales."

The priorities for the Welsh environment identified in the strategy are:

- minimise our greenhouse gas emissions and adapt to the impacts of climate change
- conserve and enhance our biodiversity, while respecting the dynamics of nature
- monitor and regulate known and emerging environmental hazards
- tackle unsustainable practices, like waste production and disposal

- conserve and enhance our land and sea, our built environment, our natural resources and heritage, developing and using them in a sustainable and equitable way and for the long term benefit of the people of Wales.

LINK: http://www.southwest-ra.gov.uk/ngcontent.cfm?a_id=521&tt=swra

South West Climate Change Action Plan 2008-2010 (South West Regional Assembly)

The Action Plan sets out a programme of regionally agreed priority actions to address both mitigation and adaptation activity. The main areas of mitigation activity within the SWCCAP include tackling emissions from existing housing, business and public sector operations, transport, new build, energy generation, and land management. Adaptation activity covers: the region's strategic response to climate change; awareness raising; land and marine management; and adapting to flood risk.

The relevant priority objectives are to:

- Identify the parts of the region most vulnerable to extreme weather events and undertake actions to increase resilience.
- Increase business preparation for climate change
- Ensure regional landuse practices take account of the impacts of climate change and promote adaptation responses
- Ensure that all relevant regional and sub-regional bodies understand the impacts of, and take action to respond to, increasing flood risk.
- Embed long term carbon management and resource efficiency in business planning and investment and economic development
- Undertake regional activity to support regional and local multi-modal carbon reduction and demand management
- Stimulate the increased installation of renewable energy technologies in the region
- Provide support and coordination of activity to achieve low and zero carbon new development by 2016 (housing) and 2019 (non domestic sector)

LINK: http://www.southwest-ra.gov.uk/media/SWRA/Climate%20Change/Climate_Change_Action_Plan.pdf

From Rubbish to Resource: The South West Regional Waste Strategy 2004-2020 (South West Regional Assembly)

The Regional Waste Strategy aims to ensure that by the year 2020 over 45% of waste is recycled and reused and less than 20% of waste produced in the region will be landfilled. The strategy defines key areas for action, such as adopting the waste hierarchy, to be carried out by the people of the region and by organisations in order to achieve the aim and reduce the amount of waste being produced. The strategy's policies and actions address local authorities, the waste industry, non-governmental organisations and community groups. Spatial elements of the Regional Waste Strategy have been incorporated into the Draft RSS policies on waste management.

LINK: http://www.creatingexcellence.org.uk/uploads/Waste-Strategy-12_10_04.pdf

South West Biodiversity Action Plan 1997 (The South West Biodiversity Partnership)

The South West Biodiversity Action Plan (SWBAP) identifies 18 habitats and 12 species within the region for which specific action plans have been produced.

Regional habitat and species action plans have been produced for the following reasons:

- To make it easier for the UK biodiversity plans to be implemented at the local level
- To enable organisations that function at a regional (or similar administrative boundaries) to recognise those conservation priorities relevant to their boundaries
- To inform regional planning of the main biodiversity issues within the South West
- To ensure the best possible information base on which decisions can be made
- To provide consistent information and identify priorities

The SWBAP has not been updated since1997, but the South West Biodiversity Implementation Plan, which was launched in 2004, provides updated targets for habitats (coastal and marine habitat targets, spatial habitat targets and other habitat targets) and promotes the following priorities:

- Maintain and enhance biodiversity
- Develop integrated sustainable land management practices
- Increase awareness and understanding of the regional importance of biodiversity
- Understand and manage the dynamic processes of change

LINK: http://www.ukbap.org.uk/Library/SWBIP_Final.pdf

River Basin Management Plan for the South West 2009 (Environment Agency)

This plan describes how the region will meet the challenge of the Water Framework Directive to improve the quality of every aspect of the water environment in the South West. The plan proposes new actions to manage the water environment in the South West river basin district.

The key targets of the plan are:

- By 2015, 22% of surface waters (rivers, lakes, estuaries and coastal waters) will improve for at least one element
- 42% of surface waters will be at good or better ecological status/potential and 57% of groundwater bodies will be at good status by 2015
- At least 61% of assessed surface waters will be at good or better biological status by 2015

The following challenges are addressed in the plan:

- diffuse pollution from agricultural activities
- diffuse and point source pollution from disused mines
- point source pollution from water industry sewage works
- physical modification of water bodies

LINK: http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/southwest/Intro.aspx

West Somerset Catchment Flood Risk Management Plan 2008 (South West Region)

The aim of this Catchment Flood Management Plan (CFMP) is to help understand the scale and extent of flooding now and up to 100 years into the future, and to set policies for managing flood risk within the catchment. The CFMP should be used to inform planning and decision making by key stakeholders such as the Environment Agency, local authorities, water companies, transportation planners, land owners, the public and businesses. The aim of a CFMP is to promote more sustainable approaches to managing flood risk.

The West Somerset CFMP has a catchment area of approximately 320 square kilometres and has a population of 31,000. It is a rural catchment, with urban areas making up only four per cent of the total. The rivers of the CFMP drain from Exmoor and the Quantocks, flowing north to the Bristol Channel. These include the River Anvill, Pill River, Washford River, Monksilver Stream, Doniford Stream, Hawkcombe Stream, Horner Water and River Aller. The geology of West Somerset has low permeability, this contributes to the high level of overland flow and the rapid response of the rivers to rainfall. The downstream limits of the CFMP area meets with the upstream boundary of the North Devon and Somerset Shoreline Management Plan boundary at the Bristol Channel coast.

The West Somerset catchment is divided into eight sub-areas which have similar physical characteristics, sources of flooding and level of risk. The site is located in sub-area 8 (Hills and Cliffs) which is classified as being an area with little or no flood risk.

Due to the steep topography, this sub-group responds very quickly to rainfall. These sub-areas have historically experienced little fluvial flooding. Instead, flood risk is significantly from surface water processes, such as sheet run-off. Currently two properties are at risk during the 1% annual probability flood event. This figure is not expected to change. The risk from surface water flooding includes agricultural land, recreational accesses and nationally and internationally designated sites. Local roads may also be affected. Flood risk from surface water flooding is likely to increase in the future as a result of climate change.

The preferred policy option is to continue to monitor and advise. There are no specific actions identified for this area.

LINK: http://publications.environment-agency.gov.uk/pdf/GESW1109BOUF-e-e.pdf

North Devon and Somerset Shoreline Management Plan 1998 (North Devon and Somerset Coastal Group)

The aim of this Plan is to provide a framework for the development of sustainable coastal defence policies from Hartland Point to Brean Down. There are 10 core shoreline management objectives which apply throughout the length of coast covered by the SMP - Coastal Processes, Coastal Defence, Natural Environment, Landscape, Archaeology, Land Use Planning and Tourism/Recreation.

The Natural Environment objective is to: Where possible, preserve “Critical Natural Capital” in situ, maintain the stock of “Constant Natural Assets”, identify opportunities to create new inter-tidal habitats to compensate for past and anticipated future loss, and wherever possible preserve species and wildlife habitats in line with the UK Biodiversity Action Plan.

A review of the North Devon and Somerset SMP commenced in late 2007 (SMP2). The final SMP is expected to be available once it has been adopted in Autumn 2010. A summary of the draft final SMP2 was issued on June 2010, which identifies changes to reflect nominations for a new power station at Hinkley Point. It identifies a ‘hold the line’ policy in the short, medium and long terms by maintaining, or possibly constructing new, sea defences. If defences are not required to protect new nuclear facilities at Hinkley Point, ‘no active intervention’ will instead occur.
LINK: http://www.ndascag.org/SMPnd.html

Appendix 4: Baseline Information

Note: Information on Comparators and Trends is included where applicable/available.

Air

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Air				
South West Air Quality	1, 2, 3	Air quality in the South West is generally good with low levels of sulphur, nitrogen dioxide and particulates in comparison to the rest of England. However, pockets of poor air quality exist in the region, especially within large urban industrial areas such as Bristol. There are 28 Air Quality Management Areas (AQMA) in the South West, none of which are in West Somerset.		The average number of days with moderate or higher air pollution has generally decreased significantly in urban areas since 1993, largely because of a reduction in particles and sulphur dioxide. In rural areas, where ozone is the main cause of pollution, there has been no overall trend. Ozone levels are naturally high in the South West due to the close proximity to the coast and high altitudes.

Key to Data Sources

1	South West Observatory (2008). State of the South West. http://www.swo.org.uk/information-publications/state-of-the-south-west/ [accessed 13 February 2009]
2	Met Office: Regional Climate – South West England http://www.metofficfov.uk/climate/uk/sw/ [accessed 03 March 2009]
3	UK Air Quality Archive. http://www.airquality.co.uk/archive/laqm/laqm.php [accessed 03 March 2009]

Biodiversity and Ecosystems

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Biodiversity and Ecosystems				
The South West Biodiversity Action Plan **Protected Habitats**	1	18 habitat types are recognised within the South West Biodiversity Action Plan, 6 plans (coastal sand dunes, coastal floodplain and grazing marsh, estuaries, maritime cliffs and slopes, reedbeds and sea grass beds) are considered particularly relevant to Hinkley Point. Nearly a tenth of the Region's land area is designated as nationally and internationally important wildlife sites, many of which are unique in Europe. The maritime environment is particularly significant in the South West as the ratio of coastline to land area is the highest of any region. At a more local level, areas of wildlife value may be designated as local nature reserves, county wildlife sites or non-statutory nature reserves. The South West supports a high proportion of some of the UKs rarest and most endangered habitats. Many are UK priority. Many of these, especially soft coastal habitats (for example Bridgwater Bay), have been identified as particularly vulnerable to climate change.		
The South West Biodiversity Action Plan **Protected Species**	2	The South West Biodiversity Action Plan was developed in 1997. It has since been updated and complemented with the South West Biodiversity Implementation Plan. 12 species are recognised within the South West Biodiversity Action Plan, 3 plans (great crested newt, water vole and pipistrelle bat) are considered particularly relevant to Hinkley Point. The South West supports some 25 species that are globally important, over 700 species that are of national conservation concern, and 34 species endemic to the UK, 11 of which are only found in the South West.		

