

Strategic Environmental Assessment Site Specific Baseline

Hinkley Point A Site



FOREWORD

This document has been prepared to support the NDA's Strategic Environmental Assessment of its decommissioning strategy for the 10 Magnox Sites. This document contains baseline environmental information and other relevant environmental data.

STRATEGIC ENVIRONMENTAL ASSESSMENT Site Specific Baseline

Hinkley Point A Site
Nr. Bridgwater
Somerset
TA5 1YA

Hinkley Point A Site

Hinkley Point A Site is a twin reactor Magnox station undergoing decommissioning, and is located in the West Somerset District of the county of Somerset, South West England. It is situated on the Hinkley Point headland in Bridgwater Bay, on the southern shore of the Bristol Channel, from which it drew cooling water supplies during its operational phase. EDF's Hinkley Point B power station is situated immediately adjacent to the east. The site covers an area of approximately 20 hectares¹. The following describes the key dates for Hinkley Point A Site:

- Construction of Hinkley Point A Site commenced in 1957 and electricity was first supplied to the grid in 1965¹.
- The site ceased electricity generation in 2000 after 35 years of operation¹.
- Defuelling of the reactors was completed by 2004¹.
- The Care and Maintenance Preparations (C&MP) phase of the decommissioning process is scheduled to be completed in 2025 at which point the site will enter the Care and Maintenance (C&M) phase².
- Final Site Clearance (FSC) is scheduled to commence at the end of the C&M phase. All remaining structures on the site will be cleared by 2106².

1. Magnox Ltd (2011) Hinkley Point A – Facts and Figures. Available at <http://www.magnoxsites.co.uk/our-sites/hinkley-point-a/facts-and-figures>

2. Magnox Ltd. (2011) LC35 Magnox Optimised Decommissioning Plan, Hinkley Point A Site

Site End State Assumption

The planned end state for Hinkley Point A Site is defined in the NDA Strategy Document 2011. This states: *'Radioactive and non-radioactive contamination will be reduced to meet the requirements of the relevant regulatory regime for the next planned use of the site and the current use of adjacent land. Where the next planned use no longer requires a nuclear site licence, radioactive contamination will be reduced to meet the criteria for delicensing, with any remaining radioactive substances being subject to the relevant environmental permitting regime. The physical state of designated land will be made suitable for the next planned use of the site; structures and infrastructure will be made safe or removed where necessary, having first explored opportunities for their re-use.'*

Current Environmental Baseline

Table 1: Baseline Data for all SEA Objectives for Hinkley Point A Site

SEA Objective	Environmental Baseline Data	References
Air Quality	<p><u>Radioactive Discharges</u></p> <ul style="list-style-type: none"> Aerial discharges of radioactivity have reduced since the cessation of generation. The reactor cores at Hinkley Point A are enclosed within Steel Pressure Vessels (SPVs), which are in turn contained within concrete structures ('bioshields') designed to protect site personnel from radiation originating from within the cores. During operations discharges of aerial activity resulted from ventilation of the bioshield voids, which released gaseous activation products when the reactors were under load. Periodic venting of reactor coolant gas was carried out during the operational phase. This has ceased since the end of generation. Nuclear operations including waste retrieval which are being undertaken as part of the decommissioning works result in minor but regular aerial discharges of radioactivity. <p><u>Conventional Discharges</u></p> <ul style="list-style-type: none"> Vehicles and diesel generators are employed on Hinkley Point A Site, which are sources of air quality contaminants including NO_x (oxides of nitrogen), SO_x (oxides of sulphur), O₃ (ozone) and PM₁₀ (particulate with a diameter <10µm). These sources run only intermittently, and due to the rural nature of the site average levels of these pollutants are likely to be low. Discharges from these sources will likely remain steady throughout the C&MP phase. Dust is currently, and will in future, be generated from construction and demolition activities undertaken on the site as part of C&MP. Mitigation of this dust is undertaken in all instances. 	
Global Climate Change and Energy	<ul style="list-style-type: none"> Throughout its lifetime Hinkley Point A Site has drawn power from the National Grid to satisfy domestic power needs (heavy plant items such as the gas circulators and cooling water pumps were driven by power derived directly from the station's output). The use of this energy has resulted in indirect CO₂ emissions, due to the mixed generation used in the UK In addition to grid supplies, the site has several essential items of plant for the provision of back up power, and these are fossil fuel powered. This auxiliary equipment consists of 1 diesel generator (with a second having recently been removed from service). These machines are not in constant use; instead they are there for emergencies, but are regularly run for testing purposes. A number of vehicles are based at Hinkley Point A Site, which have associated carbon emissions. No vehicles are used for District Survey purposes, as this is carried out by Hinkley Point B. Indirect carbon emissions originate from the use of hire vehicles by site personnel when travelling on company business in addition. Electric vehicles are also used on site by health physics and the waste team, which minimises the carbon emissions associated with site vehicle usage. Magnox Ltd. has registered under the Carbon Reduction Commitment (CRC) and also has a company-wide Energy Efficiency Policy. Both of these schemes are currently being implemented on a site by site basis, with the aim of minimising greenhouse gas emissions across the company. 	

