DEPARTMENT OF ENERGY & CLIMATE CHANGE

Appendices to the Appraisal of Sustainability Site Report for Hartlepool

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 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 Hartlepool. 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.

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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 as being 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 as being of national/ international significance.	**Likelihood**	
--	Major Significant	Problematical because of known sustainability issues; mitigation or negotiation difficult and/ or expensive. Effect considered as being 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 the degradation of air quality – both local and transboundary?

Potential Receptors:

- Local populations and wider regional population (human health)
- Sensitive habitats, including Teesmouth and Cleveland Coast National Nature Reserve, SPA and Ramsar site; Saltholme RSPB reserve; and 7 No. SSSIs (Tees and Hartlepool Foreshore and Wetlands; Seaton Dunes and Common; South Gare and Coatham Sands; Seal Sands; Cowpen Marsh; Hartlepool Submerged Forest; and Redcar Rocks).

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 consents/permits (possibly similar in nature to those the existing nuclear power station currently operates under) and management techniques during construction, operation and decommissioning stages.

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 Middlesbrough and Darlington conurbations due to the prevailing wind direction (southwest to westerly). 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. There is however an opportunity to employ any lessons learned from the planned decommissioning of the existing nuclear power station at Hartlepool.

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

4. Air quality in the North East region of England is generally good. The combined air quality indicator, used to compare the English regions, places the North East as the third best region in the UK. No Air Quality Management Areas (AQMAs) are located within the vicinity of the site. The effect on air quality from the construction, operation and decommissioning of the nuclear power station is not likely to be significant, provided construction and operation is in accordance with regulatory/consenting regimes and current good practice.

5. As with any major infrastructure project, the emission of pollutants to the atmosphere associated with increased traffic movements in the vicinity of the development (construction site traffic etc) 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 alongside local environmental health practitioners and 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.

6. It is unlikely that the development project will lead to the designation of any new AQMAs in the region due to the duration of construction activities.

7. The release of radioactive emissions from the site will be governed by HSE and the environmental regulator through the development of appropriate emission limits, as part of the permit under the Environmental Permitting (England and Wales) Regulations 2010. This will be specific to the reactor type being used, alongside the siting and sensitivity of the receiving environment.

8. 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.

Mitigation and Monitoring Possibilities

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

Air Quality	
• 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.	process.

Biodiversity and Ecosystem

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:

Teesmouth and Cleveland Coast SPA – the northern part of the site is within the boundary of the SPA.
Teesmouth and Cleveland Coast Ramsar – the northern part of the site is within the boundary of the Ramsar.
Durham Coast SAC – approximately 11km to the north of the site.
Northumbria Coast SPA – located approximately 11km to the north of the site, with its southern-most limit at Seaham.
Northumbria Coast Ramsar – approximately 11km to the north of the site.
North York Moors SAC – approximately 15km of the site.
North York Morrs SPA - approximately 15km of the site.
Castle Eden Dene SAC - approximately 15km of the site.

The following SSSI's are within 5km of the site and form component parts of the Teeside and Cleeveland Coast SPA/Ramsar designated areas:

- Seal Sands SSSI – adjacent to the south of the site.
- Seaton Dunes and Common SSSI – adjacent to the north and east of the site.

Biodiversity and Ecosystem

- Tees and Hartlepool Foreshore and Wetlands SSSI – approximately 5km to the south of the site.
- Cowpen Marsh SSSI – approximately 1.5km to the south-west of the site.
- South Gare and Coatham Sands – approximately 1.5km to the east of the site on the other side of the Estuary.
- Redcar Rocks SSSI – approximately 5km south east of the site.
- Durham Coast SSSI – approximately 5km north of the site.
- Hartlepool Submerged Forest SSSI - on the foreshore at Hartlepool (of geological (and archaeological) conservation importance)

Habitats considered to be potential receptors are as follows:

- Estuaries (which contain a number of UK BAP priority habitats such as, intertidal sandflats and mudflats, saltmarsh and shallow coastal waters).
- Reedbeds.
- Coastal and Floodplain Grazing Marsh.
- Maritime Cliff and Slope.
- Coastal Sand Dunes.
- Sand and Shingle.

Species which may be potential receptors are as follows:

- Breeding birds.
- Passage and over-wintering waders and waterfowl.
- Grey and Common seal.
- Rare and uncommon plants.
- Nationally important invertebrate species.
- Common Species of Reptile.
- Otters.
- Water Voles.
- Bats.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

Disturbance (noise, light and visual)

Biodiversity and Ecosystem

1. Potential significant effects may arise due to disturbance from construction activities (duration 5-6 years), increased vehicular movements, machinery, earthworks and excavations, an increase in lighting and increased personnel presence on the site. Similar impacts could also occur during decommissioning. This could have an adverse impact on fauna, particularly the important bird assemblages of the Teesmouth and Cleveland Coast SPA/Ramsar and Northumbria Coast SPA/Ramsar. Birds may be deterred from utilising key roosting/feeding areas which could result in displacement and impact on their chances of survival.

2. The nominator will need to assess the potential for disturbance effects on fauna (in particular birds within the designated areas) and devise appropriate mitigation to avoid or minimise such effects.

Loss, damage and fragmentation of important habitats

3. Construction activities, earthworks and excavations and provision of new buildings and infrastructure could all result in the direct loss, damage, reduction, alteration or fragmentation of important habitats such as primary interest habitats within the Teesmouth and Cleveland Coast SPA/Ramsar and/or Biodiversity Action Plan Habitats (for example. habitats such as Saltmarsh, Mudflat, Coastal Sand Dunes, Coastal Floodplain and Grazing Marsh).

4. In addition, development and physical structures such as flood defences which may be required to reduce flood risk can disrupt the natural estuarine and coastal processes resulting in loss of estuarine habitats both in the immediate locality and in a wider context.

5. Important species (for example legally protected species/UK BAP species) which utilise such habitats will also be affected for example through loss of feeding grounds, roosting or resting places, severance of commuting/wildlife corridors and through food chain impacts such as loss of food sources and prey items.

6. Populations of Little Tern, Sandwich Tern, (Red) Knot and Redshank are all qualifying species of the Teesmouth and Cleveland Coast SPA and therefore adverse impacts will arise if any habitats used by these species are lost.

7. Potential impacts on important habitats/species will need to be investigated further (both the site level and within the wider area). Mitigation will need to avoid or minimise any loss with appropriate measures defined in the nominator's proposals and Environmental Impact Assessment (EIA). Further site level surveys would be required to determine a baseline for the prediction of the effects of developing the site on any habitats/species so that suitable mitigation measures can be implemented.

Discharge of heated water

8. Discharge of heated water into water bodies can impact upon aquatic ecosystems due to the temperature of the water being up to 10°C warmer.

Biodiversity and Ecosystem

Teesmouth and Cleveland Coast SPA/Ramsar site and associated SSSIs are in close proximity to the site and therefore any discharge of heated water into the intertidal could have an adverse impact on the habitats and species for which these sites are designated for example oxygen is less soluble in water at higher temperatures and a reduction in dissolved oxygen can put aquatic life under stress. Any loss of habitats/plants or invertebrates could in turn have an impact on species such as waterfowl which rely on such sources for feeding.

9. Further studies will be required by the nominator to assess the effects of discharged heated water on aquatic ecology especially any effects which could impact on the Teesmouth and Cleveland Coast SPA /Ramsar site and associated SSSIs.

10. Discharges of heated water from a new power station would be released in addition to that from the existing power station for its remaining operational lifetime. The impact of cumulative discharges is not known.

Abstraction of water for cooling purposes or site needs

11. Water intake from surface water bodies can lead to the incidental mortality of fish and other aquatic species. Fish, larvae and eggs can be sucked into condenser circuits and be subjected to heat before being returned to the sea. The Teesmouth and Cleveland Coast SPA /Ramsar site and associated SSSIs are in close proximity to the site. Any loss of fish or invertebrate food sources could have an adverse impact on species such as the important bird assemblages for which the SPA/Ramsar site in particular is designated. A suitable intake system design should be adopted to avoid any significant ecological impacts.

12. Groundwater abstractions may affect groundwater supply to other areas of valuable habitat. This could result in habitat degradation. Cowpen Marsh SSSI falls approximately 5km from the site and is designated for its coastal grazing marshland. Changes in local hydrology could affect such habitats, and the effects in the local hydrology could impact as far as the North York Moor SAC.

13. Further hydrological studies will be required by the nominator to assess the effects of any proposed water abstraction on ecology, particularly aquatic habitats and/or areas of valuable habitat which may be vulnerable to groundwater abstraction and any effects which could impact on the Teesmouth and Cleveland Coast SPA /Ramsar site and associated SSSIs.

Routine releases of radioactive discharges to water

14. Routine radioactive discharges to the aquatic environment may have a negative impact on both terrestrial and aquatic ecology. Depending on dosage, lethal, genetic or reproductive effects may result. Radionuclides may also accumulate in organisms such as invertebrates and plants which could have both direct and indirect effects to the food chain, in particular on the Teesmouth and Cleveland Coast SPA /Ramsar site and associated SSSIs and NNRs and their interest features such as the important bird assemblages and breeding/visiting seals.

Biodiversity and Ecosystem

15. Bioaccumulation of such toxins in food chains could also have an indirect impact on the southern section of the Northumbria Coast SPA and Ramsar sites. Despite these designations being approximately 8km from the site, one of the key reasons for designation of these sites, the Little Tern, is known to feed and forage over shallow inshore waters. Any potential impacts on this bird for example. through accumulation of toxins in the food chain, would therefore have an indirect impact on these designations.

16. Further studies will be required to understand fully the extent and likely significance of effects on ecology of any proposals for radioactive discharges from the site. Any new nuclear power stations would require a permit from the relevant environment agency under the Environmental Permitting (England and Wales) Regulations 2010 before making any discharges of radioactivity and regular water quality monitoring will be required.

Unplanned release of radiation/accidental pollution from water treatment plants

17. There is a very small risk of accidental release of radiation (either through the air, water or soil) into the environment which could affect aquatic or terrestrial fauna or flora associated with the Teesmouth and Cleveland Coast SPA /Ramsar site and associated SSSIs as well as biodiversity in the area as a whole. Such an event could occur during operation, interim radioactive waste storage, during decommissioning or during final transport of waste for disposal.

18. There is also the potential for accidental pollution of watercourses due to leaks or spillages from water treatment plants. This could cause toxic contamination of aquatic or terrestrial ecology. Given the proximity of Teesmouth and Cleveland Coast SPA /Ramsar site and associated SSSIs, key interest features of these designated sites could be impacted, for example contaminants could have lethal effects or sub-lethal effects on aquatic organisms impairing reproduction, physiology, genetics and health, or compounds could be bioaccumulated within tissues and could subsequently enter the food chain. This could impact on higher predators such as waterfowl and seals.

19. The operation of the site including waste storage, decommissioning activities and the transport of radioactive waste, will be 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 nuclear power station at Hartlepool. Further studies are likely to be required to assess the risks and potential effects of the occurrence of such events on the designated sites and on biodiversity in the wider area as a whole and regular monitoring of water quality will be required.

Regional/ Local

Air quality

20. The development of the site may affect air quality. In particular through construction activities (duration 5-6 years) and as a result of increased vehicular movements (both within the site itself and via increased traffic on access roads to and from the development). Increased vehicular emissions

Biodiversity and Ecosystem

and mobilisation of dust could both impact on the sensitive habitats of the Teesmouth and Cleveland Coast SPA/ Ramsar site and associated SSSIs as well as biodiversity in the general locality, particularly if the dust is of a different acidity to the surrounding habitats.

21. Further background environmental condition information and modelling is likely to be required in order to predict potential impacts of changes in air quality on biodiversity.

Drainage

22. New drainage systems on or within the site could result in adverse impacts on both terrestrial and aquatic habitats during both construction and operation. Installing new drainage systems could result in physical loss of habitats and new operating drainage systems may result in increased sediment loading of watercourses/estuarine habitats and altered run off rates. This could affect the hydrology and morphology of watercourses/estuarine habitats and could impact on aquatic flora and fauna. In addition, nutrient enrichment could alter the composition of habitats within aquatic ecosystems. In particular, Teesside and Cleveland Coast SPA and Ramsar sites and their interest features may be affected directly or indirectly by any changes to existing drainage.

23. Further hydrological studies will be required by the nominator to assess the effects of any drainage infrastructure required on ecology, particularly aquatic habitats and/or areas of valuable habitat associated with Teesside and Cleveland Coast SPA and Ramsar sites.

Materials Management

24. During construction, operation and decommissioning there is a risk of adverse impacts to flora and fauna through accidental pollution (for example spillages of oil, fuel or other contaminants) which could affect terrestrial or aquatic habitats and designated sites such as the Teesmouth and Cleveland Coast SPA /Ramsar site and associated SSSIs.

25. Further studies should be undertaken by the nominator to assess the effects of any pollution on local biodiversity. Good site environmental management practices should be put in place to minimise the above risks.

Local habitats and species

26. It is unknown at the present time what habitats and species are present at a more local level. Further site level studies will need to be undertaken by the nominator to determine a baseline for the predicting the effects of developing the site on habitats and species so that appropriate mitigation measures can be implemented.

Biodiversity and Ecosystem

Cumulative Effects

27. The area could be a focus for other high profile energy and other development projects, for example the Tees Barrage. The cumulative effects could be significant to overall impacts on biodiversity, for example the continued operation of the existing power station and then de-commissioning (existing power station due to operate until 2014). Cumulative impacts may occur during construction, particularly if construction phases overlap, with cumulative impacts on biodiversity from disturbance (noise, light, visual, traffic), emissions/dust, water quality (run-off). Operational cumulative impacts on biodiversity may include loss/fragmentation/damage of habitat, air quality impacts on terrestrial and aquatic habitats, water quality impacts on aquatic habitats, potential disturbance impacts etc.

Summary of Significant Strategic Effects:

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

Significant Effects	**Mitigation and Monitoring Possibilities**
• Noise, visual and light disturbance during construction on fauna such as legally protected species, in particular on important assemblages of birds within Natura 2000 sites.	• Further studies required to fully assess impacts. Avoid encroachment into sensitive areas through careful site design. Construction environmental management plan to minimise disturbance for example through timing/screening.
• Loss, damage or alteration, including fragmentation and coastal squeeze, of important habitats and subsequent disturbance to protected species due to new buildings and infrastructure, including the installation of cooling water infrastructure). Teesmouth and Cleveland Coast SPA/ Ramsar sites are of particular concern.	• Further studies required to assess impacts. Avoid and minimise loss through careful site layout and design. Habitat creation to replace lost habitats and maintain connectivity. Ecological mitigation and management plan adopted for the site.
• Discharge of heated water into aquatic habitats could alter ecosystems. Teesmouth and Cleveland Coast SPA/ Ramsar sites are of particular concern.	• Further studies required to fully assess impacts.