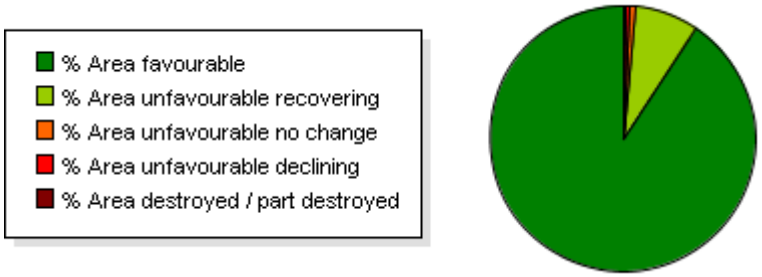
Indicator	Data Source	Current Data	Comparators	Trend
West Somerset Biodiversity Action Plan	3	In 1999 the West Somerset Biodiversity Action Plan was published and it laid out a series of actions that was needed to be taken at a regional level to halt the decline in the diversity of the countryside, but also to have measures to promote certain sensitive indicators. 5 habitat action plans have been prepared, 2 (coastal vegetated shingle and saballaria alveolata reefs) of which is considered particularly relevant to Hinkley Point. 3 species action plans have been prepared, 1(water vole) of which is considered particularly relevant to Hinkley Point.		
Natura 2000 sites (N2K)	4	There are six N2K sites within [15]20 km of Hinkley Point: • Exmoor and Quantocks Oakwoods SAC • Hestercombe House SAC • Mendip Limestone Grasslands SAC • Somerset Levels and Moors SPA • Severn Estuary SAC and SPA, including constituent SSSIs: o Penarth Coast SSSI o Bridgwater Bay SSSI o Flat Holm SSSI o Severn Estuary SSSI o Upper Severn Estuary SSSI o Sully Island SSSI o Blue Anchor to Lilstock Coast SSSI • River Usk SAC, including constituent SSSIs: o River Usk (Upper Usk) SSSI o River Usk (Lower Usk) SSSI o River Usk (Tributaries) SSSI o Penllwyn-yr-hendy SSSI o Coed Dyrysiog SSSI o Coed Nant Menascin SSSI o Coed Ynysfaen SSSI The SAC has been divided into 10 management units: o Units 1 to 3 - River Usk (Lower Usk) SSSI. o Units 4 to 6 - River Usk (Upper Usk) SSSI.		

[15] Apart from River Usk SAC & River Wye SAC which fall outside the 20 km search area but are included because they have hydrological connections to the Severn Estuary.

<table>
<tr><th>Indicator</th><th>Data Source</th><th colspan="2">Current Data</th><th>Comparators</th><th>Trend</th></tr>
<tr><td></td><td></td><td colspan="2">o Units 7 to 10 - River Usk (Tributaries) SSSI.
• River Wye SAC, including constituent SSSIs:
o River Wye (Lower Wye) SSSI - Management units 1A to 1D;
o River Wye (Upper Wye) SSSI - Management units 2A and 2B;
o River Wye (Tributaries) SSSI - Management unit 3;
o Afon Llynfi SSSI - Management unit 4;
o Duhonw SSSI - Management unit 5;
o Afon Irfon SSSI - Management unit 6;
o River Ithon SSSI - Management unit 7;
o Upper Wye Tributaries SSSI - Management unit 8; and
o Colwyn Brook Marshes (North and South) SSSI</td><td></td><td></td></tr>
<tr><td>Ramsar sites</td><td>4</td><td colspan="2">There are two Ramsar sites within 20 km of Hinkley Point:
• Severn Estuary Ramsar
• Somerset Levels and Moors Ramsar</td><td></td><td></td></tr>
<tr><td>Sites of Special Scientific Interest (SSSI)</td><td>5</td><td colspan="2">There are 127 SSSI within Somerset County of which 30 are situated within West Somerset.
<table><tr><th></th><th>% Area meeting PSA target</th><th>% Area favourable</th><th>% Area unfavourable recovering</th><th>% Area unfavourable no change</th><th>% Area unfavourable declining</th><th>% Area destroyed/part destroyed</th></tr><tr><td>South West</td><td>81.18%</td><td>50.51%</td><td>33.67%</td><td>10.49%</td><td>5.29%</td><td>0.04%</td></tr><tr><td>Somerset</td><td>73.91%</td><td>45.87%</td><td>28.04%</td><td>24.50%</td><td>1.58%</td><td>0.00%</td></tr></table>Of most relevance is Bridgwater Bay SSSI, adjacent to the nominated site.</td><td></td><td></td></tr>
</table>

<table>
<tr><th>Indicator</th><th>Data Source</th><th>Current Data</th><th>Comparators</th><th>Trend</th></tr>
<tr><td>Bridgwater Bay SSSI</td><td>5</td><td colspan="2">Bridgwater Bay comprises a succession of habitats ranging through inter-tidal mudflats, saltmarsh, shingle beaches, and grazing marsh. The area is intersected by a complex network of freshwater and brackish ditches known as rhynes. The site contains one of the largest areas of saltmarsh in Somerset, and one of the most extensive common cord-grass swards in the Severn Estuary.

The SSSI supports nationally rare plants, invertebrates, and significant numbers of wintering and passage waders and wildfowl. Internationally important numbers of dunlin, shelduck, wigeon, curlew, redshank and teal.

<u>Condition Summary of Bridgwater Bay SSSI:</u>
<table>
<tr><th>% Area meeting PSA16 target</th><th>% Area favourable</th><th>% Area unfavourable recovering</th><th>% Area unfavourable no change</th><th>% Area unfavourabl declining</th></tr>
<tr><td>98.43%</td><td>90.56%</td><td>7.87%</td><td>0.90%</td><td>0.67%</td></tr>
</table>

</td><td></td></tr>
<tr><td>National Nature Reserves (NNR)</td><td>6</td><td colspan="2">There are 48 NNR within the South West, 13 within Somerset. The following NNR are considered relevant to Hinkley Point:
• Huntspill River NNR</td><td></td></tr>
</table>

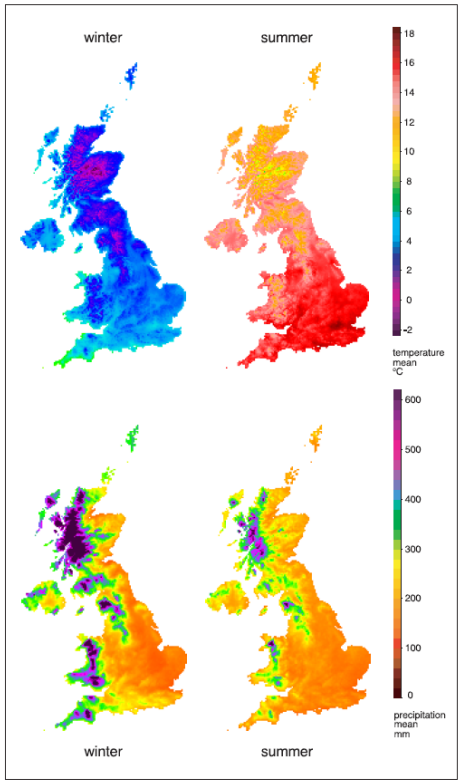
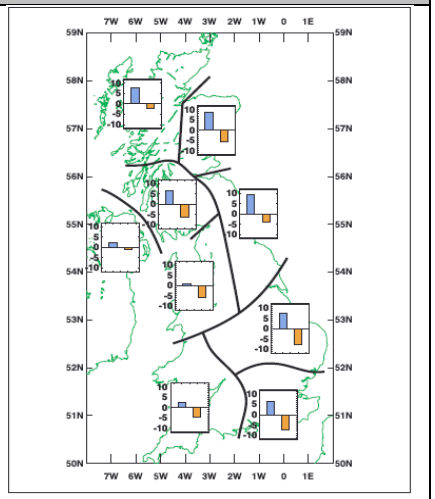
[16] PSA Target = The Government's Public Service Agreement (PSA) target to have 95% of the SSSI area in favourable or recovering condition by 2010.