<p>Biodiversity, Flora and Fauna</p>	<ul style="list-style-type: none"> Hinkley Point A Site is situated in a predominantly rural setting, and has 5 statutorily designated areas in close proximity. These designated areas are: <ul style="list-style-type: none"> Severn Estuary Special Protection Area Severn Estuary Ramsar Severn Estuary Special Area of Conservation Bridgwater Bay Site of Special Scientific Interest (SSSI) Bridgwater Bay National Nature Reserve In addition to the statutory sites listed above, the Hinkley Point Western Site Boundary Local Wildlife Site is situated immediately adjacent to the site, and the Lilstock SSSI is situated approx. 3 km from the site. Due to these designations the coastline adjacent to Hinkley Point A is also classified as the Severn Estuary European Marine Site^{3a}. The site Biodiversity Action Plan considers how the site manages its impacts on local ecosystems. This document is reviewed and updated on a regular basis. The Environment Agency (EA) concluded that exposure to ionising radiation from authorised discharges of radioactivity from the UK's nuclear installations did not significantly impact wildlife in England and Wales². 	<p>1. Magnox Ltd. (2011) Hinkley Point A Site Environmental Impact Assessment Baseline 2. Environment Agency (2002) Impact Assessment of Ionising Radiation on Wildlife 3. Natural England (2011) England's European Marine Sites, available at http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx</p>
<p>Landscape and Visual</p>	<ul style="list-style-type: none"> Hinkley Point A Site is located on the north Somerset Coast, facing Bridgwater Bay in the Bristol Channel¹. The main features in the immediately surrounding area are marshlands to the south and east, a double ridge and valley structure running along the coast to a shallow sea cliff, and the extensive mudflats and rocky outcrops of Bridgwater Bay The landscape to the south and west is more hilly, with the Quantock Hills Area of Outstanding Natural Beauty being situated within 7 km of the site². The boundary with Exmoor National Park is situated approximately 24 km to the west¹. The reactor buildings and other site structures are visible from the surrounding countryside and coastline in close proximity, and are visible from certain locations / perspectives at medium-long distances². This visual impact of Hinkley Point A Site is combined with that of EDF's Hinkley Point 'B' Site. As such, the Hinkley Point Power Stations are together a prominent feature in the local landscape. 	<p>1. Ordnance Survey (2011) 1:25,000 Sheet 140, Quantock Hills and Bridgwater 2. Magnox Ltd. (2011) Hinkley Point A Site Environmental Impact Assessment Baseline</p>
<p>Cultural Heritage</p>	<ul style="list-style-type: none"> There is 1 Scheduled Ancient Monument, the Pixies Mound Bronze Age tumulus, to the south of the site substation. There are 2 Grade I and 3 Grade II* Listed Buildings within 7 km of Hinkley Point A Site. There is 1 entry in the draft Register of Landscapes, Parks and Gardens of Special Historic Interest, Fairfield Garden, as listed by Natural England, within 5 km of Hinkley Point A Site. Nearby sites of archaeological interest include evidence of nearby Roman settlement. 	<p>1. Magnox Ltd. (2011) Hinkley Point A EIAB</p>
<p>Groundwater, Geology and Soils</p>	<ul style="list-style-type: none"> The site is immediately underlain by made ground consisting of clay and crushed weathered bedrock excavated from the southern part of the site. The superficial deposits in the vicinity of Hinkley Point A Site consists of alluvium and stiff clays. The bedrock at Hinkley Point A Site is the Jurassic Blue Lias, which consists of interbedded shales, mudstones and 	<p>1. Magnox Ltd. (2011) Hinkley Point A EIAB 2. Cranfield University (2011) National Soil</p>