Biodiversity and Ecosystem	
• Abstraction of water for cooling purposes can lead to incidental mortality of fish and aquatic invertebrates. This could have knock-on effects on interest features (particulaly birds) of the Teesmouth and Cleveland Coast SPA/ Ramsar sites.	• Further hydrological studies required to assess impacts. A suitable intake system design should be adopted to minimise impacts.
• Alterations in local hydrology through groundwater abstraction can alter important habitats reliant on groundwater supplies, for example Grazing Marsh.	• Further studies required to fully assess impacts.
• Routine releases of radiactive discharges into water could impact aquatic ecoystems either directly or indirectly for example through bioaccumulation of toxins within food chains. Impacts on the Teesmouth and Cleveland Coast SPA/ Ramsar sites are of particular concern.	• Further studies required. Avoid impacts through safe site operations. Regular monitoring of water quality.
• Accidental pollution for example leakage of radioactive waste or other chemical compounds. Risks present throughout construction, operation and decomissioning. Potential adverse impacts on biodiversity with Teesmouth and Cleveland Coast SPA /Ramsar sites being of particular concern.	• Further studies on potential impacts required. Avoid through safe operation, decommissioning and waste transfer. Regular monitoring of water quality.
• Reduction in air quality, particularly during construction due to increased dust and vehicle emissions. Potential impacts on biodiversity with Teesmouth and Cleveland Coast SPA/ Ramsar sites being of particular concern.	• Further studies needed to determine impact. Construction environmental management plan to minimise impacts.
• Cumulative effects of other high profile developments/plans in the area.	• Further studies needed to determine cumulative impacts.
• Construction and operation of new drainage infrastructure could impact on both terrestrial and coastal ecosystems. Hydrology and morphology of watercourses could be altered through increased sediment loading. Teesmouth and Cleveland Coast SPA/ Ramsar sites of particular concern.	• Further water quality studies required to determine impacts.
• Improper management of materials during constuction, operation and decomissioning could lead to contamination of soil, water and air through leakages/sills for example concrete, oil, fuel and other contaminants. This in turn could have adverse impacts on local biodiversity.	• Further studies required. Avoid through safe materials management practices, for example Environmental management plans.

Biodiversity and Ecosystem	
• Impacts of a new power plant on biodiversity at the more local level are currently unknown but any protected species/important habitats on site or close by could be impacted.	• Further studies required to determine impacts on habitats and species at the site level.

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 resulting from changes in:

- Transport of people and goods
- Scope, form and methods of asset construction, maintenance and demolition
- Waste recycling and disposal
- Land management practices
- Other secondary activities in the wider local and national economy

Note: Adaptation to climate change is discussed in other relevant topic appriasals, eg. biodiversity, water, flood risk.

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 due to this technology are independent of the site chosen. 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.

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. 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.

4. Construction and decommissioning activities will have both direct and indirect greenhouse gas emissions associated with them regardless of the location. A comparison of these construction and decommissiong related emissions to those of fossil-fuelled power plants will largely depend upon the

Climate Change

design parameters of the plants with the exception of specific sub-activities associated with nuclear fuel and nuclear wastes.

5. Other global, generic issues relating to vulnerability of nuclear power plants to climatic impacts such as sea level rise, most intense weather events and flooding are covered in other topics unless regionally or locally significant.

Regional/Local

6. The provision of a nuclear power station for energy generation at the site will make a positive contribution to future local and national climate change targets. The combination of nuclear power generation with increased investment in renewable energy sources will assist in reducing greenhouse gas emissions compared to no nuclear power facility option in the region.

7. The activities involved for the construction at the site 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, however, the location of the port needs to be identified to ensure the best option for transportation is utilised without extra carbon dioxide emissions. Another option for transportation to consider will be the use of the current rail infrastructure in place. 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.

8. 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.

9. 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.

10. The site is situated in a region more susceptible to the following compared to other regions, such as the South West.These susceptibilities are:

    - Average annual temperatures in the North East may rise by between 0.5 and 1°C from 2000 levels by the 2020s;
    - A very hot summer, as experienced in 2003 with the average August temperature 3.5°C above normal, may occur as often as 1 year in five by the 2050s;
    - The sea level along the Tees Valley coastline could rise by up to 20cm by 2020;
    - Winds are expected to increase in frequency and strength throughout the UK. An increase in wind speed of just 10% results in a rise in storm

Climate Change

damage insurance claims of 150%;

- Winters are expected to become wetter by around 4-6%, and summers drier by perhaps 7 to 10% across the North East by the 2020s;
- Extreme winter precipitation will become more frequent; and
- Depending on emissions scenario, winter snowfall is predicted to decrease by between 40-100% by the 2080s.

11. The site is located within the area controlled by Hartlepool Borough Council. Hartlepool Borough Council has partnered with four other local authoritiesm the Environment Agency, Renew tees Valley and Scottish Power to form the Tees Valley Climate Change Partnership to deliver the Tees Valley Climate Change Strategy. The Strategy has put in place a short and long term aims for carbon emission.

12. Based on the trends from Hartlepool Borough Council there has been a decline for Carbon Dioxide emissions from the Industrial and Commercial sector within the area, whilst emissions from other sectors (Housing, Transport, Waste and Major Industries) have remained fairly constant. The short-term reduction target is a 14% reduction from 2000 levels by 2012.

Summary of Significant Strategic Effects:

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

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. The cumulative benefits of a nuclear program for climate change are further discussed in the main AoS report.
- This site is particularly susceptible to the future impacts of climate change associated with sea level rise, flooding, coastal erosion and most intense weather events.
- The site specific features include an extensive sea, rail and road transport infrastructure due to the industrial and urban history of the Hartlepool area. The existence of a number of mixed-fuel system power generation plants in the area of Hartlepool could affect the assessments towards suitability of the site and the potential feasibility of the site in relation to transmisson and connectivity infrastructure.

Mitigation and Monitoring Possibilities

- The impacts during construction may be mitigated by selection of carbon-efficient forms of transport and construction. There is also the possibility of off-setting the emissions.
- The greenhouse gas emissions arising from construction and operation should be monitored to inform carbon reduction through the lifetime of the project.
- The current extensive transmission infrastructure needs to be monitored in relation to the operating life of the existing power stations in the area, particularly with

Climate Change	
• 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 to the low carbon energy output of the station. • 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.	regard to the phasing in of the site, with the prime aim of reducing greenhouse gas emissions.

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.

Regional/ Local

1. Short-medium term positive effects through creating new jobs for local and regional population. The quality and quantity of employment during the construction stages (approx 5-6 years) 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 minimum 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.

Communities: Population, Employment and Viability

2. The existing power station at the site is a significant local employer, employing over 700 full-time staff and contractors[1]. A new power station may assist in offsetting job-losses from the decommissioning of the existing power station at the site, which is due to cease power generation in 2014.

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). These will be of greater significance at the local level.

5. Some uncertainty is identified as the construction phase may affect the ability of other industries/projects to source labour. Problems related to construction labour/skills shortage have been identified in the North East[2], where the lack of suitably qualified and trained workers continues to impact upon the sector, with employers reporting difficulties in recruiting skilled labour.

6. Potential changes to the population dynamics of local communities may result in both positive and negative effects. Effects are dependent on the source of labour, for example from local community or from outside. Possible negative effects may arise during the construction stage as a temporary new community (construction labour) may not integrate with existing community. Longer term, new employees are likely to be drawn from a wide area, including local communities and the wider area generally up to 25 mile radius, resulting in less pressure on local services. Positive economic and social benefits are likely as the 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 surroundings.

[1] British Energy presentation. 3 June 2008. http://www.british-energy.com/documents/Hartlepool_Borough_Council_members_3-6-081.pdf

[2] Skills North East. http://www.skillsnortheast.co.uk/

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 positive with regard to the creation of temporary jobs during construction and permanent full-time employment during operation, although some uncertainty identified as the project may lead to a shortage of local construction workers to meet the needs of other industries and major projects.

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 construction 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
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

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

Hartlepool is generally well served by transport links. The A19(T) through the west of the borough provides a major north-south trunk road through the region connecting Hartlepool to Durham and Tyne and Wear to the north and the rest of the Tees Valley and North Yorkshire to the south. The A19(T) is connected to the main urban area of Hartlepool via the A689 and A179 principal roads. These roads also provide the major north-south road link for local trips within the town.

Traffic levels and congestion on the A66 east-west corridor are high at certain times of the day. Principal freight routes are the A689 and A179, in addition to the A1053(T) and A174(T). Future growth associated with regeneration are being taken forward in partnership with the Highways Agency

Communities: Supporting Infrastructure

Regional/ Local

1. 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.
2. Capacity of the regional infrastructure that exists at the particular lifecycle stage of the facility will need to be considered to ensure sufficient planning of the management of wastes generated. Implementation of current good practice and initiatives will assist in minimising impacts on existing waste facilities. Such initiatives include the preparation of a Construction Waste Management Plan during the construction stage, and sustainable waste management / minimization during operation.
3. As with the operation of any medium to large industrial facility, there is the potential for accidental releases of non-radiological, but hazardous, wastes (such as waste oils and lubricants) during the operational and decommissioning phase of the facility that can impact on habitats and species, including wintering birds, and migratory fish. It is anticipated any effects will be local however and not strategic: implementation of sustainable management techniques during these phases will reduce the risk of any such releases.
4. Operational waste (non-radiological), including those classed as hazardous (waste oils, lubricants etc) will have impacts upon the capacity of existing waste management services. Any such impacts are however not expected to be significant as it may be possible to utilize and extend the current arrangements for the existing Hartlepool nuclear facility.
5. It is not likely that significant impacts on the current waste management infrastructure will be caused by non-radiological wastes generated during the decommissioning phase of the facility. Best practice and statutory obligations at the time of the process shall be implemented to ensure a sustainable approach is taken to the management of the wastes generated and protect the wider environment (local air quality and amenity). There is however an opportunity to employ any lessons learned from the decommissioning of the currently operational Hartlepool Nuclear Power Station (anticipated operational period up to at least 2014).
6. Long term pressures and effects on the (non-radiological) waste management infrastructure are unlikely to be significant.
7. The development of a nuclear power station at Hartlepool 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.

Summary of Significant Strategic Effects:

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

Significant Effects	**Mitigation and Monitoring Possibilities**
• Potential for significant effects on strategic road infrastructure through increased congestion/ disruption of traffic. This may lead to increased congestion during	• Further studies will be required to assess in detail the effects on the strategic road network

Communities: Supporting Infrastructure	
construction, operation and decommissioning stages. • Potential for negative effects on local access road network due to transport of large loads during construction via minor country roads.	as well as local access roads. • 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 rail).

Human Health and Well-being

AoS Objective:
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.

Guide questions:
Will it adversely affect the health of its workforce or local communities through accidental radioactive discharges or exposure to radiation during construction, operation, decommissioning and interim storage of radioactive waste on the site.
Will it lead to unacceptable community disturbance during construction, operation or decommissioning?
Are there any particularly vulnerable local communities that could be affected?
Will it help to reduce any health inequalities?
Will local perceptions of risk associated with the proposed power station lead to adverse impacts on mental health for nearby communities?
Will it adversely affect the ability of an individual to enjoy and pursue a healthy lifestyle?

Potential Receptors:

- Temporary local and regional resident workforce during construction and decommissioning phases.
- Permanent and temporary workforce during site operational phase.
- Local and regional resident population, visiting tourists and recreational users.
- National and international resident 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 site to travel both nationally and internationally (for example to countries on the European continent). However, current radiological monitoring of the nuclear power station that has been operating on the Hartlepool site since 1983, suggests that the risk to the public is extremely low with total dosage from all sources (including direct radiation) estimated as being less than 2.5% 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

Human Health and Well-being

the UK population, and possibly citizens of other countries 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. Local and regional health risks: 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 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 Hartlepool 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[3], 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

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

Human Health and Well-being

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 Hartlepool. 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 site may put a strain on local health services as 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 the site 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 lived with the presence of an adjacent nuclear plant for more than twenty years so perception of risk is unlikely to be a problem at this location.

11. Community well-being: Hartlepool Borough Council is a deprived area with employment and health deprivation being particularly acute. The siting of a new nuclear power station at Hartlepool should help to alleviate this deprivation as more jobs will be created in the area leading to an increase in community wealth, additional housing and other associated neighbourhood infrastructure.

12. Community disturbance: The presence of, and more particularly the construction of, a nuclear power station at the site at Hartlepool 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.

13. Employment: Employment levels in the Hartlepool Borough Council area are low (67.5% from July 2007 to June 2008) compared to the rest of England

Human Health and Well-being

(74.5% from July 2007 to June 2008). As has been demonstrated[4], 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 the site 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 phase) and long term (operational and decommissioning phases) 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 Hartlepool 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 the site 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 an environmental construction 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.

[4] 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.
- Hartlepool Submerged Forest SSSI – on the foreshore of Hartlepool

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. The nearest scheduled monument consists of Claxton Medieval Moated site which lies c.5km to the west. A potential impact on its setting may arise from the development on the site.

2. Three Grade II* listed buildings are also present within 5km of the existing nuclear power station and site, and potential impacts on their settings may arise from the development. All setting issues will need to be addressed by the nominator at the project level stage.

3. Seaton Carew Protected Wreck Site lies approximately 2.5km to the north of the nominated site. There are potential effects on the wreck site from flood defence works.

Regional/ Local

4. The nearest Conservation Areas are Seaton Carew approximately 1.9km to the north, Greatham approximately 3km to the west and another in Hartlepool, approximately 5km to the north. There is a potential impact on their setting.

5. There are no listed buildings within or adjacent to the exisiting nuclear power station or the likely location for the site. However, there are 51 Grade II listed buildings within approximately 5km and there may be an impact on their settings.

Cultural Heritage

6. An area of historic landscape lies immediately north of the existing power station and there may be a physical impact if the nomination site is proposed for this area. There is likely to be a setting impact.

7. Archaeological sites in the form of 20th century military buildings are located adjacent to the existing power station. Layers of palaeo-environmental potential may also be present. The presence of these features indicate historic activity, spanning at least the 20th century, in the area immediately surrounding the existing facility. As such, the area is likely to be considered of at least local to regional archaeological importance. As a minimum, an archaeological watching brief will be required during construction, however, it is more likely that a detailed archaeological investigation of the area will be required, including intrusive investigation (for example trial trenching and detailed recording).

8. No impacts are likely during operation unless potential setting impacts on monuments in the wider vicinity cannot be mitigated against.

9. Impacts to the buried archaeological resource are possible during decommissioning as excavations are likely to be required. Reinstatement of the area following decommissioning is unlikely to mitigate for earlier impacts.

Summary of Significant Strategic Effects:

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

Significant Effects

- Main effects would be at a local scale, within the footprint of the proposed new facility. Effects would be permanent and irreversible.
- Immediately surrounding the site, there may be potential effects on the settings of historic assets. The significance will depend on distance, topography and the ability to mitigate.

Mitigation and Monitoring Possibilities

- 20th century military activity is evident within the existing facility and an unknown archaeological (buried) resource is potentially present. Further detailed investigations (field evaluation, trial trenching etc.) may be required prior to construction, with an excavation and/or watching brief required during the construction phase (during ground preparation and excavations).
- It may be possible to mitigate against potential adverse setting effects on heritage assets

Cultural Heritage	
	through appropriate landscaping/planting schemes. • Potential impacts from flood defence works on the Seaton Carew Protected Wreck Site should be avoided through appropriate siting of flood defence infrastructure

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 cause light pollution?

Potential Receptors:

- Potential receptors from public footpaths and trails within northern fringe of the North Yorkshire Moors NP near Rosebury Topping and from the designated Durham Heritage Coast and North Yorkshire & Cleveland Heritage Coasts.
- The landscape character of the Tees Lowlands NCA (23).

Landscape

- The landscape character of neighbouring NCAs including North Yorkshire Moors and Cleveland Hills (NCA 25), Vale of Mowbray (NCA 24), Pennine Dales Fringe (NCA 22), Durham Magnesium Limestone Plateau (NCA 15) and Durham Coalfield Pennine Fringe (NCA 16) landscapes.
- The visual amenity of local residents within the Greatham, Owton Manor and Seaton Carew, including Seaton Carew Conservation Area. Viewpoints from local amenities including the Seaton Carew and Cleveland golf club on the mouth of the river Tees estuary.
- Distinctive site landscape features within Landscape Character Types identified within the Hartlepool Borough Landscape Assessment (2000).
- The site is defined as moderate to least tranquil part of the county of Cleveland and does not fall within a CPRE dark skies area.