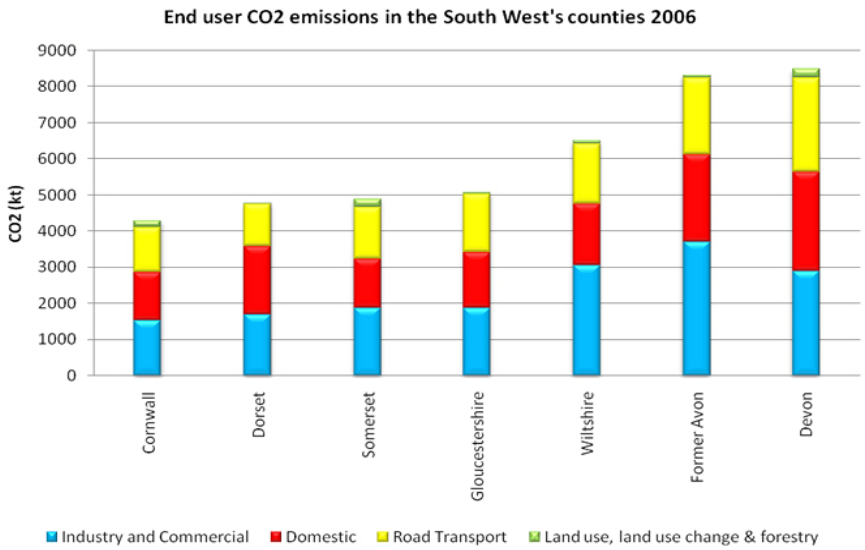
Indicator	Data Source	Current Data	Comparators	Trend
		• Somerset Levels NNR • Westhay Moor NNR • Bridgwater Bay NNR • Shapwick Heath NNR		
Local Nature Reserves (LNR)	7	There are 179 LNR within the South West, 38 within Somerset. Berrow Dunes is considered relevant to Hinkley Point.		
Local Wildlife Sites	8	Nine County Wildlife Sites (CWS) are present within 3 km of the proposed new build area. Hinkley Point CWS is within the nominated site at Hinkley Point.		

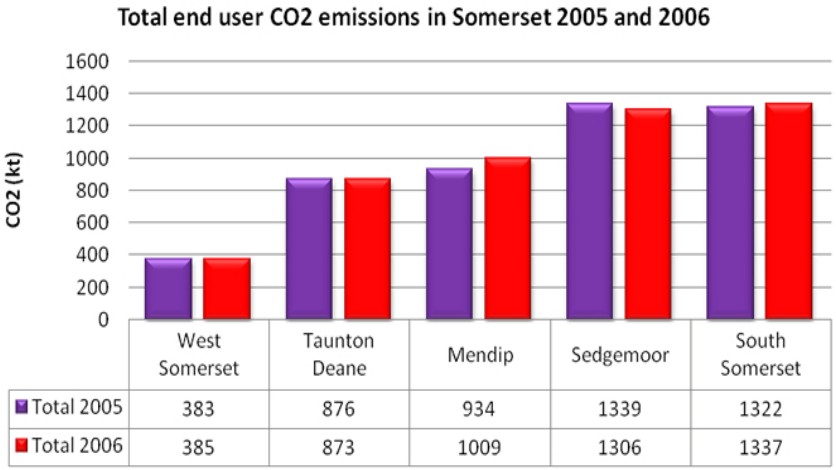
Key to Data Sources

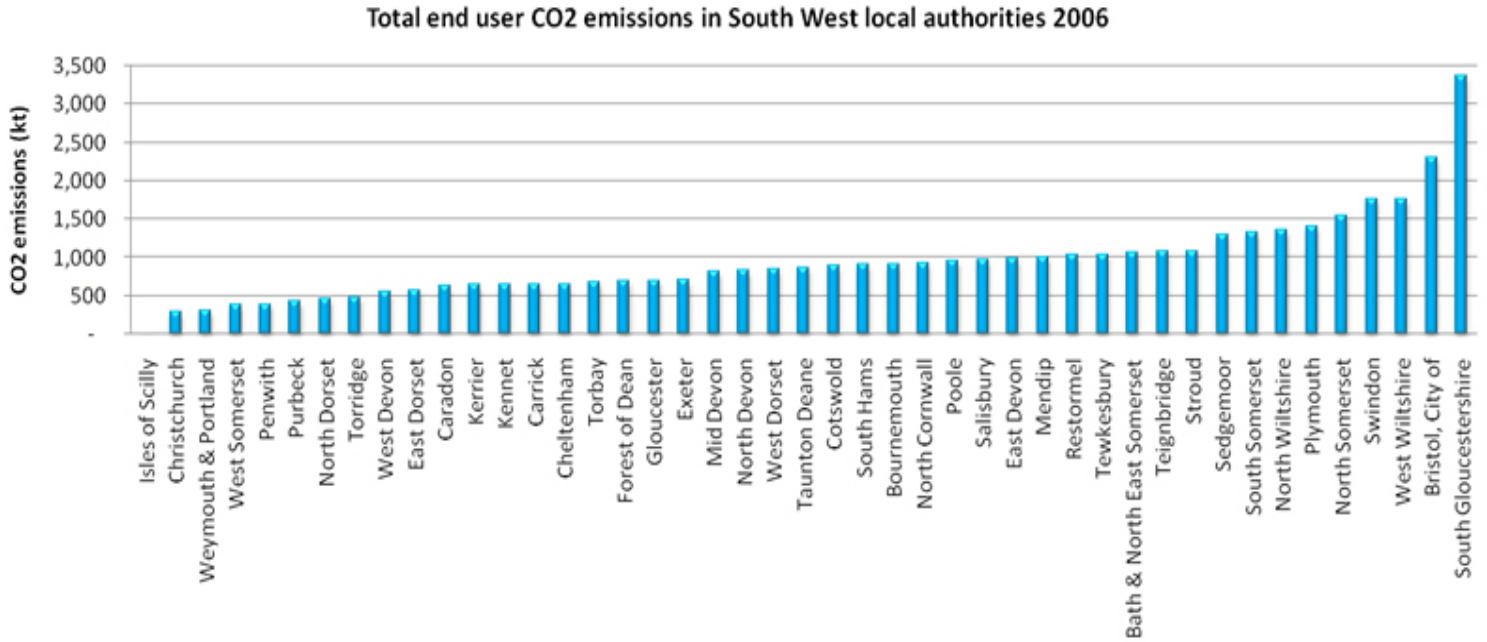
1	The South West Biodiversity Action Plan, Habitats. http://www.wildlifetrusts.org/index.php?section=home
2	The South West Biodiversity Action Plan, Species. http://www.wildlifetrusts.org/index.php?section=home
3	West Somerset Biodiversity Action Plan. http://www.ukbap.org.uk/lbap.aspx?ID=485
4	DEFRA MAGIC. Habitat Inventories. http://www.magic.gov.uk/website/magic/
5	Natural England. Site of Special Scientific Interest. http://www.sssi.naturalengland.org.uk/Special/sssi/index.cfm
6	Natural England. National Nature Reserves. http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nnr/default.aspx
7	Natural England. Nature on the Map. http://www.natureonthemap.org.uk/map.aspx?m=nreserves
8	British Energy (2008). Proposed Nuclear Development at Hinkley Point. Environmental Scoping Report. http://www.british-energy.com/documents/Hinkley_Point_Environmental_Scoping_Report.pdf

Climate Change

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Climate Change				
South West Within The Wider Region (Precipitation and Temperatures)	1	The trend in total precipitation resulting from intense weather events in the South West is slightly lower than the UK average. These "most intense events" can have proufound effects on: • Agriculture • Transport • Infrastructure • Electricity transmission systems Temperature, particularly in the West, show a greater sensitivity to the North Atlantic oceanic temperature variations and predominant Easterly winds. This pronounced sensitivity is particularly applicable to Hinkley Point.	 *Figure 18: Average observed 1961-1990 winter and summer temperature (°C, top) and precipitation (mm, bottom) in the UK. Data on a 5 km grid.*	 *Figure 12: The trend (1961 to 2000) in the fraction of the total seasonal precipitation contributed by the "most intense" precipitation events in winter (left-hand bars) and in summer (right-hand bars) for a number of UK regions. Positive (blue) numbers indicate an increasing trend in the proportion of the total precipitation that comes from the "most intense" events, i.e., "most intense" events are increasing either in frequency or in intensity. The lower bound to the class of "most intense" events is defined (separately for each season and region) by an amount (mm) calculated from the 1961 to 1990 period, namely the daily precipitation exceeded on a minimally sufficient number of days necessary to account for precisely 10 per cent of the seasonal precipitation. [Source Tim Osborn]*
South West Green-house Gas Emissions	2	Carbon Emissions: • 42,369 kt of end user CO_2 emissions came from the South West, accounting for 8 % of the UK total and the 5th lowest recorded by a region.		Total emissions increased in all of the South West's counties between 2005 and 2006, with the exception of Devon (-2 %). Wiltshire showed the largest increase (+4 %).

Indicator	Data Source	Current Data	Comparators	Trend
		• 39 % of the South West's emissions came from the industrial and commercial sector, 31 % from the domestic sector, 28 % from road transport and 2 % from land use, land use change and forestry  End user emissions include emissions from electricity generation and fuel processing reassigned to consumers.		

Indicator	Data Source	Current Data	Comparators	Trend
Somerset Greenhouse Gas Emissions	2	4,909 kt of end user CO_2 emissions were released in Somerset in 2006, a 1 % (55 kt) increase on the 4,854 kt released in 2005. Of these emissions: • 38 % (1,879 kt) came from industrial and commercial sources • 29 % (1,440 kt) came from road transport • 28 % (1,364 kt) came from domestic sources • 5 % (227 kt) came from land use, land use change and forestry In 2006, total emissions were highest in South Somerset, which accounted for 27 % (1,337 kt) of the county total, and the lowest were in West Somerset with 8 % (385 kt).  End user emissions include emissions from electricity generation and fuel processing reassigned to consumers.		All local authorities in Somerset showed little change in their total emissions between 2005 and 2006, West Somerset increased by 0.5 % (2 kt).