^a Where an SPA or SAC is continuously or intermittently covered by tidal waters or includes any part of the sea adjacent to the UK, the site is referred to as a European Marine Site.

	<p>limestones, underlain by the Triassic Penarth Group; limestones and mudstones with occasional sandstone bands, underlain by the Triassic Mercia Mudstone basement rock.</p> <ul style="list-style-type: none"> • A major fault runs south west – north east across the site which dips approximately 75° to the north west, and has caused a downthrow of the westernmost strata of between 10 and 75m. A weathered zone is associated with this fault. • The superficial deposits at Hinkley Point A Site are considered a Minor aquifer. The bedrock at Hinkley Site is also considered a Minor aquifer. • There are 5 licenced abstractions within 5 km of the site which are used for general agricultural and domestic purposes. • The soils in the area surrounding Hinkley Point A Site are classified as poorly-drained (seasonally wet) loams and clays ². <p><u>Land Quality</u></p> <ul style="list-style-type: none"> • Hinkley Point A Site has limited amounts of radioactive and chemical land contamination. • The radioactive contamination is limited in extent, and is primarily associated with soil surrounding the Active Effluent Valve Pit (AEVP12). Tritium has been detected in groundwater originating from within the RCA, in addition. • The non-radioactive contamination consists of concentrations of hydrocarbon contamination associated with the essential diesel generator building, the turbine hall, and the blower houses (gas circulators) for both reactors. • Poly-Chlorinated Biphenyls (PCBs) have been detected in conjunction with the oil contamination, in addition. • The groundwater monitoring programme continues to closely monitor this contamination. 	<p>Resources Institute – Soilscales, http://www.landis.org.uk/soilscales/</p>
<p>Surface Resources and Quality</p>	<ul style="list-style-type: none"> • The nearest water body to Hinkley Point A Site is the Bristol Channel. The Stogursey Brook flows into the sea approximately 0.5km to the east of the site, and the River Parrett flows into the sea approximately 7km to the east ¹. • The ecological status of the Stogursey Brook is considered poor under the Water Framework Directive ². • The nearest bathing water sampling point is situated at Burnham-on-Sea, approximately 8km distant. This sampling point was listed as being the minimum pass standard ³. • The area of the site containing the main structures is in the EA fluvial/tidal Flood Zone 1 (so would be affected by floods less frequent than 1 in 1000 years) ⁴. • Aqueous effluent discharges (and cooling water discharges during the operational phase) have always been made to the Bristol Channel. The current radioactive aqueous effluent discharge route consists of a dedicated outlet that directs the effluent via a pipeline immediately in front of the site. Dispersion is maximised by only discharging effluent on a falling tide between 1 and 4 hours after high water. • The dispersion characteristics of the Bristol Channel are affected by factors including flow rate, sediment load, sedimentation rate, freshwater / seawater mixing rate and tidal range and atmospheric conditions. • Waterbodies containing clay mineral-rich sediments may have higher uptake potential for radionuclide anions such as Cs-137. 	<ol style="list-style-type: none"> 1. Ordnance Survey (2011) 1:25,000 Sheet 140, Quantock Hills and Bridgwater 2. Environment Agency (2011) Water Framework Directive – River Basin Management Plans – Rivers 3. Environment Agency (2011) Bathing Water Quality, http://www.environment.gov.uk/homeandleisure/37793.aspx 4. Magnox Ltd. (2011) Hinkley Point A EIAB