Note: Refer to Cultural Heritage assessment for consideration of the effects of the development on any scheduled ancient monuments, listed buildings or Conservation Areas that fall within 5km from the site.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. The site is likley to be visible from shipping lanes within the Tees Estuary and from the North Sea but would not be apparent beyond international boundaries.

2. The site is distant from nationally important designations including the North Yorkshire Moors National Park, and Durham and Cleveland Heritage Coasts. Due to the extensive industrial character that generally surrounds the mouth of the River Tees, the day and nightime visual amenity and landscape setting of the National Park and Heritage Coasts are not likely to be significantly affected by the development.

3. Higher ground is located near Rosebury Topping within the North Yorkshire Moors National Park, located approximately 18km to the south east of the proposed development. The site may be visible from this higher ground, but the visual impact is not likely to be siginificant given the distance of this receptor offered by this existing industrialised skyline. The site is likely to be more apparent from localised high points including Eston Hills approximatly 5km to the south.

4. The site is located to the north of the Tees estuary within the Tees Lowlands National Character Area (NCA 23). This distinctive landscape is described by Natural England as follows : 'The Teesside conurbation forms an extensive area of urban and industrial development which spreads around the margins of the Tees estuary as an almost continuous built-up area from Redcar to Billington, with Hartlepool as a discrete settlement to the north. High rise buildings, large scale chemical and oil refining works, dockside container terminals, a power station and other installations, all clustered on land reclaimed from the estuary of Teesmouth, form a distinctive and dramatic skyline which is highly visible across this low lying landscape by day and night.

Landscape

This extensive area of industry is starkly juxtaposed with natural elements of the Tees estuary, form a distintive and dramatic skyline which is highly visible across this low lying landscape by day and night'. It is considered that the proposed development at the site would appear consistent with this industrial character. However, there is the potential for enhancements to landscape character at a local level.

5. The site is located towards the centre of the Tees Lowlands NCA (23). Due to the distance of the outlying North Yorkshire Moors and Cleveland Hills (NCA 25), Vale of Mowbray (NCA 24), Pennine Dales Fringe (NCA 22), Durham Magnesian Limestone Plateau (NCA 15) and Durham Coalfield Pennine Fringe (NCA 16) National Character Areas, the impacts on landscape character are not likley to be significant, however, there may potentially be some indirect visual effects on these landscapes.

Regional/ Local

6. The site is located approximately 9km east of the Wynyard Park Special Landscape Area (SLA); 11km east of the Tees Valley SLA and 16km north east of the Leven Valley SLA. Due to the existing industrial character of the Lowland Tees (NCA 23) the proposed development is not likely to have signifcant impact on the landscape setting or visual amenity of the Wynyard Park, Tees Valley and Leven Valley SLA. The footprint of the site, built form and ancillary structures, including marine landing platform, transmission lines, signage, additional security fencing, lighting and roads is likely to contribute to the imposing visual clutter within the existing industrialised landscape. The existing power station is identified as being a prominent (and dominant) visual feature and the expansion of this could magnify this effect.

7. There would potentially be direct adverse landscape and visual impacts on the distinctive landscape features within the site and the Landscape Character Type (LCT) identified in the Hartlepool Borough Council Landscape Assessment (2000). This may include impacts from land raising, sea defences, the removal of some field hedgerows, trees, pasture, saltmarsh and/or mudflat through the creation of construction compounds, new power station buildings, new pylons, ancilliary facilities, a marine landing platform and water cooling culverts.

8. Indirect adverse landscape and visual impacts may result from increased vehicular traffic, both on and offshore, that in turn would have negative impact on the tranquillity of the landscape. During the construction phase there will be increased lighting which may impact on nearby residential communities more significantly in the winter months. Given the scale of the proposed development, it will not be possible to mitigate for all the landscape and visual impacts. In addition, new development alongside the existing facility will add to the landscape and visual impacts of the existing power station which is already a prominent feature.

9. Mitigation potential includes: Protective measures to conserve existing vegetation, grassland and wetlands in the temporary construction laydown area;

Landscape

avoidance of temporary laydown areas on the foreshore; siting of the power station and ancilliary structures in close proximity to the existing power station to avoid cumulative visual impacts; sensitive design and/or alignment of the water cooling facility and marine landing platform; provision of buffer zones between construction compounds and nearby residential properties; delivery of construction materials by sea to reduce road use; light shields to reduce light spill and restricted working hours to limit light pollution in the winter months. Construction of any sea defences, if required, should be in a position that avoids direct impact on the wet grassland, saltmarsh and mudflats in a form that respects local materials and distinctiveness. Sensitive design (using tunnelling options) and or alignment of the water cooling facility and a low impact design for the marine landing platform may reduce adverse impacts on the foreshore. Other measures might include: delivery of construction materials by sea to reduce road use and restricting working hours to limit further potential light pollution.

10. Key opportunities include landscape restoration proposals that may include grassland, wetland and lagoon restoration on decommissioning of the power station. This could include landscape restoration and offsite enhancement measures including the creation of grassland, marshland and wetland lagoons as part of an Integrated Land Management Plan.

11. With the 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	L	L	L

Significant Effects

- Due to the extensive industrial character that generally surrounds the mouth of the River Tees, there is unlikely to be nationally or regionally significant adverse direct and indirect landscape and visual impacts during the construction, operation or decomissioning of the proposed power station.
- The day and nightime visual amenity and landscape setting of the National Park and Heritage Coasts are not likely to be significantly affected by the development.
- Direct impacts are likely to be at a local level and may include the loss of grassland, field hedgerows, trees, saltmarsh and/or mudflat and these could largely be compensated for.

Mitigation and Monitoring Possibilities

- Given the potential scale and extent of the new power station facilities, opportunities for visual impact mitigation of adverse effects during the construction and operational phases,are likely to be limited to sensitive siting close to existing buildings and to a lesser extent detailed architectural design and site landscaping.
- Opportunities for site level landscape mitigation appear favourable with the potential for use of predominantly brownfield land for the permanent site buildings.

Landscape	
• Indirect impacts are likely to result from increased onshore and offshore traffic that will in turn have a negative impact on the tranquilty of the landscape. • The decommissioning of the facilities may allow some landscape restoration of previously developed areas in the long term, however, the long term land uses for restored areas is difficult to predict. This leads to the view that the precautionary principle ought to be applied when it comes to assessing the significance of impacts at this stage.	• Some potential for visual impact mitigation through sensitive siting, colouring and detailed building design. This is, however, limited given the necessary building scale. • Also, rationalisation and reduction of unsightly clutter and infrastructure within the site. • Decommissioning may allow some landscape restoration of previously developed areas including removal of overburden derived from construction, reinstatement of prevailing topography, management of wet grassland and improvements to habitat connectivity with local wildlife sites. • The decommissioning of the facilities may allow some landscape restoration of previously developed areas in the long term, which could be delivered and monitored through the use of an integrated land management plan. However, long term land uses for the restored areas remain difficult to predict.

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:

- Floodplains and estuary of the River Tees.
- No significant geological designated site lies within the local vicinity, although the ecologically designated sites, for example Seaton Dunes and Common SSSI, Seal Sands SSSI etc. (see Biodiversity for full listing) are present in the immediately surroundings.
- No significant agricultural land adjacent to Hartlepool Site
- Greenfield land within the site area

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary

1. The site potentially lies within or immediately adjacent to Seaton Dunes and Common SSSI and Seal Sands SSSI. Construction activities, including associated infrastructure, are likely to have a detrimental effect on 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. Impacts can be avoided or reduced by avoiding the ecologically designated sites and by limiting the footprint of the development reducing the area of soils affected.

2. There are no geological designations of note within the local vicinity.

Soils, Geology and Land Use

Regional/ Local

3. The area adjacent to the site lies within a region classified to be of Lime Rich to Moderate fertility the National Soils Resources Institute but is classified as urban and not utilised for agricultural purposes.

4. Construction of the site has the potential to be on a Greenfield site. The loss of any Greenfield land is likely to be of local significance however much of the site is likely to be on reclaimed or Brownfield land.

5. Mineral abstraction has been recorded approximately 1km to the north but it is unlikely that the site will significantly affect local mineral resources given its locality on Made Ground/Tidal Flat deposits.

6. Radioactive contamination of soils is not covered as part of this assessment but is addressed 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. The area historically has been heavily industrialised, including shipworks and chemical factories. As such, the potential exists for significant contamination to be present. Detailed assessments will be required as part of the site specific EIA in order to assess any mitigation requirements.

Summary of Significant Strategic Effects:

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

Significant Effects

- The construction at the site and associated infrastructure (including transmission lines/towers) will lead to the direct loss of soils and impacts to soil structure. This may include impacts on soils that maintain terrestrial habitats, including designated nature conservation sites.

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

1. The potential effects on surface water hydrology and fluvial and coastal geomorphology are likely to be limited to the Tees 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

2. The site lies within areas which are shown on Environment Agency (EA) maps[5] as being at risk of coastal flooding. Accordingly, during the life span of site, 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 estuarial 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 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. The effects of the construction and long-term presence of upgraded coastal defences on coastal

[5] Environmental Agency http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=452500.0&y=532500.0&topic=floodmap&ep=map&scale=1&location=Hartlepool%20Bay,%20Hartlepool&lang=_e&layerGroups=default&textonly=off

Water - Hydrology and Geomorphology

process, hydrodynamics and sediment transport within the estuary could be reduced or possibly eliminated by the adoption of suitable, environmentally-friendly designs. The site is situated next to, or in close proximity to, numerous ecologically designated sites, such as the Teesmouth and Cleveland Coast SPA and Ramsar. Mitigation measures will need to recognise these designated areas.

3. The provision of cooling water for the site may require excavation/dredging in the estuary 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. Tidal flows into and out of the estuary basin on which the site sits is restricted due to the presence of a headland, and this may present special conditions with respect to cooling water discharge to the receiving basin. The development of mitigation measures will need to recognise the presence of the ecologically designated sites.

4. 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 watercourses 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.

Summary of Significant Strategic Effects:

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

Significant Effects

- Additional coastal defence works may result on effects on coastal processes, estuarine hydrodynamics and sediment transport, plus indirect effects on internationally and nationally designated habitats.
- Works to provide (and discharge) cooling water may result on effects on coastal processes, estuarine hydrodynamics and sediment transport, plus indirect effects on internationally and nationally 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 site 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 Environment Agency 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).

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

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

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. Mitigation measures will have to recognise potential impacts on the ecologically designated sites, given the relatively enclosed nature of the estuary basin within which the site is located.

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 Environment Agency to ensure compliance with all relevant legislation.

Summary of Significant Strategic Effects:

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

Significant Effects

- Thermal effects of cooling water discharges (if this mode of cooling were to be adopted) on the receiving waters are likely to arise. However, this effect is of local and regional significance, although potential indirect effects may arise to internationally/naturally designated ecological sites.

Mitigation and Monitoring Possibilities

- Thermal discharges will need to be consented by the Environment Agency. 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?

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

1. The site lies within the River Tees 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 at the nominated may increase demand for potable supplies both at the site and in local communities where the workforce will live. The potential magnitude and duration of increased water demand will depend on the timing of the development at the site in relation to the activities (operation or decommissioning) of the existing site. 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. Similar effects are likely to apply to wastewater production from the site.

4. The Hartlepool Water Resource Zone has a projected surplus over target headroom to 2035. Thus, there is the potential to provide water supply to the site without a negative impact on the WRZ supply-demand balance. This would need to be confirmed once estimates of predicted water use are available and can be included with the supply-demand balance calculations.

	Timescale	C	O	D

Water- Water Supply and Demand				
Summary of Significant Strategic Effects:	Significance	-	0	0
	Likelihood	M	H	H
Significant Effects • Increased demand for water is likely to arise during the construction phase. The potential magnitude and duration of increased water demand will depend on the timing of the development at the site in relation to the activities of the existing site. Similar significant effects are likely to apply to wastewater production from the site.	**Mitigation and Monitoring Possibilities** • Studies are required to ensure that capacity of water and wastewater infrastructure in the 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.

Potential Significant Effects and Mitigation Possibilities:

International/National/Transboundary

Not significant.

Regional/ Local

1. There are no major aquifers in the vicinity of the site and hence no Groundwater Protection Zones 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. No minor aquifers are present.

2. Increased water supply would likely be derived from within the existing Hartlepool WRZ, with supply from the Magnesian Limestone Aquifer. Increased groundwater abstraction could lead to impacts on groundwater dependent surface water features and aquatic ecosystems, and also increase the risk of impacts from highly mineralised groundwater.

Summary of Significant Strategic Effects:

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

Significant Effects	**Mitigation and Monitoring Possibilities**
• Potential impacts on groundwater dependent features and aquatic ecosystems in Magnesian Limestone Aquifer	• Studies will be required to ensure that groundwater dependent bodies are investigated as well as assessing the potential

Water- Groundwater Quality and Flow	
• Potential impacts from migration of highly mineralised groundwater within the aquifer.	for migration of highly mineralised groundwater and that suitable monitoring and 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 and District ecosystems in coastal and estuarial waters and on foreshore.

Potential Significant Effects and Mitigation Possibilities:

International/ National/ Transboundary
Not significant.

Regional/ Local

1. The potential effects on geomorphology are likely to be limited to the local area.

2. As a result of climate change sea levels are predicted to rise, resulting in an increase in the current risk of flooding to the site. The site is located in Flood Zone 3, and is at risk from coastal flooding. There are currently no flood defences protecting this area. To mitigate against both current and future flood risk, flood protection measures will be required. This could be either in the form of formal raised defences or through land raising of the site. The construction of new flood defences may impact on coastal processes, the geographic spread and effects of which are unknown without further investigation (see Water: Hydrology and Geomorphology above).

Summary of Significant Strategic Effects:

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

Significant Effects

- Main effects are through interference of any new coastal defence works on coastal processes.

Mitigation and Monitoring Possibilities

- It may be possible to mitigate these effects by suitable design and selection of appropriate construction methods and also appropriate management of the defences. Further investigations are required to determine the nature and extent of any effects.

Appendix 3: Plans and Programmes Review (Regional)

Regional Spatial Strategy for the North East to 2021 (July 2008) (Government Office for the North East)

The North East of England Plan or Regional Spatial Strategy for the North East replaces Regional Planning Guidance for the North East (RPG1). It covers Northumberland, County Durham, Tyne and Wear and the Tees Valley and addresses matters such as housing, the environment, transport, infrastructure, economic development, agriculture, mineral extraction and waste treatment and disposal.

Air Quality

- Contribute to sustaining the current downward trend in air pollution in the region.
- Consider the potential effects of new developments and increased traffic levels on air quality.
- On internationally designated nature conservation sites, and adopt mitigation measures to address these impacts.

Historic Environment

- The historic environment of the North East will be conserved and enhanced.

Flood Risk

- Encourage schemes that maintain and restore the dynamic physical environment, and recognise the importance of working with natural processes in adapting to predicted sea level rise.
- If flood risk is not to increase over time, lowest risk sites should be identified for future development.
- Material considerations may outweigh the flooding issues within identified flood risk areas e.g. the need for economic and social regeneration and the need to use previously developed land.

Renewable Energy Generation

- The generation of at least 10% of the Region's consumption of electricity from renewable sources within the Region by 2010 (454 MW minimum installed capacity – 138 MW for Tees Valley).
- 20% of Regional consumption by 2020.

Biodiversity

- Promote the protection and enhancement of internationally and nationally important sites and species in the North East in order to meet

Regional Spatial Strategy for the North East to 2021 (July 2008) (Government Office for the North East)

Regional Biodiversity Targets.