Indicator	Data Source	Current Data	Comparators	Trend
Local Authorities Greenhouse Gas Emissions	2	 End user emissions include emissions from electricity generation and fuel processing reassigned to consumers.		
Topic: Energy				
Energy	**3,4**	<u>Electricity Consumption 2007 (North Somerset)</u> Average Domestic Consumption: 4,433 kWh Average Industrial Consumption: 57,786kWh <u>Electricity Consumption 2007 (Great Britain)</u> Overall: 309,669.5 GWh Average Domestic Consumption: 4,392 kWh Average Industrial Consumption: 79,077 kWh <u>Total Energy Consumption 2006</u> South West of England: 26,963.9 GWh		

Indicator	Data Source	Current Data	Comparators	Trend
		UK: 2,120,261.5 GWh		
Renewable Energy	**3,4**	Energy Consumption from Renewable Sources 2006 (North Somerset) 7.8 GWh Total Energy Consumption from Renewable Sources 2006 South West of England: 449.3 GWh UK: 6,939.5 GWh		
Current Capacity	**3,4**	There are 4 power stations within a 80km radius of the site. The power stations have a combined capacity of 1152 MW, of which 11.6 MW is wind power. The existing nuclear power station (Hinkley Point B) produces 1250 MW.		

Key to Data Sources

1	United Kingdom Climate Impact Programme (April 2002). Climate Change Scenarios for the United Kingdom. The UKCIP02 Scientific Report. http://www.ukcip.org.uk/images/stories/Pub_pdfs/UKCIP02_tech.pdf [accessed 26 february 2009]
2	South West Observatory. Carbon Dioxide Emissions. http://www.swenvo.org.uk/themes/atmosphere/carbon-dioxide/ [accessed 13 February 2009]
3	Department of Business Enterprise and Regulatory Reform (December 2008). Electricity Consumption Data at Regional and Local Authority Level. http://www.berr.gov.uk/energy/statistics/regional/regional-local-electricity/page36213.html
4	Department of Business Enterprise and Regulatory Reform (October 2008). Total final energy consumption at regional and local authority level. http://www.berr.gov.uk/energy/statistics/regional/total-final/page36187.html

Communities: Population and Economy

Indicator	Data Source	Current Data	Comparators				Trend
Topic: Population							
Age of population	1, 2, 3		**Quantock Vale**	**West Somerset (Non-Metropolitan District)**	**South West**	**England**	Population in the South West has steadily increased over the past 30 years and now has approximately 5 million residents. According to the Office for National Statistics, the region's population grew faster than any other region between 1981 and 2006 at 16.9 %, almost entirely due to migration, mainly from London and the South East. West Somerset has seen a higher percentage increase in population between 1981 and 2006 at 19.7 %, with 32.1 % of the population at pension age or over, which is 10 % higher than other Local Authorities in the County. By 2014 it is estimated that 59,000 (10.6 %) of the Somerset population will be aged over 75 years and 18,000 (3.3 %) aged over 85 years. This represents an increase of 18 % in those aged over 75 years, and 43 % in those aged over 85 years.
		All People (Count)	2,049	35,075	4,928,434	49,138,831	
		People aged 0-4 (%)	4.54	4.34	5.48	5.96	
		People aged 5-7 (%)	3.22	2.91	3.51	3.74	
		People aged 8-9 (%)	2.05	2.09	2.45	2.61	
		People aged 10-14 (%)	4.98	5.52	6.37	6.57	
		People aged 15 (%)	0.78	1.11	1.23	1.27	
		People aged 16-1 (%)	2.10	2.30	2.41	2.51	
		People aged 18-19 (%)	2.00	2.30	2.31	2.40	
		People aged 20-24 (%)	2.24	4.02	5.36	6.01	
		People aged 25-29 (%)	3.95	3.71	5.73	6.65	
		People aged 30-44 (%)	18.11	16.94	21.29	22.65	
		People aged 45-59 (%)	24.89	21.40	19.93	18.88	
		People aged 60-64 (%)	8.98	6.98	5.28	4.87	
		People aged 65-74 (%)	11.62	13.09	9.41	8.35	
		People aged 75-84 (%)	8.30	9.56	6.75	5.60	
		People aged 85-89 (%)	1.66	2.54	1.65	1.30	

Indicator	Data Source	Current Data		Comparators			Trend
		People aged 90 and over (%)	0.59	1.21	0.85	0.64	
		Mean age of population in the area	45.34	45.76	40.60	38.60	
		Median age of population in the area	49.00	48.00	40.00	37.00	
		The population in Quantock Vale and West Somerset is older than the national and regional average, with a higher than average number of people aged over 45 years, and a lower than average number of people aged between 0 years and 44 years. In Quantock Vale about 8.3 % of the population is aged over 75 years, with 2.25 % aged over 85 years. People aged 65 years and older make up approximately 20 % of Somerset's population. This is more than the South West regional proportion which is already the region with the highest proportion in the country.					
Topic: Employment							
Percentage Economically Active – Employed %[17]	1, 4	**Quantock Vale:**	**West Somerset District:**	**South West:**	**England:**		
		Full Time 30.45	28.60	39.08	40.81		
		Part Time 11.89	12.42	13.23	11.81		
		Full time employment levels at ward and district levels are well below (c.10 %) the national and regional average. Part time working is very slightly above the national average at a ward and district level.					
Percentage Economically Active – Unemployed %[18]		2.44	2.94	2.57	3.35		
		Unemployment levels are slightly below the national average at both ward and district level.					

[17] 2001 as percentage of total population aged 16-74
[18] 2001 as percentage of total population aged 16-74

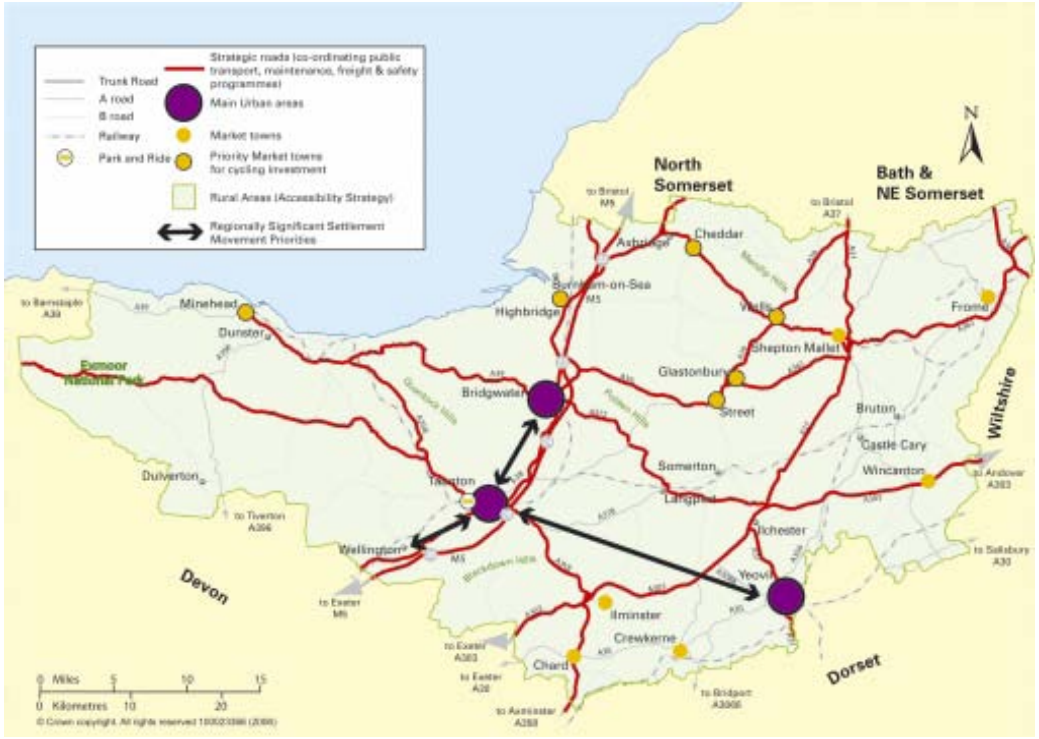
Indicator	Data Source	Current Data		Comparators		Trend
Industry of employment **All persons**		**Quantock Vale** **100% (882)**	**West Somerset District** **100% (14,393)**	**South West** **100% (2,286,108)**	**England** **100% (22,441,498)**	
Agriculture/ Forestry (%)		10.43	7.16	2.49	1.45	
Fishing (%)		0.00	0.12	0.08	0.02	
Mining (%)		0.34	0.10	0.33	0.25	
Manufacturing (%)		12.59	9.94	13.95	14.83	
Electricity/Gas /Water Supply (%)		4.88	1.09	0.77	0.71	
Construction (%)		6.69	7.35	7.24	6.76	
Wholesale/ Retail Trade (%)		14.63	16.40	17.14	16.85	
Hotels/ Restaurant (%)		4.99	13.46	5.60	4.73	
Transport/ Communicatio ns (%)		4.65	4.33	6.19	7.09	
Financial (%)		1.36	1.60	4.26	4.80	
Real Estate (%)		7.71	8.71	11.43	13.21	
Public Admin (%)		3.74	3.89	7.04	5.66	
Education (%)		10.66	6.83	7.56	7.74	
Health and Social Work (%)		12.70	12.33	11.03	10.70	
Other (%)		4.65	6.67	4.90	5.20	
Self Employed (%)		14.60	15.39	10.08	8.32	

Indicator	Data Source	Current Data		Comparators		Trend
Socio-Economic Classifications 2001 (% Persons aged 16-74)		**Quantock Vale**	**West Somerset District**	**South West**	**England**	
Large employers and higher managerial occupations		2.58	1.69	3.00	3.50	
Higher professional occupations		4.23	3.04	4.67	5.11	
Lower managerial and professional occupations		18.30	14.86	18.67	18.73	
Semi-routine occupations		11.43	13.69	12.31	11.65	
Routine occupations		8.98	8.56	8.87	9.02	
Never Worked		1.12	1.52	1.53	2.72	
Full-time students		4.23	4.27	6.30	7.03	

Key to Data Sources

1	Office for National Statistics (2001). Neighbourhood Statistics: Quantock Vale. http://www.neighbourhood.statistics.gov.uk/dissemination/LeadAreaSearch.do?a=3&r=1&i=1001&m=0&s=1233242937109&enc=1&areaSearchText=Quantock+vale&areaSearchType=14&extendedList=false&searchAreas=Search
2	Somerset Primary Care Trust (October 2008). Annual Public Health Report 2007-2008. http://www.somerset.nhs.uk/publications/Annual%20Public%20Health%20Report%20-%20Final%20(complete)%20(2).pdf
3	South West Observatory (2008). State of the South West 2008. http://www.swo.org.uk/information-publications/state-of-the-south-west/) [accessed 13 February 2009]
4	South West Statistics. http://www.statistics.gov.uk/cci/nugget.asp?id=1134

Communities: Supporting Infrastructure

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Transport				
Regional Freight Routes	1	 **Regional Transport Routes** Somerset is crossed by north-east to south-west strategic transport corridors en route to Devon and Cornwall. The main corridors are: **Road** • M5 (Bristol to Exeter); and • A303 (M3 to Exeter).		

Indicator	Data Source	Current Data	Comparators	Trend
		Rail • Bristol to Exeter; • Salisbury to Exeter; and • Westbury to Exeter. The **county road network** may be characterised as: • Unreliable journey times; • Slow overall journey speed; • Environmental impact upon roadside communities; and • Variable standard of highway provision.		
Topic: Waste				
Municipal Waste	2	Somerset County Council was in the top 3 for the lowest waste residual waste per head for a disposal or unitary authority. In 2006/2007 Somerset County Council was in the top 3 performing waste disposal and unitary authorities in the country with a 47.3 % recycling and compost rate. Landfill remains the principal method of waste disposal in the South West. Just over 1.8 million tonnes (62 %) of municipal waste was sent to landfill in the region in 2006/2007, this was slightly higher than the English average of 58 %.		Total municipal waste in the region has increased by just under 11 % since 2000/2001, from just under 2.68 to 2.97 million tonnes in 2006/2007. Although there was a decline in total waste experienced between 2004/2005 and 2005/2006, this trend did not continues in 2006/2007 when an additional 32,000 tonnes (1%) was produced on the previous year. Total household waste continues to increase in the region and was almost 7% higher in 2006/2007 than in 2000/2001, increasing from 2.5 to almost 2.7 million tonnes. Household waste was almost 2% higher in 2006/2007 than in the previous year.
Radioactive and Hazardous Waste		The operation of a new nuclear power station at the site will require the interim storage of spent fuel and intermediate level waste on site for a period of approximately 100 years after operation has ceased. The arrangements for dealing with all types of radioactive and hazardous waste arising from the operation and decommissioning of new power stations, (including gaseous and liquid radioactive discharges), are appraised in Chapter 6 of the Main AoS Report.		

Key to Data Sources

1	Somerset County Council (March 2006). Local Transport Plan 2: 2006 to 2011. http://www.somerset.gov.uk/somerset/ete/transport/localtransportplans/localtransportplan2/index.cfm?override=publications&pubid=
2	South West Observatory (2008). State of the South West 2008. http://www.swo.org.uk/information-publications/state-of-the-south-west/) [accessed 13 February 2009]
3	South West Regional Assembly (June 2006). Draft Regional Spatial Strategy for the South West 2006-2026. http://www.southwest-ra.gov.uk/ngcontent.cfm?a_id=836

Human Health and Well-Being

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Human Health and Well-being				
Community well-being	1	A useful gauge of the overall well-being of the area can be obtained from the various deprivation indices on the Office of National Statistics, Neighbourhood Statistics web page. This data compares the Super Output Area, West Somerset 004C to England as a whole as follows: • Income deprivation slightly more than average • Employment deprivation is approximately average • Health deprivation less than average • Education deprivation approximately average • Barriers to housing and services are much more than average • Crime is much less than average • Living environment deprivation is more than average		
Index of multiple deprivation (2007)	2	The Department of Communities and Local Government's index of deprivation (an index combining a range of economic, social and housing issues into a single deprivation score) shows West Somerset District Council's area ranked as 106 out of 354 (where 1 is most deprived). This ranking shows that the West Somerset area is reasonably deprived.	Other district councils in Somerset are ranked as follows: • Sedgemoor is 169 • Mendip is 217 • North Somerset is 215 • South Somerset is 237 As can be seen from the above, the other district councils in Somerset are less deprived than West Somerset but none are in the top	

<table>
<tr><th>Indicator</th><th>Data Source</th><th>Current Data</th><th>Comparators</th><th>Trend</th></tr>
<tr><td></td><td></td><td></td><td>30% of the least deprived councils in England.</td><td></td></tr>
<tr><td>Age profile (mid 2006)</td><td>1</td><td>In the Super Output Area, West Somerset 004C the age profile of the population is as follows:

<table><tr><th>Age Band (years)</th><th>Percentage</th></tr><tr><td>0 – 15</td><td>16.0</td></tr><tr><td>16 – 64 (males)
16 – 59 (females)</td><td>56.0</td></tr><tr><td>65+ (males)
60+ (females)</td><td>28.0</td></tr></table></td><td>These figures compare to the age profile for the UK as a whole in 2006 as follows:

<table><tr><th>Age Band (years)</th><th>Percentage</th></tr><tr><td>0 – 15</td><td>20.1</td></tr><tr><td>16 – 64 (males)
16 – 59 (females)</td><td>61.6</td></tr><tr><td>65+ (males)
60+ (females)</td><td>18.3</td></tr></table>
As can be seen from the tables, there is a much higher proportion of people in the upper age bracket (retired or approaching retirement) in the Super Output Area, West Somerset 004C than in the UK as a whole. There are also fewer people of working age in the area, therefore.</td><td></td></tr>
<tr><td>General health (2001)</td><td>1</td><td>For the census in 2001, people were asked whether their health over the preceding twelve months was 'good', 'fairly good' or 'not good'. The results for the Super Output Area, West Somerset 004C were as follows:

• Good – 65.3%
• Fairly good – 24.2%
• Not good – 10.5%</td><td>For comparison purposes, the same data for the overall West Somerset area and England are as below:

<table><tr><th></th><th>West Somerset</th><th>England</th></tr><tr><td>Good</td><td>64.7</td><td>68.8</td></tr><tr><td>Fairly good</td><td>25.5</td><td>22.2</td></tr><tr><td>Not good</td><td>9.7</td><td>9.0</td></tr></table>
Overall there appear to be a greater percentage of people reporting poor health in West Somerset and the Super Output Area, West Somerset 004C than in England as a whole.</td><td></td></tr>
<tr><td>Life expectancy at</td><td>1</td><td></td><td></td><td>Data from the same source for previous years show that these</td></tr>
</table>

<table>
<tr><th>Indicator</th><th>Data Source</th><th>Current Data</th><th>Comparators</th><th>Trend</th></tr>
<tr>
<td>birth (Jan 04 – Dec 06)</td>
<td></td>
<td>
<table>
<tr><th></th><th>West Somerset</th></tr>
<tr><td>Males</td><td>79.20</td></tr>
<tr><td>Females</td><td>83.70</td></tr>
</table>
</td>
<td>
<table>
<tr><th>SW of England</th><th>England</th></tr>
<tr><td>78.50</td><td>77.32</td></tr>
<tr><td>82.70</td><td>81.55</td></tr>
</table>

As can be seen from above, the life expectancy in the West Somerset District Council area is good with ages slightly above the national average for England.
</td>
<td>figures for life expectancy at birth in the West Somerset District Council area have risen slightly for both males and females since 2001.</td>
</tr>
<tr>
<td>Infant mortality (Jan 03 – Dec 05)</td>
<td>1</td>
<td>Infant mortality in the West Somerset District Council area for the years in question was 6.2 persons in every 1000.</td>
<td>This compares to the figure of 4.4 persons for the South-west of England region and 5.1 persons per thousand in England as a whole.</td>
<td>Data from the same source for previous years show that figures for infant mortality in the West Somerset District Council area have decreased from a high in 2002-04 but are still higher than they were in 1998-2000.</td>
</tr>
<tr>
<td>Proximity to medical services</td>
<td>3</td>
<td>Medical services in the area of the Hinkley site are as follows:

• There are no General Practitioner (GP) practices within 5 km of the site but there are two (Quantock Medical Centre and Cannington Health Centre) within 10 km of the site.
• Closest hospital is the Burnham-on-Sea War Memorial Hospital (10.3 km) but this has no Accident and Emergency department
• Nearest hospital with an Accident and Emergency department is Weston General Hospital in Grange Road, Weston-Super-Mare which is 17.1 km away
• The nearest hospital providing mental health services to the Little Court Day Hospital which is 10.6</td>
<td></td>
<td></td>
</tr>
</table>