Housing

- Hartlepool is identified as being allocated a Net Dwelling Provision of an average of 395 dwellings per year up to 2021.

Employment

- There is provision for 345 hectares of allocated employment land in Hartlepool over the plan period.

Regional Transport Corridors

- The A19 between the major conurbations of Tyne and Wear and the Tees Valley is considered, by the Region, to be a route of Strategic National Importance.
- Future major transport investment for the A19/Durham Coast rail line will be required for both public transport and highways infrastructure.

Protecting and Enhancing the Environment

- The quality, diversity and local distinctiveness of the environment throughout the North East will be maintained and enhanced.

Coastal Planning

- The Tees Valley Coastal Arc Initiative, stretching from Hartlepool through Redcar, will exploit the potential of the coast as an economic and tourism driver for the city-region in terms of the potential for increased business and commercial activity within an environmentally attractive coastal landscape/townscape setting.

Chemical and Steel Industries

- 65 hectares of land in Hartlepool should be safeguarded for development of chemical and steel manufacturing industries.

LINK: http://www.gos.gov.uk/gone/planning/regional_planning/

Regional Economic Strategy for the North East 2006-2016 (2006) (One North East)

The Regional Economic Strategy (RES) sets out long-term proposals to transform the North East economy and focuses on making progress on broad themes of leadership, business, people and place to achieve sustainable and inclusive economic growth.

Regional Spatial Strategy for the North East to 2021 (July 2008) (Government Office for the North East)

The vision of the RES is that *"The North East will be a region where present and future generations have a high quality of life. It will be a vibrant, self-reliant, ambitious and outward looking region featuring a dynamic economy, healthy environment and a distinctive culture. Everyone will have the opportunity to recognise their full potential."*

The RES:

- Outlines the region's main economic development priorities.
- Analyses the strengths, weaknesses, threats and opportunities facing the region.
- Provides a framework for the region's public, private and voluntary and community sector organisations to deliver actions for greater and sustainable prosperity.
- Provides information on the region and its economy and the key relevant Government policies for developing the region.

LINK: http://www.onenortheast.co.uk/lib/liDownload/10092/RES%20Summary.pdf?CFID=5871698&CFTOKEN=79408647

Regional Housing Strategy for the North East (July 2007) (Regional Housing Board – Part of North East Assembly)

The Regional Housing Strategy (RHS) sets out the strategic air aims and objectives of the Regional Housing Board (RHB) and provides a framework for policies and proposals at all levels in the North East region.

The strategic objectives of the RHS are:

- Rejuvenating housing stock and markets.
- Providing choice through a better mix of types of new homes.
- Improving and maintaining existing homes.
- Meeting specific housing requirements within our communities.

LINK: http://www.strategyintegrationne.co.uk/document.asp?id=365

Climate Change Action Plan for North East England (May 2008) (North East Assembly)

The Climate Change Action Plan sets out the actions required to tackle climate change challenges that the North East faces and discusses what is already taking place to combat this. The plan identifies high level strategic actions as well as more detailed individual actions.

The relevant priority actions are to:

- Reduce Carbon Dioxide emissions in line with Government targets (currently 60% by 2050 – possibly as high as 80% after review).
- North East local government to work in partnership with others to support a strong regional position on renewable energy and to champion the North East as a key UK location for the new and renewable energy industry.
- Commission a study to review tidal risk and response within the Tees industrial sector.
- Identify parts of the region where extreme weather events could significantly impact infrastructure, community, business and the natural environment – develop early recognition and response mechanisms to action against these impacts.
- Continued promotion of environmental and renewable energy technologies in the region.
- Raising awareness, institutional change, education and training, development of policies and strategies in order to ensure that the North East is better able to respond to environmental change, through the development of adaptive actions.

LINK: http://www.strategyintegrationne.co.uk/document.asp?id=819

Sustainable Communities in the North East (2005) (Office of the Deputy Prime Minister)

This regional plan addresses the actions that are required to create sustainable communities in the North East. It highlights actions to address housing, planning and neighbourhood renewal issues.

Key issues are:

- Improving affordability and creating a better balance between housing demand and availability.
- Ensuring the North East has cleaner, safer and greener localities.
- Tackling social disadvantage and poverty.

LINK: http://www.communities.gov.uk/documents/communities/pdf/143942.pdf

North East Strategy for the Environment (March 2008) (North East Environment Forum)

The North East Strategy for the Environment provides a regionally agreed framework for long term actions to deliver a clean, healthy and diverse environment that is valued by people and businesses. This document also underlines the importance of the environment to the economy, quality of life and health and well-being of the region. The strategy considers the region's environmental assets and the role they play in everyday life through four broad themes. Each theme has key objectives that the region must achieve in response to challenges and opportunities that are faced.

The main objectives for the North East set out in this document are:

- Raise the quality of the region's housing and its surroundings to contribute towards the creation of sustainable communities, economic development and a high quality environment.
- Protect and enhance the region's historic environments and heritage assets and ensure that their worth is recognised and invested in, enhancing their benefits to society.
- Ensure climate change is coherently addressed in all policies and developments, so that adaption and mitigation measures are identified and implemented across all sectors reinforcing the drive towards a low carbon and resilient region.
- Ensure that energy generation, efficiency and affordability take account of environmental issues in the development of policies and strategies.
- Manage the region's waste in an efficient and sustainable manner, emphasising waste reduction and maximising opportunities to use waste as a resource through re-use, recycling and energy recovery.
- Conserve, enhance and manage biodiversity and geodiversity for their own sake and to make the North East a better place.
- Protect and improve ground, river and sea quality in the region, ensuring that water quality and quantity are considered in all developments and managed in a sustainable and integrated manner.
- Conserve and enhance the region's marine and coastal environments by adopting an eco-system based approach to their sustainable use and recovery to deliver benefits for people, heritage, industry and wildlife.
- Protect and improve the quality of regional land resources to ensure that land is used in a sustainable and innovative manner.
- Ensure the region's atmosphere maintains its current high standards with no future degradation in terms of air quality, light pollution and tranquillity.

LINK: http://www.onenortheast.co.uk/place/environment.cfm

Northumbria River Basin Management Plan (2009) (Environment Agency)

This plan outlines what the Environment Agency, under the guidelines of the UK Water Framework Directive, aim to achieve with regards to improving the water environment over the next 20 years. The plan focuses on the pressures facing the water environment in the Northumbria River Basin District, and the actions that will address them.

The key targets of the plan are:

- By 2015, 15% of surface waters (rivers, lakes, estuaries and coastal waters) in this river basin district are going to improve for at least one biological, chemical or physical element. This includes an improvement of over 878km of river, in relation to fish, phosphate, specific pollutants and other elements
- 49% of surface waters will be at good or better ecological status/potential and 33% of groundwater bodies will be at good status by 2015
- At least 42% of assessed surface waters will be at good or better biological status by 2015

The following challenges are addressed in the plan:

- point source pollution from water industry sewage works
- physical modification of water bodies
- disused mines, point and /or diffuse pollution source
- diffuse pollution from agricultural activities
- diffuse pollution from urban sources

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

North East Regional Renewable Energy Strategy 2005 (March 2005) (North East Assembly)

The North East Regional Renewable Energy Strategy is a supporting document to the RSS and sets out the region's renewable energy targets and primary areas of focus. Significant points raised within the strategy include:

- Hartlepool is identified as the best area in the Tees Valley region for Wind Power developments
- The region could possibly achieve a higher figure of 13% of electricity consumed by 2010 and 17% by 2020 from onshore resources

LINK: http://www.pvnortheast.org.uk/lib/liDownload/10815/renew_energy_strat_mar05.pdf?CFID=5871800&CFTOKEN=30776449

North East Biodiversity Action Plan 1999 (1999) (Tees Valley Biodiversity Action Plan)

The Tees Valley Biodiversity Action Plan identifies 26 habitats and 6 species within the region which specific action plans have been

produced. The action plans have been produced for the following reasons:

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

LINK: http://www.nesbiodiversity.org.uk/

Towards a Waste Management Strategy for the North East 2003 (February 2003) (North East Assembly)

The purpose of the Regional Waste Management Strategy is to identify options for meeting the future waste management requirements of the North East Region and give guidance on land use planning aspects of waste management for the future up to 2025. It focuses on all the primary waste streams: commercial and industrial (C and I) waste; construction and demolition (C and D) waste; municipal solid waste (MSW); agricultural and special/hazardous waste.

The strategy will involve:

- Maximise waste minimisation and re-use
- Meeting household waste recycling targets of 33% by 2015 through recycling and composting
- Meeting a recovery target for municipal solid waste of 72% and a recovery target for commercial and industrial waste of 73% through recycling, composting and anaerobic digestion with minimum disposal to landfill; and
- Increasing the percentage of construction and demolition waste recycled to 80%

The strategy and its actions are directed at the public, local authorities, the waste industry and non-governmental organisations with the overall aim of reducing the amount of waste being produced in the region. Spatial elements of the Regional Waste Strategy have been incorporated into the RSS for the North East policies on waste management.

LINK: http://www.strategyintegrationne.co.uk/document.asp?id=796&pageno=8&extlink=195

Hartlepool Local Plan 2006 (April 2006) (Hartlepool Borough Council)

The Hartlepool Local Plan is in the process of being superseded by the emerging Local Development Framework; however the document is

still relevant and holds key policies, which relate to the existing nuclear power station at Hartlepool.

Policy PU6 discusses future development of the existing nuclear power station at Hartlepool and its potential replacement and outlines the importance of effects on landscape, biodiversity and transport with regards to future development proposals.

Policy PU6 – About 57 hectares of land are held by British Energy for operational purposes. Development proposals requiring planning permission will be approved where they do not have a significant detrimental effect on the surrounding area by virtue of visual impact or increased traffic flows, and where they do not have a significant adverse effect on adjacent international and national sites of nature conservation interest.

LINK: http://www.hartlepool.gov.uk/downloads/file/961/hartlepool_local_plan_2006

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				
North East Air Quality	1,2	Air quality in the North East region of England is generally good. The combined air quality indicator, used to compare the English regions, places the North East as the third best region. This is based on the proportion of Lower Super Output Areas (LSOAs) that are in the worst 20% of all SOAs in England. There are 7 Air Quality Management Areas (AQMAs) in the North East region of England, none of which are in the Hartlepool Borough Council catchment area.		The average number of days with moderate or higher air pollution has varied annually. Significant peaks were experienced in 2003 and 2006, however these can be associated with particularly hot, dry weather conditions experienced across the UK. At two locations in the region, results greater than the UK average have been observed since 2002, however in recent years the results have fallen to levels quite close to the UK average.

Key to Data Sources

1	State of the Region Report for North East England [2008]. North East Regional Information Partnership. http://www.nerip.com/reports_briefing.aspx?id=564 [accessed 03 March 2009]
2	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				
Biodiversity Action Plan Priority Habitats	1,2	The site lies within the Northumbrian Water BAP and the Tees Valley and adjacent to Durham BAP. Priority Habitats that are adjacent to the site include Mudflat, Coastal Sand Dunes, Coastal Flooplain Grazing Marsh and Reedbeds.		
Natura 2000 sites (N2K)	3	There are 6 N2K sites within 20 km of the site: • Durham Coast SAC • Castle Eden Dene SAC • North York Moors SAC • Teesmouth and Cleveland Coast SPA • Northumbria Coast SPA • North York Moors SPA		
Ramsar sites	3	There are 2 Ramsar sites within 20km of the site: • Teesmouth and Cleveland Coast • Northumbria Coast		
Sites of Special Scientific Interest (SSSI)	4	There are 256 SSSI's within the North East region with 106 located within Cleveland and Durham. * The condition of SSSI land in England is assessed by Natural England. There are six reportable condition categories: favourable; unfavourable recovering; unfavourable no change; unfavourable declining; part destroyed and destroyed. Condition Summary of SSSI's in the North East Region (256 SSSI's)		

Indicator	Data Source	Current Data	Comparators	Trend

% Area meeting PSA[6] target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed
84.26%	26.35%	57.91%	12.09%	3.44%	0.21%

Condition Summary of SSSI's within Cleveland (18 SSSI's)

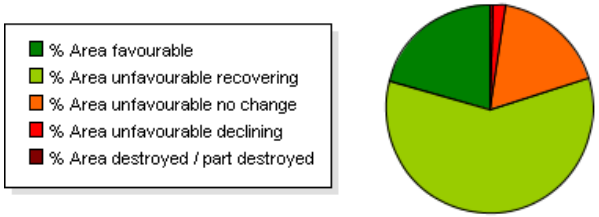
% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed
82.66%	45.54%	37.12%	16.90%	0.09%	0.34%

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

Indicator	Data Source	Current Data	Comparators	Trend

Condition Summary of SSSI's within Durham (88 SSSI's)

% Area meeting PSA target	% Area favourable	% Area unfavourable recovering	% Area unfavourable no change	% Area unfavourable declining	% Area destroyed / part destroyed
79.68%	20.71%	58.97%	17.82%	2.05%	0.44%

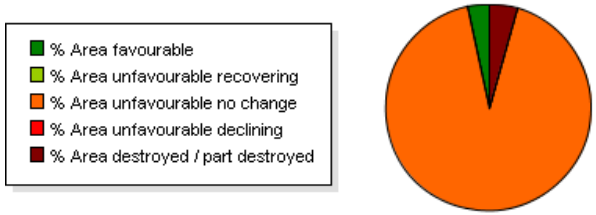


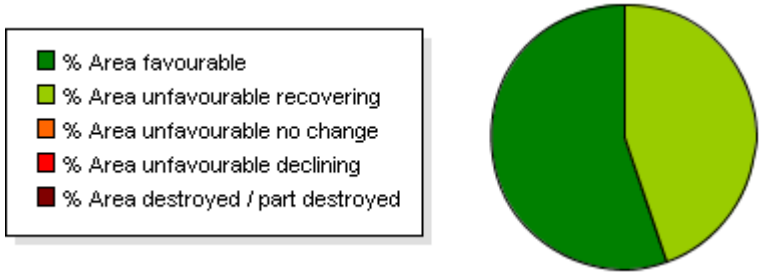
<table>
<tr><th>Indicator</th><th>Data Source</th><th colspan="2">Current Data</th><th colspan="3">Comparators</th><th colspan="2">Trend</th></tr>
<tr><td></td><td></td><td colspan="7">There are 29 SSSI's within 20km of the site, of these 8 (7 of which form part of the Teesmouth and Cleveland Coast SPA and Ramsar designated areas) fall within 8km and are considered particularly relevant to any development of the site. These are:

• Cowpen Marsh
• Durham Coast
• Redcar Rocks
• Seal Sands
• Seaton Dunes and Common
• South Gare and Coatham Sands
• Tees and Hartlepool Foreshore and Wetlands
• Hartlepool Submerged Forest</td></tr>
<tr><td></td><td></td><td></td><td>% Area meeting PSA target</td><td>% Area favourable</td><td>% Area unfavourable recovering</td><td>% Area unfavourable no change</td><td>% Area unfavourable declining</td><td>% Area destroyed / part destroyed</td></tr>
<tr><td></td><td></td><td>Cowpen Marsh</td><td>46.82%</td><td>46.82%</td><td>0%</td><td>53.18%</td><td>0%</td><td>0%</td></tr>
<tr><td></td><td></td><td>Durham Coast</td><td>93.16%</td><td>60.18%</td><td>32.98%</td><td>6.39%</td><td>0.45%</td><td>0%</td></tr>
<tr><td></td><td></td><td>Redcar Rocks</td><td>100%</td><td>100%</td><td>0%</td><td>0%</td><td>0%</td><td>0%</td></tr>
<tr><td></td><td></td><td>Seal Sands</td><td>3.31%</td><td>3.31%</td><td>0%</td><td>92.35%</td><td>0%</td><td>4.34%</td></tr>
<tr><td></td><td></td><td>Seaton Dunes and Common</td><td>100%</td><td>55.39%</td><td>44.61%</td><td>0%</td><td>0%</td><td>0%</td></tr>
<tr><td></td><td></td><td>South Gare and Coatham Sands</td><td>100%</td><td>100%</td><td>0%</td><td>0%</td><td>0%</td><td>0%</td></tr>
<tr><td></td><td></td><td>Tees and Hartlepool Foreshore and Wetlands</td><td>100%</td><td>100%</td><td>0%</td><td>0%</td><td>0%</td><td>0%</td></tr>
<tr><td></td><td></td><td>Hartlepool Submerged Forest</td><td>100%</td><td>100%</td><td>0%</td><td>0%</td><td>0%</td><td>0%</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>Seal Sands SSSI (forms a component part of the Teesmouth and Cleveland Coast SPA and Ramsar)

Adjacent to the site</td><td>5</td><td colspan="3">Seal Sands are the only extensive area of intertidal mudflats, with tidal channels on the East coast. These mudflats are of great ornithological importance attracting large numbers of migratory wildfowl and wading birds especially during the winter months. Of particular note are internationally important concentrations of shelduck which feed on Seal Sands, which represent 2% of the total Western European population.