Indicator	Data Source	Current Data	Comparators	Trend
		km away		
Education - examination results for young people (2006 – 07)	1	In the Super Output Area, West Somerset 004C, 61% of pupils achieved 5 or more A*- C grade passes including English and Mathematics at GCSE or equivalent.	This compares to the figure of 43% of students for the West Somerset District Council area and 46% of students for England as a whole.	
Housing – total unfit dwellings (Apr 06)	1	The total percentage of unfit dwellings in the West Somerset District Council area for the year in question was 5.0%.	This compares to a percentage of 3.8% for the South-west of England region and 4.2%for England as a whole.	Data from the same source show that the percentage of unfit dwellings has reduced slightly since April 2001.
Radioactivity monitoring	4	The Food Standards Agency's annual RIFE (Radioactivity In Food and the Environment) report details the results of regular radiological monitoring carried out to ensure that discharges of radioactivity do not result in unacceptable doses to the public. RIFE 13 relates to monitoring carried out in 2007. From this report it is possible to extract the following conclusions: • water, sediment, beach and terrestrial and marine food and animal samples were collected from around the Hinkley site in 2007 • analysis of tritium, carbon-14 and sulphur-35 in milk, crops and fruit generally showed low concentrations of artificial radionuclides although some sulphur-35 and carbon-14 samples were slightly raised • concentrations of radioactivity in reservoir water were below the World Health Organisation's screening levels for drinking water	The dose limit for members of the public specified in The Ionising Radiation Regulations 1999 is 1 millisievert (mSv) per year for all artificial sources of radiation. Estimations of dosage levels to the public from the Hinkley sampling were as follows: • estimated dose from locally grown foodstuffs was less than 0.005 mSv • estimated dose to local fish and shellfish consumers was 0.029 mSv • the total dose from all sources, including direct radiation, was assessed as being less than 0.035 mSv	Trends in the data noted from sampling in previous years are as follows: • the estimated dose from locally grown foodstuffs is the same as it was in 2006 (less than 0.005 mSv) • there has been a slight reduction in assessed doses to seafood consumers since 2006 when the value was 0.040 mSv • the total assessed dose from all sources has reduced slightly from 0.048 mSv in 2006

Indicator	Data Source	Current Data	Comparators	Trend
		• reasonably high concentrations of tritium carbon-14 were detected in fish and shellfish but these were assigned to a local source unconnected with nuclear power plants • concentrations of certain artificial radionuclides in seafood, sediment, sand and seawater were elevated and represent the combined effect of a number of different radioactive sources in the area and elsewhere		
Health related to nuclear installations	5	There has been, since 1966, a nuclear power station operating on the Hinkley site. There are, therefore, historical data which can be analysed to correlate the incidence of disease reported around this site so that it can be compared to the average prevalence of the same disease in the British population as a whole. Such a comparison for childhood leukaemia, non-Hodgkin lymphoma and other malignant tumours was undertaken by the Committee on Medical Aspects of Radiation in the Environment (COMARE) in 2005. The results of this study for Hinkley are as below: • actual cases of childhood leukaemia and non-Hodgkin lymphoma between 1969 and 1993 in a 25km area around the plant were 67 • actual cases of childhood solid tumours between 1969 and 1993	For comparison purposes, the figures derived using statistics for Britain as a whole are as follows: • the expected number of cases of childhood leukaemia and non-Hodgkin lymphoma between 1969 and 1993 in a 25km area around the plant should have been 65.32 • the expected number of cases of childhood tumours between 1969 and 1993 in a 25km area around the plant should have been 101.33 It was concluded, from the above statistics, that there was no evidence of excess numbers of these cases in the 25 km area which would include either primary exposure to radioactive discharges or secondary exposure from re-suspended material.	

Indicator	Data Source	Current Data	Comparators	Trend
		in a 25km area around the plant were 99		

Key to Data Sources

1	Office of National Statistics on the web at: http://neighbourhood.statistics.gov.uk/dissemination/home.do;jessionid=ac1f930c30d607c6170cbe3146ada704c9cac1978fc7?m=0&s=1236174480737&enc=1&bhcp=1&nsjs=true&nsck=true&nssvg=false&nswid=996
2	Department of Communities and Local Government, Indices of Deprivation on the web at: http://www.communities.gov.uk/communities/neighbourhoodrenewal/deprivation/deprivation07/
3	NHS 'Find Services' on the web at: http://www.nhs.uk/servicedirectories/Pages/ServiceSearch.aspx
4	Food Standards Agency, Radioactivity In Food and the Environment (RIFE) report (2007) on the web at: http://www.food.gov.uk/science/surveillance/radiosurv/rife13
5	Committee on Medical Aspects of Radiation in the Environment (COMARE) (2005). Tenth Report. The incidence of childhood cancer around nuclear installations in Great Britain. Health Protection Agency, June 2005. http://www.comare.org.uk/comare_docs.htm

Cultural Heritage

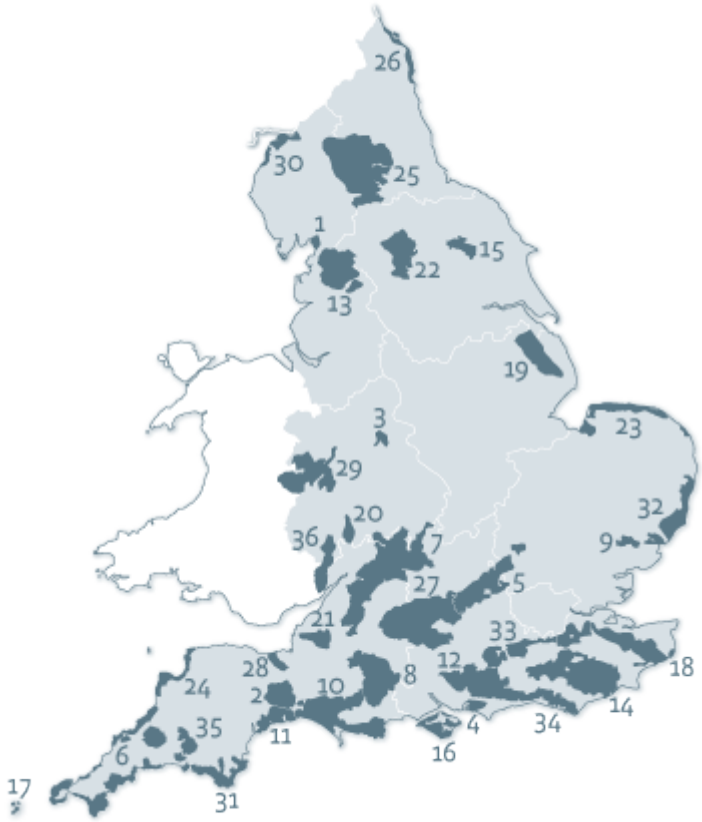
Indicator	Data Source	Current Data	Comparators	Trend
Topic: Cultural Heritage				
West Somerset's Historic Heritage	1	**West Somerset**		
		Listed Buildings	1,234	
		Scheduled Monuments	197	
		Historic Parks and Gardens	5	
Historic Environment	2	The most significant archaeological features identified in the Severn Estuary Rapid Coastal Zone Assessment are the numerous coastal fish weirs and traps located in the intertidal zone of Bridgwater and Blue Anchor Bays, dating from the 10th century period to the 20th century.		

Key to Data Sources

1	English Heritage. Heritage Counts South West 2008. http://www.english-heritage.org.uk/hc/server/show/nav.10741 [accessed 13 February 2009]
2	English Heritage, Severn Estuary RCZAS NMP. http://www.english-heritage.org.uk/server/show/nav.10757 [accessed 26 January 2009]

Landscape

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Landscape				
National Character Area (NCA)	1	Hinkley Point is situated within the Vale of Taunton and Quantock Fringes NCA. Key Characteristics: • Lowland farmland qualities in sharp contrast to surrounding upland landscapes. • Lowland, mixed farming landscape, with dense hedges, sparse woodland and frequent settlement. • Contrast between floodplain, low clay vale and higher sandstone vale edge. • Scattered settlement of farmsteads and hamlets linked by winding lanes. • Scattered villages. • Red sandstone buildings and prominent Perpendicular church towers. • Cider apple orchards. • Variable hedgerow tree cover, with some areas of abundant hedgerow oaks. • Willows on floodplains. • Open and windswept coast with low cliffs. Surrounding NCA's within West Somerset include: • Somerset levels and Moors/Mid Somerset Hills • Quantock Hills • Exmoor		

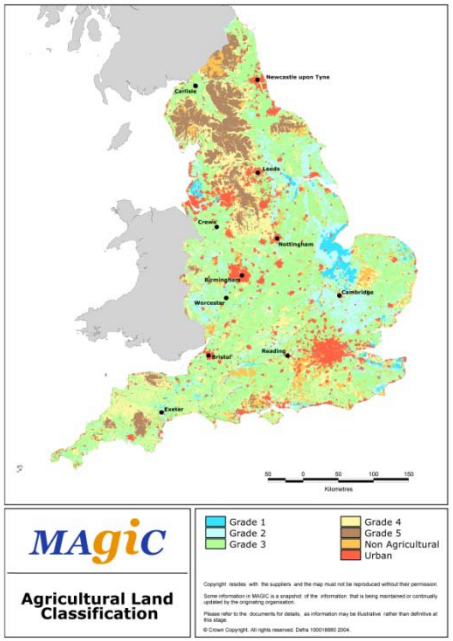
Indicator	Data Source	Current Data	Comparators	Trend
Areas of Outstanding Natural Beauty	2	 **Area of Outstanding Natural Beauty – England.** 21 - Mendip Hills 18km to the east 28 - Quantock Hills 4km to the west		