Condition Summary: Seal Sands SSSI
<table>
<tr><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>3.31%</td><td>3.31%</td><td>0.00%</td><td>92.35%</td><td>0.00%</td><td>4.34%</td></tr>
</table>

</td></tr>
<tr><td>Seaton Dunes and Common SSSI (forms a component part of the Teesmouth and Cleveland Coast SPA and Ramsar)</td><td>6</td><td colspan="3">Seaton Dunes and Common is an area of considerable importance for its flora, invertebrate fauna, and bird life. The range of habitats includes sandy, muddy and rocky foreshore, dunes, dune slacks and dune grassland, as well as relict saltmarsh, grazed freshwater marsh with dykes pools and seawells.
Condition Summary: Seaton Dunes and Common SSSI
<table>
<tr><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>
</table></td></tr>
</table>

Indicator	Data Source	Current Data	Comparators	Trend
Adjacent to the site		<table><tr><td>100.00%</td><td>55.39%</td><td>44.61%</td><td>0.00%</td><td>0.00%</td><td>0.00%</td></tr></table> 		
National Nature Reserves (NNR)	7	There are 16 NNR's within the North East region with, 3 of which occur within Cleveland and Durham. All 3 are within 20km of the site: • Castle Eden Dene • Durham Coast • Teesmouth Teesmouth NNR is situated adjacent to the site. It has two main parts: North Gare and Seal Sands. North Gare is an area of dunes and marsh on the north bank of the Seaton-on-Tees Channel, while Seal Sands is area of mudflats and sands on the south bank of the Channel. Key features of the NNR include: • Core feeding and roosting sites for large populations of wader and wildfowl. Knot, redshank, Sandwich tern, cormorant, shelduck and ringed plover are all present in significant numbers at various times of the year. • Apart from typical sand dune and saltmarsh plant communities, the NNR		

Indicator	Data Source	Current Data	Comparators	Trend
		is home to four species of marsh orchid, adder's-tongue fern and three rare plant species: rush-leaved fescue, stiff-leaved saltmarsh grass and brackish water crow-foot. • Invertebrates including the common blue butterfly, the burnet moth and the rare lyme grass moth. • The reserve is notable for its breeding colony of common seals and grey seals are also frequent visitors to the area.		
Local Nature Reserves (LNR)	8	There are 128LNR's within the North East region with 66 of which occur within Cleveland and Durham. Thirty-two LNR's fall within 20 km of the site, 2 of which fall within 5 km: • Seaton Dunes and Common, adjacent to the site. • Greatham Beck		
Natural Areas	9	The site lies within the Tees Lowlands Natural Area and adjacent to the southern section of the Tyne to Tees Coastal Natural Area - the low-lying land adjacent to the estuary of the River Tees – a unique mixture of heavy industrial landscape, natural habitats and outstanding bird life. The diverse range of habitats associated with the Natural Areas, including coastal mudflats support significant numbers of birds including Teal, Redshank, Curlew, Dunlin, Knot, Shelduck, Ringed Plover, Sanderling, Sandwich Tern and Turnstone. The estuary also supports a small breeding population of the Common Seal. The only notable breeding colony on the east coast between the Wash and the Tay.		
RSPB Reserve	11	The new RSPB reserve Saltholme is located less than 5km away to the south, adjacent to Seal Sands.		
Local Wildlife Sites	NA	Information to be obtained from a local records centre at the appropriate time, i.e. for a project-level EIA.		

Key to Data Sources

1	UKBAP [2007]. Northumbrian Water Biodiversity Action Plan. http://www.ukbap.org.uk/lbap.aspx?ID=423 UKBAP [2007]. Tees Valley Biodiversity Action Plan. http://www.ukbap.org.uk/lbap.aspx?ID=424
2	Natural England [2008]. Nature on the Map, Natural England. http://www.natureonthemap.org.uk/map.aspx?map=bap
3	Joint Nature Conservation Committee (JNCC). http://www.jncc.gov.uk/
4	Natural England, Site of Special Scientific Interest, condition summary information [2009]. http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?Report=sdrt18&Category=R&Reference=North+East http://www.english-nature.org.uk/Special/sssi/reportAction.cfm?Report=sdrt18&Category=C&Reference=1007 http://www.english-nature.org.uk/Special/sssi/reportAction.cfm?Report=sdrt18&Category=C&Reference=1013
5	Seal Sands SSSI Citation, Natural England. http://www.naturalengland.org.uk/ Seal Sands**,** Condition summary information.[2009] http://www.sssi.naturalengland.org.uk/Special/sssi/reportAction.cfm?report=sdrt18&category=S&reference=1000141
6	Natural England [2009]. Seaton Dunes and Common SSSI Citation. http://www.naturalengland.org.uk/ Natural England [2009]. Condition summary information. http://www.english-nature.org.uk/special/sssi/sssi_details.cfm?sssi_id=1000150
7	Natural England. North East Region, NNR details. http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nnr/regions/northeast.aspx Natural England. Teesmouth NNR information. http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nnr/1006937.aspx
8	Hartlepool Borough Council [2006] Hartlepool Local Plan including Minerals and Waste Policies http://www.hartlepool.gov.uk/site/scripts/download_info.php?fileID=961 [accessed 03 March 2009]
9	MAGIC. http://www.magic.gov.uk
10	Heritage Gateway. http://www.heritagegateway.org.uk
11	RSPB [2009] http://www.rspb.org.uk/reserves/guide/s/saltholme/directions.asp

Climate Change

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Climate Change				
North East of England Regional Assembley, Within The Wider Region (Precipitation and Temperatures)	1, 3	General projections for the UK based on data from the UK Climate Impacts Programme (UKCIP), include drier, warmer summers and milder, wetter winters. There will also be an increase in both the number and extent of extreme events (such as floods, storms, droughts and heat waves). Hartlepool Borough Council has outlined the following predicted changes to the North East climate: • Average annual temperatures in the North East may rise by between 0.5 and 1°C from 2000 levels by the 2020s • A very hot summer, as experienced in 2003 with the average August temperature 3.5°C above normal, may occur as often as 1 year in five by the 2050s. • The sea level along the Tees Valley coastline could rise by up to 20cm by 2020. • Winds are expected to increase in frequency and strength throughout the UK. An increase in wind speed of just 10% results in a rise in storm damage insurance claims of 150%. • Winters are expected to become wetter by around 4-6%, and summers drier by perhaps 7 to 10% across the North East by the 2020s. • Extreme winter precipitation will become more frequent. • Depending on emissions scenarios, winter snowfall is predicted to decrease by between 40-100% by the 2080s. The North East Climate Chage Adaptation; a partnership between Sustain, Royal Haskoning and UK Climate Impacts Programme; reports the following climate change indicators for Tees Valley on their website: **Annual and Seasonal Rainfall** Tees Valley can expect large percentage decreases in average annual rainfall, with reductions		

Indicator	Data Source	Current Data	Comparators	Trend
		of around 5% inland and around 9% at the coast. Tees Valley will still experience the lowest average annual rainfall of all sub-regions in the North East. Tees Valley could show a pattern of increased seasonality in rainfall. Winter rainfall will increase by up to around 20% and summer rainfall decrease by up to around 33%. **Severe Rainfall and Rainfall Accumulations** Whilst there is an increase anticipated in 1-day duration rainfall events and a reduction in 10-day duration events, there is no clear pattern in 2- and 5-day accumulations during the 50% Annual Exceedance Probability (AEP) events. **Snowfall** The Environment Agency Rainfall and Weather Impact Generator (EARWIG) projections show that all regions can experience a significant reduction in snowfall throughout all the seasons that are currently subject to snow. The reductions show that snowfall amounts for all seasons, except winter, fall to negligible amounts. This does not mean that winter snowfall events will become less dramatic, as severe low temperatures are still expected to be sub-zero and when coupled with the increased winter rainfall, may well mean that snowfall depths do not differ from those currently witnessed. It is the number of days with snow that will most likely reduce. **Annual and Seasonal Temperature** Annual average temperature can be expected to increase by around 1.8°C throughout the sub-region. The pattern in average seasonal changes shows autumn and summer exhibiting identical increase at the coast (around 2.1°C) but further inland summer can expect a greater increase when compared to autumn, around 2.3°C compared to around 2.1°C. **Maximum and Minimum Temperatures** The average maximum temperature change is expected to be least in winter, followed by spring, autumn and with summer experiencing the largest increase in average daily maximum. This summer increase will be higher inland (around 2.6°C) than at the coast (around 2.4°C).		

Indicator	Data Source	Current Data	Comparators	Trend
		The average minimum temperature change will be greatest in autumn (around 2.0°C) and least in winter (around 1.2°C).		
Greenhouse Gas Emissions	2	**Carbon Emissions:** The Tees Valley Climate Change Partnership Strategy (2006-2012) will achieve a minimum 8.75% reduction in CO_2 equivalent (CO_2e) below 2000 levels. This equates to an average 1.25% annual reduction target for this period. For 2012-2030 the minimum target will be 27% (an average annual target of 1.5%). These emission reductions will be achieved by progressively moving towards a low carbon economy. The following section outlines both short-term (2006-2012 inclusive) and long-term (2012-2030) emission reduction targets. Both targets will help the Tees Valley contribute to the long-term delivery of the national CO_2 reduction target of 60% below 1990 levels by 2050. **Short Term Aims** 2006-2012 ➢ An average annual 1.25% reduction from 2000 levels each year (total minimum net reduction of 8.75%) ➢ An aspirational annual 2% reduction from 2000 levels each year (total net reduction of 14%) **Long Term Aims**		

Indicator	Data Source	Current Data	Comparators	Trend
		2012-2030 ➢ An average annual 1.5% reduction from 2000 levels each year (cumulative net reduction of 35.75% below 2000 levels from 2006-2030) ➢ An aspirational annual 2% reduction from 2000 levels each year (cumulative net reduction of 50% below 2000 levels from 2006-2030) In 2000, the Tees Valley's emissions were approximately 20.5 million tonnes of CO_2e from all sectors. CO_2e includes carbon dioxide, methane and nitrogen oxides, expressed as an equivalent amount of carbon dioxide. The table below displays Tees Valley emission levels for 2000 by Local Authority area and sector.		

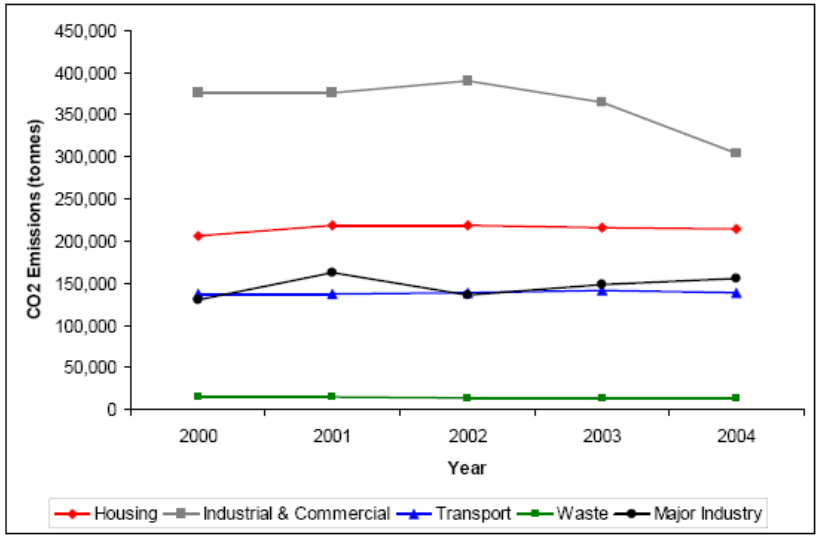
Indicator	Data Source	Current Data	Comparators	Trend

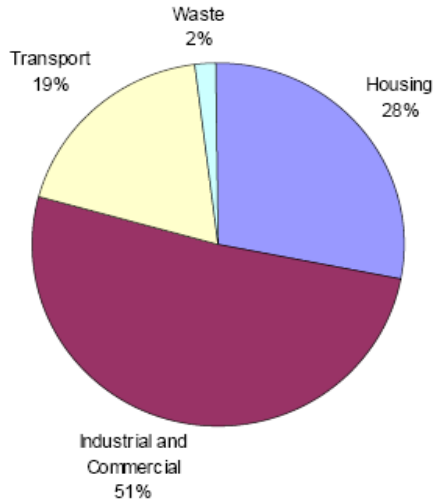
		DBC	HBC	MBC	RCBC	SBC	TV Total
Gas	Domestic	137.3	139.4	183.4	189.1	236.6	885.8
	Industrial& commercial	120.2	118.9	109.2	188.3	182.0	718.6
Electricity	Domestic	80.6	63.6	97.3	105.0	133.1	479.6
	Industrial& commercial	114.1	163.4	204.1	297.7	349.5	1,128.8
Other fuels	Solid fuels[12]	3.20	75.27	1.66	15	12.45	107.58
	Fuel oils	26	22	51	60	65	224
Energy sub-total		**481**	**583**	**647**	**855**	**979**	**3,544**
	Household waste	11	14	19	22	22	88
	Non-HH waste	3	1	0	2	2	8
	Transportation of waste	0.51	0.52	1	1	0.89	3.92
Municipal Waste sub-total		**15**	**15**	**20**	**25**	**25**	**100**
Personal transport	Bus	9.3	8.6	13.9	11.9	16.6	60.3
	Diesel car	18.4	13.2	20.1	18.0	30.4	100.1
	Petrol car	104.9	75.6	117.1	104.9	175.6	578.1
	Motorcycle	0.5	0.3	0.5	0.6	0.8	2.7
Freight	HGV	45.8	22.8	28.9	21.3	59.2	178
	Diesel LGV	23.3	16.3	22.5	19.7	35.4	117.2
	Petrol LGV	3.5	2.5	3.5	3.1	5.5	18.1
Road Transport sub-total		**206**	**139**	**207**	**180**	**324**	**1,055**
	Aviation	--	--	--	--	--	109
	Rail	--	--	--	--	--	1
Other transport sub-total		--	--	--	--	--	**110**
Total *		**700**	**735**	**873**	**2,730**	**2,493**	**4,809**
Major industry Sub-total		**2**	**149**	**10**	**10,641**	**4,912**	**15,714**
Total (all sectors)		**704**	**886**	**883**	**11,701**	**6,236**	**20,253**

Tees Valley emission levels for the year 2000 by Local Authority area and sector

Tees Valley Greenhouse Gas Emissions	2	The Tees Valley is a distinct and unique economic and cultural area in the North East of England, consisting of the 5 unitary boroughs of Hartlepool, Darlington, Stockton-on-Tees, Middlesbrough and Redcar and Cleveland.	

Indicator	Data Source	Current Data	Comparators	Trend
		 **The Tees Valley Climate Change Strategy:** • Provides a background to the current situation in the Tees Valley, in terms of energy use, waste and transport. • Sets targets of 8.75% (minimum) and 14% (aspirational) for reducing CO2e from 2000 levels for the period 2006-2012. • Introduces the Tees Valley Emissions Reporting Protocol as a methodology for monitoring emissions throughout the sub-region. Data includes gas, electricity, and other fuel (solid and oil) consumption, waste tonnages, road transport fuel consumption and emission estimates for aviation and rail. • Outlines 2000 baseline data for each Local Authority area, against which all measures to	

Indicator	Data Source	Current Data	Comparators	Trend
		reduce CO2e will be assessed. • Outlines broad actions that will be taken to achieve emission reductions, adapt to existing climate change and raise awareness amongst the community. • Provides a timescale and plan for delivery and review, including identification of partners responsible for implementation. Progress update reports will be published annually, based on carbon savings from projects implemented. Published emission levels for the Tees Valley as a whole will be released in conjunction with the availability of data from the Department of Trade and Industry (DTI).		
Hartlepool Local Authorities Greenhouse Gas Emissions	1	The graph below shows the progress achieved to date in reducing Hartlepool's CO_2e emissions 2000 – 2004.  The pie chart below shows the percentage of emissions from Hartlepool by source for the 2000 baseline. Domestic emissions from energy use (28%); transport (19%) and household waste		

Indicator	Data Source	Current Data	Comparators	Trend
		(2%) make up almost half of all emissions (49%) from Hartlepool. This is therefore an important sector where efficiency savings will directly benefit householders and reduce emissions. The average home in the borough in 2000 produced 7.98 tonnes of CO_2e per year, which is equivalent to 3.53 tonnes per resident.  The Hartlepool Partnership has already committed to a short-term target to achieve a minimum of 8.75% reduction in CO_2e (Carbon dioxide equivalent) below 2000 levels. In addition, the Council has short-term and long-term emission reduction targets. The short-term reduction target is a 14% reduction from 2000 levels by 2012. The long-term emissions reduction target is a 50% reduction from 2000 levels by 2030. Both targets will help Hartlepool to contribute towards the long-term delivery of the National CO_2 reduction target of 60% below 1990 levels by 2050.		

Indicator	Data Source	Current Data	Comparators	Trend

Sector	Emissions Source	Carbon Emissions (tonnes CO_2e)	Target emissions by 2012 (with 8.75% reduction)
Housing	Gas	139,391	127,194
	Electricity	63,617	58,051
	Other (Coal & Oil)	3,545	3,235
Industrial and Commercial	Gas	118,897	108,494
	Electricity	163,413	149,114
	Other (Coal & Oil)	93,514	85,332
Transport	Cars & motorcycles	88,090	80,382
	Other (buses & HGVs)	49,620	45,278
Waste	Landfill	3,585	3,271
	Incineration	11,616	10,600
Total		**735,288**	**670,950**

Major Industry	**130,000**
Total (all sectors)	**865,288**

Please note:

- Transport emissions do not include emissions from trains, aviation shipping industry
- Waste emissions do no include emissions from commerical waste
- Waste emissions are calculated from financial year 00/01 waste data

Hartlepool Borough Council (HBC)'s targets are shown in the table below:

	DBC	HBC	MBC	RCBC	SBC	EA (major) industry)	TV Total*
2000 baseline	701,610	737,390	873,160	1,059,600	1,327,000	15,714,000	20,522,800
Average annual reduction 2006-2012 (1.25%)	8,770	9,217	10,915	13,245	16,588	196,425	256,535
Total reduction required 2006-2012 (8.75%)	61,391	64,522	76,402	92,715	116,113	1,374,975	1,795,745

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Energy				
Energy	4,5,6	<u>Electricity Consumption 2007 (Teesdale)</u> Overall: 130.7 GWh (0.04% of UK) Average Domestic Consumption: 4,722 kWh Average Industrial Consumption: 51,334 kWh <u>Total Energy Consumption 2006 (Teesdale)</u> 927.3 GWh	<u>Electricity Consumption 2007 (North East England)</u> Overall: 13,342.2 GWh Average Domestic Consumption: 3,741 kWh Average Industrial Consumption: 108,721 kWh <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> North East England: 83,617.6 GWh UK: 2,120,261.5 GWh	Teesdale consumes about 0.04% of the UK's total electricity. About 14% of total energy consumption in Teesdale comes from electricity consumption. The Regional Spatial Strategy (RSS) for the North East says: • All strategies, plans and programmes in the Region shall seek opportunities for and encourage the use of decentralised energy supply systems based on renewable and low-carbon forms of energy

Indicator	Data Source	Current Data	Comparators		Trend
Renewable Energy	4,6	Energy Consumption from Renewable Sources 2006 (Teesdale) 8.3 GWh (0.9%)	Total Energy Consumption from Renewable Sources 2006 North East England: 222.1 GWh (0.3%) UK: 6,939.5 GWh (0.3%)	• Strategies, plans and programmes, and planning proposals should o facilitate the generation of at least 10% of the Region's consumption of electricity from renewable sources within the Region by 2010 (454 MW minimum installed capacity); o aspire to further increase renewable electricity generation to achieve 20% of regional consumption by 2020; o facilitate the achievement of a minimum sub regional targets of 138 MW for Tees Valley by 2010	
Current Capacity	7,8	The existing nuclear power station at Hartlepool has a capacity of 1,210 MW and is expected to operate until 2014. Power stations in the vicinity: • Seal Sands Power Station: gas, 50 MW, 5 km • Teesside Waste to Energy Power Station: W2E, 20 MW, 5 km • Teesside Power Station: CCGT, 1,875 MW, 8 km • Wilton Power Station: mixed, appr. 230 MW, 16 km • Lynemouth Power Station: coal-fired, 420 MW, 72 km • A CHP power plant with a capacity of 1,020 MW is currently being constructed 5 km away. It is expected to start operation in 2012.			

Key to Data Sources

1	Hartlepool Borough Council [2007].Climate Change Action Plan 2008-2009 http://www.hartlepool.gov.uk/downloads/Climage_Change_Action_Plan_Report_1_.pdf
2	Tees Valley Climate Change Partnership [2007] The Tees Valley Climate Change Strategy http://www.redcar-cleveland.gov.uk/main.nsf/538ABBD98045B32E802571B7004C8F96/$FILE/TVCCP%20Strategy%20(designed%20version%202).pdf
3	United Kingdom Climate Impact Programme UKCIP02 [2002]. Climate Change Scenarios for the United Kingdom http://www.ukcip.org.uk/images/stories/Pub_pdfs/UKCIP02_tech.pdf
4	Government Office for the North East [2008] The North East of England Plan Regional Spatial Strategy to 2021.http://www.gos.gov.uk/nestore/docs/planning/rss/rss.pdf *NB: On 22 July 2010, the Secretary of State for Communities and Local Government, Eric Pickles, announced to Parliament that the Government has the intention in principle to abolish the remaining eight Government Offices, which includes the Government office for the North East. The process will be subject to using the Spending Review to resolve consequential issues. The final decisions will be made at the end of the Spending Review in autumn 2010*.
5	Department of Business Enterprise and Regulatory Reform [2005]. Electricity Consumption Data at Regional and Local Authority Level http://www.berr.gov.uk/energy/statistics/regional/regional-local-electricity/page36213.html
6	Department of Business Enterprise and Regulatory Reform [2006]. Total final energy consumption at regional and local authority level http://www.berr.gov.uk/energy/statistics/regional/total-final/page36187.html
7	Department of Business Enterprise and Regulatory Reform [1999] Nuclear Power Stations http://www.berr.gov.uk/energy/sources/nuclear/key-issues/power-stations/page47765.html/sources/nuclear/key-issues/power-stations/page47765.html
8	Wikipedia [2008]. Power Stations in the North East http://en.wikipedia.org/wiki/Category:Power_stations_in_North_East_England

Communities: Population and Economy

Indicator	Data Source	Current Data			Comparators		Trend
Topic: Population							
Age of population	1, 2, 3,4		**Seaton**	**Hartlepool (Unitary Authority)**	**North East of England**	**England**	The resident population of the Tees area is 558,000. The projected changes in population in the next 10 to 15 years are generally consistent across age groups and localities: overall, the population aged under 45 years is projected to reduce and the population aged over 45 years is projected to increase. The North East had a population of 2.6 million in 2006. This was 16,000 more compared with mid-2001 and a decrease of 3.1% since 1981. The largest percentage change was an 11% increase in Alnwick. Evidence suggests that the North East population is changing; it is changing in volume due to both migration and natural change, in the proportions of
		All People (Count)	6,018	88,611	2,515,442	49,138,831	
		People aged 0-4 (%)	5.13	5.98	5.50	5.96	
		People aged 5-7 (%)	3.54	4.17	3.64	3.74	
		People aged 8-9 (%)	2.74	2.85	2.62	2.61	
		People aged 10-14 (%)	6.05	7.29	6.66	6.57	
		People aged 15 (%)	1.50	1.46	1.35	1.27	
		People aged 16-17 (%)	2.39	2.88	2.60	2.51	
		People aged 18-19 (%)	2.14	2.33	2.57	2.40	
		People aged 20-24 (%)	4.07	5.14	5.96	6.01	
		People aged 25-29 (%)	4.82	5.49	5.89	6.65	

Indicator	Data Source	Current Data			Comparators		Trend
		People aged 30-44 (%)	22.43	22.24	22.12	22.65	people in different age groups, and in composition of households. The region is attracting internal migrants from other parts of the UK in most age groups, although overall inward migration levels are falling. Within the region the population has a large proportion of people of working age compared to those who are at retirement age, however projections show that in the future we will have a smaller workforce and an increasingly ageing population.
		People aged 45-59 (%)	21.37	18.69	19.32	18.88	
		People aged 60-64 (%)	5.97	5.26	5.22	4.87	
		People aged 65-74 (%)	9.97	9.32	9.13	8.35	
		People aged 75-84 (%)	6.16	5.46	5.73	5.60	
		People aged 85-89 (%)	1.11	0.98	1.15	1.30	
		People aged 90 and over (%)	0.60	0.47	0.55	0.64	
		Mean age of population in the area	40.90	38.43	39.13	38.60	
		Median age of population in the area	41.00	38.00	38.00	37.00	
		The population in Seaton and Hartlepool is older than the national average and regional average. In Seaton about 7.87% of the population is aged over 75 years, with 1.62% aged over 85 years. People aged 65 and over make up approximately 16% of the Hartlepool population which is similar to the national average of 15%.					

Indicator	Data Source	Current Data		Comparators		Trend
Topic: Employment						
Percentage Economically Active – Employed %	1,2,4	**Seaton**	**Hartlepool (Unitary Authority)**	**North East of England**	**England**	In the second quarter of 2007 the employment rate (for people of working age) in the North East was 71%, one of the lowest in the UK where the overall rate was 74%.[2] Full time employment levels are similar at a ward and regional level. The District level is below the regional and national level. Part time working at ward and district level is higher than the regional and national level.
		Full Time 40.74	34.23	37.37	40.81	
		Part Time 15.19	13.33	11.87	11.81	
Percentage Economically Active – unemployed %1		3.41	5.47	4.53	3.35	Unemployment levels at a ward level are similar to the national level. They are however significantly higher at the district level.
Industry of employment **All persons**		**Seaton 100% (2,753)**	**Hartlepool (Unitary Authority) 100% (33,762)**	**North East of England 100% (1,032,968)**	**England 100% (22,441,498)**	Unemployment is consistently higher in the Tees area than the rest of England[3].
Agriculture/ Forestry (%)		0.25	0.57	1.13	1.45	
Fishing (%)		0.00	0.09	0.04	0.02	
Mining (%)		0.91	0.63	0.56	0.25	
Manufacturing (%)		19.58	20.46	16.99	14.83	
Electricity/Gas/Water Supply (%)		3.05	1.58	1.01	0.71	
Construction (%)		9.37	9.05	7.32	6.76	

Wholesale/ Retail Trade (%)		13.15	15.82	16.19	16.85	
Hotels/ Restaurant (%)		4.69	4.86	5.10	4.73	
		Seaton 100% (2,753)	**Hartlepool (Unitary Authority) 100% (33,762)**	**North East of England 100% (1,032,968)**	**England 100% (22,441,498)**	
Transport/ Communications (%)		5.27	5.92	6.76	7.09	
Financial (%)		2.29	1.91	3.04	4.80	
Real Estate (%)		8.32	8.59	9.16	13.21	
Public Admin (%)		8.03	5.70	7.43	5.66	
Education (%)		6.90	7.14	8.02	7.74	
Health and Social Work (%)		13.88	13.18	12.74	10.70	
Other (%)		4.32	4.50	4.51	5.20	
Self Employed (%)		4.77	4.29	5.27	8.32	
Socio-Economic Classifications 2001 (% Persons aged 16-74)		**Seaton**	**Hartlepool (Unitary Authority)**	**North East of England**	**England**	
Large employers and higher managerial occupations		3.32	1.94	2.27	3.50	
Higher professional occupations		2.27	2.27	3.32	5.11	
Lower managerial and professional occupations		19.40	13.33	15.14	18.73	
Semi-routine occupations		12.65	14.07	12.72	11.65	
Routine occupations		9.45	12.52	11.17	9.02	
Never Worked		1.43	3.89	3.27	2.72	

Full-time students		4.97	5.33	6.83	7.03	

Key to Data Sources

1	National Statistics [2001]. Neighbourhood Statistics: Seaton (Ward) http://www.neighbourhood.statistics.gov.uk/dissemination/LeadDatasetList.do?a=7&b=6101667&c=TS25+2BZ&d=14&g=385752&i=1001x1003&m=0&r=0&s=1236085973495&enc=1&domainId=15
2	National Statistics [2008]. National Statistics, North East. http://www.statistics.gov.uk/cci/nugget.asp?id=1126
3	Hartlepool Primary Care Trust [2008] Annual Public Health Report 2007-2008. http://www.tees-pcts.nhs.uk/upload_documents/docs/2008923113027_1%20%20Hpool%20full.pdf
4	North East Regional Information Partneship [2006]. Report on Demograhic Change. http://www.nerip.com/Reports_Briefing.aspx?id=301
5	Committee on Medical Aspects of Radiation in the Environment (COMARE). http://www.comare.org.uk/comare_docs.htm

Communities: Supporting Infrastructure

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Transport				
Regional freight Routes	1	**Road** Hartlepool is generally well served by transport links. The A19(T) through the west of the borough provides a major north-south trunk road through the region connecting Hartlepool to Durham and Tyne and Wear to the north and the rest of the Tees Valley and North Yorkshire to the south. The A19(T) is connected to the main urban area of Hartlepool via the A689 and A179 principal roads. These roads also provide the major north-south road link for local trips within the town. Accessibility from each borough to other centres (e.g. Hartlepool residents to Stockton Centre) is generally not as good with much longer journey times than to the equivalent local Centre. Traffic levels and congestion on the A66 east – west corridor are also high at certain times of the day. Principal freight routes are the trunk and principal roads mentioned above, in addition to the A1053(T) and A174(T). Future growth associated with regeneration are being taken forward in partnership with the Highways Agency Existing locations already witnessing congestion include the A19(T) Tees Flyover and adjacent interchange with A66, the junction of the A19(T) and A174(T), and sections of the A66 around Darlington and through Middlesbrough and Stockton. There are also a number of local roads where capacity is being reached at peak times, in particular key radial routes into Middlesbrough, Stockton and Darlington. Based on current growth trends, and on-going modelling work undertaken by the TVJSU, parts of the network are likely to reach or exceed capacity, at certain times of the day, by the end of this plan in 2011. A Highway Network Management Plan for Hartlepool is being developed is estimated to have positive impact on greenhouse gas emissions		

Indicator	Data Source	Current Data	Comparators	Trend
		There are a number of local roads where capacity is being reached at peak times, in particular key radial routes into Middlesbrough, Stockton and Darlington. A comprehensive bus service network provides for local journeys and inter-urban/express services to neighbouring town centres. A developing network of local cycle routes provided local connections with links to the north and south of the borough via National Cycle Network Route14. **Rail** The Durham Coast railway line from Sunderland to Thornaby serves the borough with stations at Hartlepool and Seaton Carew and is operated as part of the Northern Rail Franchise. As well as providing direct regional links to Newcastle, Sunderland, Stockton and Middlesbrough, the line is also used for rail freight. Longer distance rail journeys require connections to services on the East Coast Main Line at Newcastle and Northallerton or York. Hartlepool to East Coast Main Line – direct link to York, preferably continuing to London or the Midlands; A £2.5m scheme to build a modern transport interchange next to Hartlepool railway station is being progressed by the local council to make public transport journeys more accessible, less time consuming and more attractive. Works are expected to commence in autumn 2007 and to be completed in the summer of 2008. The new interchange is funded entirely through LTP. **Docks** Hartlepool North Dock was once the UK's fourth busiest port, handling coal exports and timber imports. However, the impact of containerisation and the increased use of PD Ports' nearby deep water and modern facilities at Teesport has reduced shipping at Hartlepool. Its marina is the location of major redevelopment and unlikely to be a route for commercial maritime transport. **Air** The borough is well placed for road access to and from Durham Tees Valley and Newcastle International Airports, which give access for personal, business and freight movement to National, European and International destinations. Existing public transport accessibility to Durham Tees Valley Airport is also not as good as to other key hubs. A partnership is now in place to help deliver improved surface access into the site by public transport.		