Indicator	Data Source	Current Data	Comparators	Trend
Relevant Local and Non-Statutory Desig-nations and Policies	3	The Quantock Hills Area of Outstanding Natural Beauty Management Plan has relevant objectives referring to the impacts of development and increased traffic outside the AONB boundary West Somerset District Local Plan Policy Vision and Strategy related to Protection of Natural Environment Policy LC/2 Effects on the Quantock AONB Policy SP/5 Development outside Settlement Boundaries Policy LC/3 Protection andConservation of Landscape Character (Replaced Special Landscape Area policy) Policy TW/1 andTW/2 Protection of Trees and woodlands Policy Co/2 and Co/3 Design and development affecting the natural environment on the coast Policy Co/4 Design of Coastal Defences Sedgemoor Local Plan CEN2 Protection of landscape Character CEN17 Protection of landscape character CCW Register of Landscapes of Outstanding Historic Interest Ref number: HLW (Gt) 2, Gwent Levels Landscape of Outstanding Historic Interest, 30km from the nominated site across the Bristol Channel CCW Register of Heritage Coasts Glamorgan Heritage Coast, 25km from the nominated site across the Bristol Channel		

Key to Data Sources

1	Natural England. Landscape Character Areas - Vale of Taunton and Quantock Fringes. http://www.naturalengland.org.uk/Images/jca146valeoftauntonandquantockfringestcm2-21223_tcm6-5615.pdf [accessed 13 February 2009]
2	Natural England. Areas of Outstanding Natural Beauty. http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/aonb/default.aspx [accessed 26 January 2009]
3	The Quantocks Area of Outstanding Natural Beauty Current Management Plan The Adopted West Somerset District Plan 2006 and Sedgemoor District Local Plan 1991-2011 CCW Register of Landscapes of Outstanding Historic Interest. http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/historic-landscapes.aspx [accessed 10 August 2010] CCW Register of Heritage Coasts. http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-landscapes--sites/protected-landscapes/heritage-coasts.aspx [accessed 10 August 2010]

Soils, Geology and Land Use

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Soils				
Agricultural Land Classif-ication **Soils**	2	Please refer to the map. The Magic map produced by DEFRA in 2004 indicates the current agricultural grade of lands in England and Wales. These grades are Agricultural land classification Grades 1-5, non-agricultural and Urban. The majority of West Somerset is classed as Grade 3 agricultural land, with Hinkley Point being located on Grade 3-4 agricultural land, which is not of high value. The soils are noted to be of a slowly permeable, calcareous, clayey nature. No mineral abstraction sites have been identified locally. British Geological Society (BGS) has assessed geological risks in the local area, which include: • Potential for Shrinking or Swelling Clay Ground Stability Hazard – very low risk • Potential for Landslide Ground Stability Hazards - very low to low risk		
Topic: Geology				
Geological SSSIs	1	There is one geological SSSI within 5 km of Hinkley Point. Blue Anchor to Lilstock Coast SSSI is approx 1.6 km from Hinkley Point and covers an area of 742.8 ha.		
Geology and Land Quality	2	Hinkley Point lies on the southern margin of the Bristol Channel sedimentary basin. Rocks of the Devonian and Carboniferous age are exposed in the Quantock Hills in the south west and to the north. To the east, the Lower Lias cliff line gives way to the flat low-lying ground of the River Parrett estuary and Somerset Levels. The land use surrounding the existing power stations is primarily farmland and		

Indicator	Data Source	Current Data	Comparators	Trend
		moorland. A small sewage treatment works is located to the south of the existing nuclear power stations. There is an historical landfill site located at the eastern section of the nominated site, referred to as Hinkley Point Power Station Landfill. This landfill ceased operation in 1990. The waste types received included inert and special (hazardous waste). There are also two historical landfills located to the northeast and southeast of the nominated site. In addition, an active Registered Waste Transfer site to the southeast of the Hinkley Point site is operated as part of the existing power station.		

Key to Data Sources

1	Natural England. Nature on the Map - Geological Sites Map. http://www.natureonthemap.org.uk/map.aspx?m=geology [accessed 03 March 2009]
2	Envirocheck Report for the Hinkley Point Site, Landmark Information Group

Water Quality and Resources

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Water				
Current State of the Waters in the South West River Basin District	1, 2	In the South West (SW) River Basin District (RBD), 24 % of rivers (by length) meet the requirements for good status or good potential. A greater number of groundwater bodies (82 % by number) meet the requirements for good status, while 48 % of estuaries and transitional and coastal waters meet the requirements for good status or good potential. Only 23 % of lakes meet the requirements for good status or good potential. The South West RBD River Basin Management Plan (RBMP) predicts that by 2015, 32 % of rivers will reach good status or good potential. However, in the South and West Somerset catchment, of the 1,100 km of rivers, currently only 80 km achieves good status. The main elements contributing to the less than good status are, in order, phosphate, fish, dissolved oxygen, diatoms and invertebrates. In addition, over half the rivers in this catchment have been identified as candidate heavily modified or artificial water bodies – the highest proportion in any catchment in the South West. The SW RBD has over 1000 km of coastline, 500 km^2 of estuaries, 187 designated bathing waters (~40 % of the total for England and Wales), 33 designated shellfish waters as well as many important marine species and habitats – all vital to the region's economy. A number of estuaries have failed good status because of elevated levels of Nitrogen in the water which can lead to algal blooms and other ecological impacts. Bathing water quality dropped in the South West after 2008 after a very wet summer. Shellfish waters are less affected. Groundwater is an important resource in the SW RBD, as the majority of the drinking water comes from groundwater. Hence it is vital that these sources are maintained for the future. The main pressures on groundwaters are abstraction for drinking water supply and contamination with nitrates and pesticides. In the West, historic mining has a significant influence of groundwater quality. Fifteen of the groundwaters in the SW RBD are at less than good status as a result of surface water flows they support being affected by lowered groundwater levels. Eight fail drinking water standards, while the remainder fail on quality, water balance or a combination of the aforementioned factors. Local information for the area around Hinkley Point from the Environment Agency (EA) web site relevant to Water Framework Directive (WFD) is summarised in the table below:		

<table>
<tr><th>Indicator</th><th>Data Source</th><th>Current Data</th><th>Comparators</th><th>Trend</th></tr>
<tr><td></td><td></td><td colspan="3">
<table>
<tr><th rowspan="2">Sector</th><th colspan="2">Ecological Quality</th><th colspan="2">Chemical Quality</th></tr>
<tr><th>Current</th><th>Predicted 2015</th><th>Current</th><th>Predicted 2015</th></tr>
<tr><td>Rivers: Stogursey Brook</td><td>Moderate</td><td>Not Assessed</td><td>Not Assessed</td><td>Not Assessed</td></tr>
<tr><td>Groundwater</td><td>Not Present</td><td>Not Present</td><td>Not Present</td><td>Not Present</td></tr>
<tr><td>Estuary</td><td>Moderate</td><td>Moderate</td><td>High</td><td>Good</td></tr>
<tr><td>Coastal</td><td>Moderate</td><td>Moderate</td><td>High</td><td>Good</td></tr>
</table>

The Stogursey Brook currently has moderate ecological water quality. The chemical water quality of the Stogursey Brook has not been assessed. The predicted ecological and chemical quality in 2015 has not been assessed by the EA. A major aquifer is not present at the site and groundwater quality has not been assessed.

The divide between the River Severn estuary and coastal water occurs at the location of the existing site. The ecological quality of both the estuary and coastal waters is assessed as moderate both at present and predicted in 2015.

The chemical quality of both the estuary and coastal waters is assessed as high at present and good as predicted in 2015.

As a major aquifer is not present at the site, groundwater quality and availability has not been assessed. There is no groundwater source protection zone located in close vicinity to the site.
</td></tr>
<tr><td>Catch-ment Abst-raction Manag-ement Strategies</td><td>5, 6</td><td colspan="3">Hinkley Point is located within the West Somerset Streams Catchment Management Abstraction Strategy, prepared in March 2007. Hinkley Point is located at the very eastern edge of WRMU7 Kilve. WRMU7 resource availability status is classed as water available.