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Waste				
Municipal Waste	2	Durham County Council has increased the proportion of waste recycled or composted from 17% in 2003/2004 to just under 25% in 2007/2008. Landfill remains the principal method of waste disposal in County Durham. In total 205,179 tonnes (68%) of municipal waste was sent to landfill in the region in 2006/2007, However municipal waste in the Hartlepool region is managed through the Tees Valley Joint Waste Management Group. An Energy from Waste (EfW) plant is currently operational at Haverton Hill, in the Borough of Stockton-on-Tees. Reprocessing facilities for recyclables currently exist within the Waste Management Group region (paper, glass, metals, wood, plastics and green wastes). Hartlepool Borough Council currently deliver a proportion of their residual waste stream to the EfW plant at Haverton Hill, and are committed to do so until 2020. Over 50% of the residual waste streams generated within the region are treated at the EfW plant, whilst approximately 22% is sent to landfill. A number of landfill sites are currently used for the disposal of residual wastes, both within and outside the Waste Management Group region, such as the Cowpen Bewley landfill site situated in Billingham (approximately 17 km from the proposed site). One hazardous waste facility (Seaton Meadows) is currently operational within the region, situated approximately 8 km from the proposed site. No further details were availble relating to the current location and capacity of the municpal waste landfill sites at the time of writing. The hazardous waste facility currently has planning permission to operate until 2030.		Total municipal waste production in the region during the period 2006/2007 was 302,261 tonnes reducing to 291,000 tonnes in the period 2007/2008. A reduction of 37% within a one year period. Total household waste continues to decrease in the region and was almost 18% higher in 2005/2006 than in 2006/2007, decreasing from 234,280 tonnes to 191,292 tonnes.
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		

Indicator	Data Source	Current Data	Comparators	Trend
		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	Hartlepool Borough Council [2006]. Local Transport Plan. http://www.hartlepool.gov.uk/site/scripts/download_info.php?fileID=900
2	Durham County Council [2008]. Joint Municipal Waste Management Strategy http://www.durhamwsp.info/SiteCollectionDocuments/JMWMSCountyDurhamSummary2008.pdf [accessed 03 March 2009]
3	Government Office for the North East [2008] The North East of England Plan Regional Spatial Strategy to 2021.http://www.gos.gov.uk/nestore/docs/planning/rss/rss.pdf *NB: On 22 July 2010, the Secretary of State for Communities and Local Government, Eric Pickles, announced to Parliament that the Government has the intention in principle to abolish the remaining eight Government Offices, which includes the* Government office for the North East*. The process will be subject to using the Spending Review to resolve consequential issues. The final decisions will be made at the end of the Spending Review in autumn 2010*.

Human Health and Well-being

Indicator	Data Source	Current Data	Comparators	Trend
Topic: 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, Hartlepool 011D to England as a whole as follows: • Income deprivation less than average • Employment deprivation greater than average • Health deprivation greater than average • Education deprivation less than average • Barriers to housing and services are much less than average • Crime is less than average • Living environment deprivation is much less 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 Hartlepool Borough Council's area ranked as 23 out of 354 (where 1 is most deprived). This ranking shows that the Hartlepool area is very deprived.	Other district councils in Durham are ranked as follows: • Darlington is 54 • Sedgefield is 95 As can be seen all of the district councils in	

<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>Durham are deprived to some extent but Hartlepool is the most deprived.</td><td></td></tr>
<tr><td>Age profile (mid 2006)</td><td>1</td><td>In the Super Output Area, Hartlepool 011D 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>18.5</td></tr><tr><td>16 – 64 (males)
16 – 59 (females)</td><td>56.9</td></tr><tr><td>65+ (males)
60+ (females)</td><td>24.6</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 higher proportion of people in the upper age bracket (retired or approaching retirement in the Super Output Area, Hartlepool 011D than in the UK as a whole. There are also proportionately 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, Hartlepool 011D were as follows:

• Good – 66.3%
• Fairly good – 22.5%
• Not good – 11.3%</td><td>For comparison purposes, the same data for the overall Hartlepool area and England are as below:
<table><tr><th></th><th>Hartlepool</th><th>England</th></tr><tr><td>Good</td><td>64.2</td><td>68.8</td></tr><tr><td>Fairly good</td><td>23.5</td><td>22.2</td></tr><tr><td>Not good</td><td>12.3</td><td>9.0</td></tr></table>
Overall the figures for the Super Output Area,</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></td><td></td><td></td><td>Hartlepool 011D are comparable to those of the Hartlepool Borough Council area and with England as a whole.</td><td></td></tr>
<tr><td>Life expectancy at birth (Jan 04 – Dec 06)</td><td>1</td><td><table><tr><th></th><th>Hartlepool</th></tr><tr><td>Males</td><td>74.50</td></tr><tr><td>Females</td><td>78.30</td></tr></table></td><td><table><tr><th>NE of England</th><th>England</th></tr><tr><td>75.80</td><td>77.32</td></tr><tr><td>80.10</td><td>81.55</td></tr></table>As can be seen from above, the life expectancy in the Hartlepool Borough Council area is slightly below the national average for England.</td><td>Data from the same source for previous years show that these figures for life expectancy at birth in the Hartlepool Borough Council area have risen slightly for males since January 2001 but remained more or less static for females over the same period.</td></tr>
<tr><td>Infant mortality (Jan 03 – Dec 05)</td><td>1</td><td>Infant mortality in the Hartlepool Borough Council area for the years in question was 4.3 persons in every 1000.</td><td>This shows that infant mortality in Hartlepool is low compared to the figures of 4.7 persons per thousand for the North-east 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 Hartlepool Borough Council area have declined since 1998-2000.</td></tr>
<tr><td>Proximity to medical services</td><td>3</td><td>Medical services in the area of the site are as follows:
Three General Practitioner (GP) practices (Seaton Surgery, McKenzie House and Wynyard Road Primary Care Centre) within 5 km of the site. Sixty other GP practices are within 10 km of the site.</td><td></td><td></td></tr>
</table>

Indicator	Data Source	Current Data	Comparators	Trend
		• Closest hospital is Sandwell Park (6.8 km) but this has no Accident and Emergency (Accident and Emergency) department • Nearest hospital with an Accident and Emergency department is The University Hospital of Hartlepool in Holdforth Road, Hartlepool which is 8.0 km away • The nearest hospital providing mental health services is Sandwell Park which is 6.8 km away		
Education - examination results for young people (2006-07)	1	In the Super Output Area, Hartlepool 011D, 50% of pupils achieved 5 or more A*- C grade passes including English and Mathematics at GCSE or equivalent.	This compares to the figure of 38% of students for the Hartlepool Borough 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 Hartlepool Borough Council area for the year in question was 1.5%.	This compares to a percentage of 4.3% for the North-east of England region and 4.2%for England as a whole.	
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	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 Hartlepool sampling were as follows: • estimated dose from locally grown foodstuffs was 0.006 mSv	Trends in the data noted from sampling in previous years are as follows: • a small apparent increase in estimated dose from locally grown foodstuffs was observed from the

Indicator	Data Source	Current Data	Comparators	Trend
		marine food and animal samples were collected from around the site in 2007 • analysis of tritium, carbon-14 and sulphur-35 in milk, crops and fruit all generally showed low concentrations of artificial radionuclides although some enhancement of carbon-14 concentrations were detected • concentrations of radioactivity in freshwater were below the World Health Organisation's screening level for drinking water • there were some elevated concentrations of artificial radionuclides in the marine samples taken but the majority of these were assessed as having emanated from sources other than the power station	• estimated dose to local fish and shellfish consumers was less than 0.005 mSv • the total dose from all sources, including direct radiation, was assessed as being 0.021 mSv	less than 0.005 mSv value recorded in 2006 • there was no trend in the estimated dose to local fish and shellfish consumers as the value derived in 2006 was also less than 0.005 mSv • there was no trend in the assessed total dose as the value derived in 2006 was also 0.021 mSv
Health related to nuclear installations	5	There has been, since 1983, a nuclear power station operating on the Hartlepool 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 Hartlepool are as below: • actual cases of childhood leukaemia and	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 77.96 • the expected number of cases of childhood tumours between 1969 and 1993 in a 25km area around the plant should have been 130.84 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	

Indicator	Data Source	Current Data	Comparators	Trend
		non-Hodgkin lymphoma between 1969 and 1993 in a 25km area around the plant were 77 • actual cases of childhood solid tumours between 1969 and 1993 in a 25km area around the plant were 140	discharges or secondary exposure from re-suspended material.	

Key to Data Sources

1	Office of National Statistics 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 [2007] Indices of Deprivation. http://www.communities.gov.uk/communities/neighbourhoodrenewal/deprivation/deprivation07/
3	NHS 'Find Services'. http://www.nhs.uk/servicedirectories/Pages/ServiceSearch.aspx
4	Food Standards Agency (2007). Radioactivity In Food and the Environment (RIFE 13) report. 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

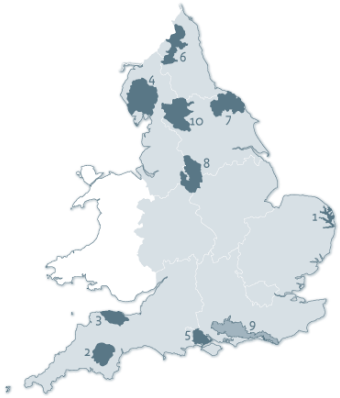
Indicator	Data Source	Current Data	Comparators	Trend
Topic: Cultural Heritage				
Scheduled Monuments	1	There is 1 Scheduled Monument, namely Claxton Medieval Moated Site, located within 5km of the existing nuclear power stations.		
Conservation Areas	2	There are 3 Conservation Areas within 5km of the existing nuclear power stations, the nearest of which is Seaton Carew c.1.9km to the north.		
Listed Buildings	3	There are 54 listed buildings within c.5km of the existing nuclear power stations, although none within or immediately adjacent to it.		
Potential historic landscape	2	An area of historic landscape is located directly to the north of the existing nuclear power stations.		
Archaeological sites	3	Archaeological sites in the form of 20th century military buildings are located adjacent to the existing nuclear power stations and the potential exists for others to be present within the site. Layers of palaeo-environmental potential may also be present.		
Protected Wrecks	1	There is one Protected Wreck Site, Seaton Carew, within 5km of the existing nuclear power stations and this lies c.2.4km to the north.		

Key to Data sources

1	MAGIC. http://www.magic.gov.uk
2	Hartlepool Borough Council.[2006] Harlepool Local Plan http://www.hartlepool.gov.uk/downloads/Hartlepool_Local_Plan_without_appendices_etc.pdf
3	Heritage Gateway. http://www.heritagegateway.org.uk

Landscape

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Landscape				
National Character Area (NCA)	1	The site is situated within the Tees Lowlands (NCA 23) on the north side of the river Tees estuary between the conurbations of Hartlepool, Stockton on Tees, Middlesbrough and Redcar. Key Characteristics include: • A broad low lying plain of gently undulating, predominantly arable farmland with wide views to distant hills. • Meandering, slow-moving River Tees flows through the heart of the area dividing the lowlands to north and south. • Contrast of quiet rural areas with extensive urban and industrial development concentrated along the lower reaches of the Tees, the estuary and the coast. • Large-scale chemical and oil refining works, dock facilities and other heavy plants along the Tees estuary form a distinctive skyline by day and night. • Overhead transmission lines, pylons, motorway corridors, railway lines and other infrastructure elements are widespread features. • Woodland cover is generally sparse, with local variations including Skerne Carr on the steep banks of the middle reaches of the Tees, and within parkland and managed estates. • Distinctive areas of peaty fenland flats and carrs within the Skerne lowlands. • Extensive areas of mudflats, saltmarsh wetlands and dunes at the mouth of the river Tees which support valuable wildlife habitats. • Minor valleys and linear strips of open land extend as 'green corridors' from rural farmland into the heart of the Teesside conurbation. Surrounding NCA's within the north east region include: • North Yorkshire Moors and Cleveland Hills (NCA 25) • Vale of Mowbray (NCA 24) • Penine Dales Fringe (NCA 22) • Durham Magnesian Limestone Plateau (NCA 15) • Durham Coalfield Penine Fringe (NCA 16)		

National Park (NP)	2	 **Map showing National Parks** 7 - North Yorkshire Moors
Heritage Coasts	3	 **Map showing heritage coastline** 2 - Durham

		3 - North Yorkshire and Cleveland		
Indicator	**Data Source**	**Current Data**	**Comparators**	**Trend**
	4	Relevant Designations, Regional Spatial Strategy (RSS) and Adopted Local Plan Policies The site is located approximatelly 20km to the north of the North York Moors National Park (NP); 16km south of the Durham Heritage Coast and 18km north west of the North Yorkshire and Cleveland Heritage Coast. These nationally important designations provide statutory protection to Areas of Outstanding Natural Beauty. Relevant policies from The North East of England Regional Spatial Strategy (RSS) to 2021 (July 2008) that relate to these statutory designations include: Policy 2 - Sustainable Development Policy 8 - Protecting and Enhancing the Environment Policy 10 - Tees Valley City- Region Policy 31 - Landscape Character Policy 33 - Biodiversity and Geodiversity		
	5	The site is located approximately 1km south west of the Seaton Carew Conservation Area (Policy HE 1); 0.5km south west of Protected Greenspace and Coastal Margins (Policy GN3) of geological/ geomorphical importance; 0.5km north of International Conservation Sites (Policy WL1) and 0.5km south of existing industrial areas (Policy Ind5) designated within the Hartlepool Local Plan including Minerals and Waste Policies (Adopted April 2006). Policies that relate to these planning designations include: Policy GEP1 - General Environmental Prinicples Policy GEP 5 - Environmental Impact Assessment Policy GEP 12 - Tree, Hedgerows and Developments Policy GEP 15 - Cumpolsory Purchase of Potential Development Sites Policy IND 5 - Industrial Development Policy PU6 - Nuclear Power Station Policy REC 1 - Coastal Recreation Policy REC 8 - Areas of Quiet Recreation Policy GN3 - Protection of Key Green Space Issues Policy RUR 7 - Developments in the Countryside		

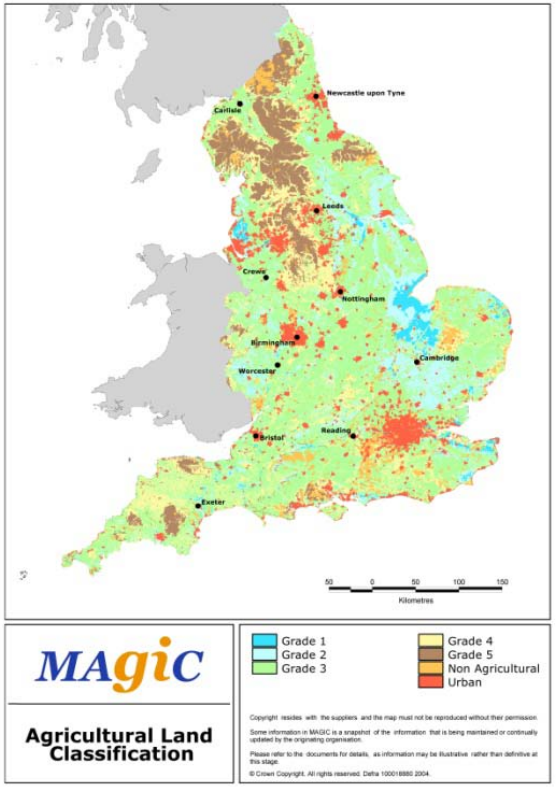
		Policy RUR 16 - Recreation in the Countryside The site is located approximately 1km north of the Seal Sands SSSI and 2.5km north east of the Cowpen Bewdley Woodland Country Park which forms part of the Cleveland Community Forest. Relevant policies from the Stockton on Tees District Council Local Plan (Adopted 1997) that relate to these planning designations include: Policy EN7 – Development which harms the landscape value of the Leven Valley, Tees Valley and Wynyard Park Special Landscape Areas (SLA) would not be permitted. Policy EN11 – Cleveland Community Forest. The planting of trees, of locally appropriate species will be encouraged within the area Cleveland Commmunity Forest Area. (NB: Stockton and Tees LDF unpublished)

Key to Data Sources

1	Natural England. National Character Areas – Tees Lowlands NCA (23) http://www.naturalengland.org.uk/Images/jca23tcm2-21126_tcm6-5286.pdf
2	Natural England – National Parks http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/nationalparks/default.aspx [accessed 03 March 2009]
3	Natural England – Heritage Coasts http://www.naturalengland.org.uk/ourwork/conservation/designatedareas/heritagecoasts/default.aspx [accessed 03 March 2009]
4	Government office for the North East [2008].The North East of England Regional Spatial Strategy to 2021 [2008] http://www.gos.gov.uk/nestore/docs/planning/rss/rss.pdf [accessed 03 March 2009] *NB: On 22 July 2010, the Secretary of State for Communities and Local Government, Eric Pickles, announced to Parliament that the Government has the intention in principle to abolish the remaining eight Government Offices, which includes the* Government office for the North East*. The process will be subject to using the Spending Review to resolve consequential issues. The final decisions will be made at the end of the Spending Review in autumn 2010*.
5	Hartlepool Borough Council [2006] Hartlepool Local Plan including Minerals and Waste Policies http://www.hartlepool.gov.uk/downloads/Hartlepool_Local_Plan_without_appendices_etc.pdf1 [accessed 03 March 2009]

Soils, Geology and Land Use

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Soils				
Agricultural Land Classification Soils	**1**	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. **National Soils Research Institute (Report available)** **Wallasea Soils** **Deep stoneless clayey soils. Calcareous in places** **Marine alluvium** **Soils seasonally waterlogged by fluctuating groundwater and with relatively slow lateral saturated conductivity** **Winter cereals and some sugar beet, potatoes, cereals and field vegetables**		



Topic: Geology		
Geological SSSIs Geology and Land Quality	**3** **2**	**There is no geological SSSI's within the local vicinity** **Envirocheck Report (Report available)** **<u>Geological Risks:</u>** **The local Geology is likely to be made ground over Tidal Flat Deposits underlain by the Sherwood Sandstone Group and Mercia Mudstone Group.** **There is a ceased mineral site located approximately 900m east of the site.** **Based on the information within the Envirocheck Report the geological risks are:** • **Very low to moderate risk for the Potential for Compressible Ground Stability Hazards** • **Very low risk for the Potential for Landslide Ground Stability Hazards** • **Very low to moderate risk for Potential for Running Sand Ground Stability Hazards** • **Very low risk for the Potential for Shrinking or Swelling Clay Ground Stability Hazards** **<u>Environmental Hazards:</u>** **Based on the Envirocheck report the main environmental Hazards are;** **There are number of landfills within 1 km of the nature and extent of the landfills are un-quantified. A number of industrial licences are identified in the local area..** **<u>Historic Land Use:</u>** **Historic maps ranging from the 1850's to current were studied. The area was heavily industrialised from the 1900's including ship works and chemical factories.**

Key to Data Sources

1	National Soils Research Institute Report 27373823 – (Report available on request). Purchased 3rd March 2009
2	Envirocheck Report 27373823_1 – (Report available on Request) Purchased 3rd March 2009
3	Natural England Nature on the Map web site accessed on the 05th March 2009-03-05 http://www.natureonthemap.org.uk/map.aspx?m=nreserves

Water Quality and Resources

Indicator	Data Source	Current Data	Comparators	Trend
Topic: Water				
Current State of the Waters in the Northumbria River Basin District	1	In the Northumbria River Basin District (RBD), 27% of rivers (by length) meet the requirements for good ecological status or good ecological potential, with 2% at high status or potential. A greater number of groundwater bodies (89% by number) meet the requirements for good quantitative status, while 50% of estuaries and transitional and coastal waters meet the requirements for good status or good potential. In most cases, single pressures cause a failure to meet good status or potential. The most common failing elements are invertebrates, then phosphorus and morphology. Of the 356 river water bodies, 19% are candidate heavily modified or artificial water bodies, for the 73 lakes and reservoirs, 30% are candidate heavily modified or artificial water bodies, with 66% of these water bodies not assessed. Of the 7 identified transitional (estuary) water bodies, 6 are candidate heavily modified bodies, while for the 7 identified coastal waters, 5 are considered to be natural water bodies, 1 a Candidate Heavily Modified Body, while 1 was not assessed. The Northumbria RBD River Basin Management Plan (RBMP) predicts that by 2015, 42% of rivers will reach good status or good potential, with 2% at high status or potential. In the Tees catchment, 27% of all water bodies are achieving good status or potential. The Northumbria RBD has over 170km of coastline, 25km^2 of estuaries, 34 designated bathing waters as well as many important marine species and habitats. The three main estuaries of the Tyne, Wear and Tees are all vital to the region's economy, particularly their contribution to the tourism and leisure industry and ports, harbours, shipping and associated industries they support.		

Indicator	Data Source	Current Data	Comparators	Trend
		These main estuaries have failed good potential status mainly because of morphological conditions which will need further investigation. Bathing water quality dropped slightly on the Northumbria coast in 2008 after a very wet summer. There are nine groundwater bodies within the Northumbria RBD. The pressures and significant risks to these groundwater bodies have been identified as abstraction, mining and mine waters, and chemicals, for example, nitrates, sulphates, chloride, chloroform, lead, copper and zinc. Of these nine groundwater bodies, 3 have been classified as at good status, and low risk for quality, and good status and probably not at risk for quantity. Three others fail to meet good status for surface waters only from mining impact, one groundwater body is probably at risk from diffuse pollution, while 2 others fail to meet good status for general chemical assessment and impact on surface water. The final groundwater body within the District, the Magnesian Limestone, is the sole supply to the Hartlepool area, and has issues with respect to both quality and quantity. Particular issues are nitrates, mine water pollution, and potential abstraction pressures. This groundwater body is currently at poor status and at risk for quantitative purposes. However, this groundwater body is located to the west and south of the site. The groundwater body over which the site is located is the Tees Sherwood Sandstone, and is one of the three groundwater bodies classified as at good status for both quantity and quality. Local information for the area around site 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>
<table>
<tr><th rowspan="2">Sector</th><th colspan="2">Ecological / Quantitative (GW) 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>Groundwater (Tees Sherwood Sandstone)</td><td>Good</td><td>Good</td><td>Good</td><td>Good</td></tr>
<tr><td>Estuary (cHMWB)[7]</td><td>Moderate Potential</td><td>Moderate Potential</td><td>Moderate</td><td>Moderate</td></tr>
<tr><td>Coastal (cHMWB)</td><td>Good Potential</td><td>Good Potential</td><td>High</td><td>Good</td></tr>
</table>
The location of the existing site is on the Tees Estuary, with both the estuary and coast candidate Highly Modified Water Bodies. The ecological quality of the estuary is classified as moderate potential both at present and predicted in 2015, while for the coast it is classified as good potential both at present and predicted in 2015
The chemical quality of the estuary is assessed as moderate both at present and predicted in 2015, while the coast is assessed as high at present, predicted at Good for 2015.
There is no groundwater source protection zone located in close vicinity to the site.
</td><td></td></tr>
<tr><td>Current State of the Waters in the Northumbria River Basin District</td><td>2, 3</td><td>The site is located within the Tees Catchment Management Abstraction Strategy, prepared in March 2008. The site is located just outside the eastern boundary of the Sherwood Sandstone Water Resource Management Unit (WRMU). The current resource availability status within this WRM is classed as water available but with a target status in 2014 and 2020 as no water</td><td></td></tr>
</table>

[7] Candidate Heavily Modified Water Body

Indicator	Data Source	Current Data	Comparators	Trend
		available. There are a number of water related Special Areas of Conservation, Special Protection Areas or Sites of Special Scientific Interest in close proximity to the site. The site itself is surrounded on 3 sides by the Teesmouth and Cleveland Coast SPA and Ramsar, with the Seaton Dunes and Common and Cowpen Marsh SSSIs nearby. Also within close proximity to the site is the Tees and Hartlepool Foreshore and Wetlands SSSI. Water supply for Hartlepool is provided from the Magnesian Limestone Groundwater Unit, which is located within the Wear Catchment Management Abstraction Strategy, prepared in September 2006, with an Annual Update from March 2008. The current resource availability status within this GWRM is classed as water available but with a target status for 2012 and 2018 of moving to no water available. This assessment did not change in the March 2008 Annual Update. There are a number water related Special Areas of Conservation, Special Protection Areas or Sites of Special Scientific Interest within the Magnesian Limestone Groundwater Unit. These include Hell Kettles and Durham Coast SSSIs, the Castle Eden Dene and Durham Coast SPAs, as well as the Northumbria and Durham Coast SAC and Ramsar sites.		
Water Demand and Availability Projected to 2035	5	The assessment of demand and supply occurs at the level of a Water Resource Zone (WRZ). A WRZ is defined by the 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'. The site is located with Anglian Water's WRZ12. Demand is only to the town of Hartlepool and the adajcent industrial area on north Teeside. Historically, industrial dominated over domestic demand. However with the decline in industrial output there is a large available headroom in this zone. The Hartlepool WRZ has a surplus over target headroom over the whole of		Growth is forecast over the planning period to 2035 to be at some 200 dwellings per year, with a population increasing marginally from 90,000 to 92,000. It is expected that domestic demand will decline over this period from 12Ml/d to 10Ml/d. Commercial demand is expected to remain steady over the planning period at around 9 Ml/d.

Indicator	Data Source	Current Data	Comparators	Trend
		the planning period to 2035. Although the Hartlepool WRZ has a projected surplus to 2035, a new source has been developed within the Magnesian Limestone. This was licensed within an aggregate licenced quantity, as a contingency option within the 2003 Drought Plan. It is recognised that closure of mine workings with the associated decline in pumping to dewater mine workings has resulted in the migration of highly mineralised water into part of the aquifer system. There is currently no risk to public water supplies, although the potential for this to affect the water quality of the aquifer that is used for public water supply is being investigated by Anglian Water, the Environment Agency and the Coal Authority.	
Sensitive Areas – Urban Waste Water Directive	6	There are no Shellfish Waters in close proximity to the site. The nearest identified Bathing Waters are at Seaton Carew North, Seaton Carew Centre and Seaton Carew North Gare. There are more Bathing Waters further to the east at Redcar. There are also Eutrophic Waters at Seal Sands on the Tees Estuary.		
Coastal Processes and Sediments		The north east of England is subject to high energy wave conditions, dominated by north and north easterly winds. Alongshore transport of sediment (littoral or longshore drift) is achieved by waves and the currents they induce within the breaker zone. The direction is determined largely by the angle of wave approach, i.e. it is related to the dominant fetch and thus the general direction of transport is towards the south on the east coast of England. Although exposure to waves is high and hence potential rates of sediment transport are high, the actual rates are likely to be low due to partial trapping of the sediments within the bays along the coast. It is suggested that very little beach sediment moves south out of Hartlepool Bay and Tees Bay and in fact these act as sediment traps.		

Key to Data Sources

1	Environment Agency [2008]. Draft River Basin Management Plans: Current State of Waters http://wfdconsultation.environment-agency.gov.uk/wfdcms/en/Northumbria/Intro.aspx [accessed March 2009][8]
2	Tees Catchment Management Abstraction Strategy, [2008] [accessed March 2009] http://www.anglianwater.co.uk/_assets/media/wrmp-sea-non-technical-summary.pdf
3	Environmental Agency [2008] Wear Catchment Management Abstraction Strategy, September 2006 and Annual Update March 2008 http://publications.environment-agency.gov.uk/pdf/GENE0408BNYW-E-E.PDF [accessed March 2009]
4	Anglian Water Services Ltd [2008]. Water Resources Management Plan, Draft for Consultation http://www.anglianwater.co.uk/_assets/media/water-resource-management-plan.pdf [accessed March 2009]
5	Environmental Agency [2008]. Map of Hartlepool http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=452500.0&y=532500.0&topic=floodmap&ep=map&scale=4&location=Hartlepool%20Bay,%20Hartlepool&lang=_e&layerGroups=default&textonly=off
6	Urban Waste Water Treatment Directive Sensitive Areas; North East Region http://webarchive.nationalarchives.gov.uk/20080305115859/http://www.defra.gov.uk/environment/water/quality/uwwtd/sensarea/pdf/sensarea-neast.pdf

[8] 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	The site lies within Flood Zone 3 'High Probability', as indicated on the Environment Agency's Floodmap. This means that the site is at risk from coastal flooding with an annual probability of flooding of >0.5% in any one year. There are no natural or formal coastal flood defences in this area. Map available separately. *SMP and SFRA were consulted, but contained no relevant information.		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 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

Indicator	Data Source	Current Data	Comparators	Trend
				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	Environmental Agency [2008]. Map of Hartlepool http://maps.environment-agency.gov.uk/wiyby/wiybyController?x=452500.0&y=532500.0&topic=floodmap&ep=map&scale=4&location=Hartlepool%20Bay,%20Hartlepool&lang=_e&layerGroups=default&textonly=off

URN: 10D/877

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