The Severn Estuary is internationally recognised for nature conservation; it is designated as a Special Protection Area (SPA), Ramsar site and Special Area of Conservation (SAC). In addition to the Severn Estuary designated sites, the West Somerset Streams CAMS notes the Bridgwater Bay SSSI amongst the local designated sites which may affect water availability. In addition,</td></tr>
</table>

Indicator	Data Source	Current Data	Comparators	Trend
		although not listed specifically in the CAMS, the River Usk SAC and River Wye SAC have hydrological connections to the Severn Estuary designations. The Stogursey Brook to the south of Hinkley Point is located within the Parret Catchment Management Abstraction Strategy, prepared in March 2006. A catchment of Stogursey Brook is shown within an area that has not been assessed.		
Water Demand and Availability Projected to 2024	3, 4	The assessment of demand and supply occurs at the level of a Water Resource Zone (WRZ). A WRZ is defined by the Environment Agency (EA) as 'the largest possible zone in which all resources, including external transfers, can be shared and hence the zone in which all customers experience the same risk of supply failure from a resource shortfall'. Hinkley Point is located Wessex Water's 'West' WRZ. Forecasts for the Wessex Water supply area are that the 'normal year' per captia demand for unmetered households is expected to remain broadly stable at 151 lites per person per day (pppd) over the next decade, after which demand will decrease to 144 litres pppd. For metered households, average demand is forecast to decline from 137 to 135 litres pppd. For 'dry years', the forecast for metered and unmetered household demand is 5.2 % greater than for a 'normal year' (i.e. 7-8 litres higher pppd). By 2035, it is forecast that 'peak week' demand will become 64 % greater than 'normal' for metered households and 59 % greater than 'normal' for unmetered households. The Regional Assembly's Regional Spatial Strategy (RSS) for the south west predicts that 5,400 new homes will be built in the Wessex Water supply area, with the highest rate of growth occurring in the 'North' and 'West' WRZs. This will result in a population growth rate of slighly less than 0.8 % per annum. This figure masks the slightly higher growth rate expected in the 'West' WRZ. Non-household demand has been declining in the Wessex Water supply area, and accounts for 40 % of the total water supplied. The forecast for all commerical sectors (i.e. utilities, tourism, services, manufacturing, government, agriculture, construction and 'other') during a 'normal' year is		Total abstractions have fluctuated year on year in the EA's SW region. However, there has been a general decline of 16 % between 1995 and 2004 (from 6,629 to 5,547 M/ld). This goes against the national trend, which shows an increase of 5 % during the same period. Demand in the region has remained fairly stable since 2000 but is predicted to increase by around 5 % over the next 20 years.

Indicator	Data Source	Current Data	Comparators	Trend
		predicted to decline to 2035, dry year demand is forecast to be 4 % higher than a 'normal' year, while 'peak week' water demand is expected to be 19.6 % greater than a 'normal' year. There is no expected increase in these factors through time. Seventy five percent of the water supplied by Wessex Water comes from groundwater sources; the yield from a third of these sources is not dependent on groundwater levels in the boreholes, and is therefore unlikely to be constrained by the 1 in 30 year drought (1975/76 drought used as the benchmark). The yield of the remaining two thirds of the groundwater sources is limited by groundwater levels, while abstraction from four sources (Chitterne, Ivyfields, Lacock and Goodshill) is believed to have a significant effect on groundwater levels. The remaining supply is delivered from surface water sources and imports of water from neighbouring water companies. However, it is instructive to note that for the 'West' WRZ, the yield from groundwater sources is <15 Ml/d, while from surface water sources the yield is >90 Ml/d. The 'West' WRZ also receives imports of water from Bristol Water (0.28 Ml/d and 0.82 Ml/d) and from South West Water (0.002 Ml/d). It is predicted that the 'West' WRZ surface water yields will decline by 2.12 Ml/d by 2025 due to the effects of climate change. There are no water supply deficits in the 'West' WRZ.		
Sensitive Areas – Urban Waste Water Directive	7,8	There are no identified Shellfish Waters in close proximity to the site. The nearest identified Bathing Waters are at Burnham Jetty and Berrow to the east, and at Blue Anchor West to the west. There are also Eutrophic Waters identified in the Rivers Brue, Sheppey and Alham catchment which discharges into the sea at Burnham. There are no identified Shellfish Waters or Bathing Waters on the opposite bank of this reach of the Bristol Channel (the area covered by EA Wales).		

Indicator	Data Source	Current Data	Comparators	Trend
Coastal Processes and Sediments		Hinkley Point is situated on a rock platform with an extensive rock outcrop in front of the site and towards the east within the inter-tidal zone. The rock outcrop offers a measure of protection from erosion by tidal currents and storms. The shale beds within the mudstone formation offer little resistance to erosion and the cliff line and shoreline show evidence of active erosion. The cliffs are heavily protected by sea defences but Hinkley Point is exposed to tidal and wave action within the Bristol Channel and is being actively eroded. The Severn Estuary has the second highest tidal range in the world. Locally, the tidal range increases eastwards as far as Hinkley Point, where the highest recorded ranges have been up to 15m. Adverse weather conditions can raise water levels by more than 2m above predicted levels and the low-lying coasts on the southern side of the Bristol Channel are particularly vulnerable due to the very high tidal range. The tidal currents in the Bristol Channel generally exceed 1.5 m/s at spring tides for long periods and over wide areas. At times, a tidal bore forms in the Severn Estuary which can be up to 2m high. The shoreline is subject to strong winds, powerful waves and substantial storm surges. The general geomorphological context is one of on-going marine transgression with the inner Bristol Channel undergoing enlargement. The rate of marine transgression is very uncertain, however, but an advance (of the estuary) north eastwards along the Severn Vale of up to the order of 20km over the last few millennia may give some indication of change. This process can only accelerate as sea level rises into the future, putting increased pressure on the existing embankments and other defences. In a highly dynamic environment such as the Bristol Channel, the strong tidal currents ensure that sediment is permanently in suspension. Sand is carried in suspension with the flood and ebb motion of the tide. Convergences or divergences of this transport will cause accretion and		

Indicator	Data Source	Current Data	Comparators	Trend
		erosion respectively. This is one of the primary mechanisms for shoreline erosion.		

Key to Data Sources

1	Environment Agency (2007) Draft River Basin Management Plans: Current State of Waters.[19] http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/southwest/Intro.aspx
2	Defra (December 2008). Environmental Statistics, The Environment in your Pocket 2008 . http://www.defra.gov.uk/environment/statistics/eiyp/pdf/eiyp2008.pdf [accessed 19 January 2009]
3	South West Observatory (2008). State of the South West 2008. http://www.swo.org.uk/information-publications/state-of-the-south-west/) [accessed 13 February 2009]
4	Wessex Water Services Ltd (May 2008). Water Resources Management Plan, Draft for Consultation. http://www.wessexwater.co.uk/water-and-sewerage/threecol.aspx?id=578 [accessed February 2009]
5	Environment Agency (March 2007). West Somerset Streams Catchment Management Abstraction Strategy. http://publications.environment-agency.gov.uk/pdf/GESW0307BMAW-e-e.pdf?lang=_e [accessed February 2009]
6	Environment Agency (March 2006). Parret Catchment Management Abstraction Strategy. http://publications.environment-agency.gov.uk/pdf/GESW0306BKMY-e-e.pdf?lang=_e [accessed February 2009]
7	Urban Waste Water Treatment Directive Sensitive Areas; South West Region http://webarchive.nationalarchives.gov.uk/20080305115859/http://www.defra.gov.uk/environment/water/quality/uwwtd/sensarea/pdf/sensarea-swest.pdf
8	Urban Waste Water Treatment Directive Sensitive Areas; Wales http://webarchive.nationalarchives.gov.uk/20080305115859/http://www.defra.gov.uk/environment/water/quality/uwwtd/sensarea/pdf/sensarea-wales.pdf

[19] The data used in this assessment are taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time of writing. Draft plans were presented to the Government for approval in September 2009 and were subsequently published in December 2009.

Flood Risk

Indicator		Data Source	Current Data	Comparators	Trend
Topic: Flood Risk					
Flood Risk	1, 2		The site is located in Flood Zone 3, meaning it has a high probability of tidal flooding (1/200 or greater annual probability of flooding in >0.5 % in any one year. The site is currently protected by existing defences which afford a standard of protection of 1/200 years, the current condition grade of these defences is unknown. The nominated site area is covered in the West Somerset Strategic Flood Risk Assessment and Shoreline Management Plan. The draft policy in North Devon and Somerset's SMP2 for this policy unit is to 'hold the line', i.e. maintain the line of the existing defences (this is the same as the policy for management of coastal defences in SMP1). Map available separately.		Flood risk is expected to increase in the UK due to the predicted changes in climate leading to more intense rainfall events, wetter winters, rising sea levels and coastal erosion. Scenarios of climate change for the UK were published by the United Kingdom Climate Impacts Programme (UKCIP) in 1998 and 2002. 'The Climate of the UK and Recent Trends 2008' by the Met Office, provided the following general comments in relation to trends in climate change and how this might affect flood risk: • Global sea level rise has accelerated between mid 19th century and mid 20th century and is now about 3mm per year • All regions in the UK have experienced an increase over the past 45 years in the contribution to winter rainfall from heavy precipitation events; in summer all regions except North East England and North Scotland show decreases • Sea level rise around the UK rose by about 1mm/per year in the 20th century, corrected for land movement. The rate for the 1990s and 2000s has been higher

Indicator		Data Source	Current Data	Comparators	Trend
					than this Most recently in June 2009, UKCIP launched the latest UK Climate Change Predictions 2009 (UKCP09). These give information about climate change but not directly about flood risk. The key findings on climate change confirm the trends highlighted in the 2008 report and suggest: • All areas of the UK get warmer, and the warming is greater in summer than in winter. • There is little change in the amount of precipitation that falls annually, but it is likely that more of it will fall in the winter, with drier summers for much of the UK. • Sea levels rise and the rise is greater in the south of the UK than in the north.

Key to Data Sources

1	Environment Agency Flood Map (online). http://maps.environment-agency.gov.uk/wiyby/wiybyController [accessed 26th February 2009]
2	North Devon and Somerset Coastal Authorities Group, Hartland Point to Anchor Head SMP2 http://www.ndascag.org/Policy%20Options_ScenariostoTest.pdf [accessed 26th February 2009]

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