<p>Waste</p>	<ul style="list-style-type: none"> Both operational and decommissioning activities at nuclear sites generate radioactive and conventional waste. Low Level Waste (LLW) is generated at Hinkley Point A Site from a range of routine operational and decommissioning activities, and comprises a range of different materials. The baseline for LLW is to package the waste and send it to the Low Level Waste Repository (LLWR) near Drigg in Cumbria for disposal. Opportunities to characterise or decontaminate to Very Low Level Waste (VLLW) or exempt (for permitted landfill), size reduce, incinerate or metal melt, in order to reduce LLWR consignments, are actively sought. Intermediate Level Waste (ILW) is generated from both operational and decommissioning activities. It has accumulated at several locations at Hinkley Point A Site. The majority of which will be retrieved during C&MP when an ILW store becomes available on site. The exception to this are some Miscellaneous Activated Components (MAC) stored in vaults in the concrete bioshield which will be retrieved during FSC. <p><u>Site Waste Strategy Baseline</u></p> <ul style="list-style-type: none"> The use of self-shielding Ductile Cast Iron Containers (DCICs) for interim storage and eventual final disposal of solid and wet (which is dried within the container) ILW is being pursued by Magnox Ltd., and is to be implemented at Hinkley Point A Site. This is supported by generic and site-specific options studies, but will also be subject to regulatory approval. The waste packages will be emplaced in the site ILW store for interim storage pending eventual phased transfer to the UK national Geological Disposal Facility (GDF) circa 2040 (but possibly as early as 2029) ². The Magnox Fuel Element Debris³ (FED) waste stream has a volume of 745m³. There is a Best Practicable Environmental Option (BPEO) study that has identified dissolution as the preferred management option for this waste stream. 	<ol style="list-style-type: none"> Magnox Ltd (2011) Hinkley Point A IWS DECC (2011) Implementing Geological Disposal Annual Report April 2010 – March 2011 Walters S (2009) Fuel Element Debris Status Overview
<p>Traffic and Transport</p>	<ul style="list-style-type: none"> The site access road connects to the A39 trunk road via several unnamed rural roads. The A39 links to the national motorway network at Jct. 23 or 24 (via the A38) M5 The nearest railhead to Hinkley Point A Site is located on the Bristol to Taunton Main Line that runs through Bridgwater. This fully operational line runs regular passenger and freight services. The nearest passenger rail station is located at Bridgwater. 	<ol style="list-style-type: none"> Ordnance Survey (2011) 1:25,000 Sheet 140, Quantock Hills and Bridgwater
<p>Land Use and Material Assets</p>	<ul style="list-style-type: none"> Hinkley Point A Site occupies an area of 19.4 hectares (on an overall NDA estate of 26 hectares) ¹. The site consists of two reactor buildings, turbine hall (deplanted and the basements being infilled with spoil storage as part of groundworks for 'C' site), an ILW vault complex, various ancillary buildings, access roads, grassy areas and areas of hardstanding. The surrounding area is rural in nature and is used for agricultural and recreational purposes. Notable uses in proximity to Hinkley Point A Site include a network of footpaths in the area, including one that passes along the coast immediately adjacent to the station, and also to the immediate east and south of the site footprint. Hinkley Point A Site incorporates a significant quantity of material that is potentially eligible for direct reuse or recycling: This includes a substantial quantity of recyclable metal in the turbine hall superstructure, the boilers, the gas ducts, the SPVs, and as rebar incorporated into large concrete structures such as the bioshield ². A proportion of this recyclable metal will or has been made available for recycling during the C&MP phase, such as from the future dismantling of the turbine hall structure, once the basement has been fully infilled, and other general 	<ol style="list-style-type: none"> Magnox Ltd (2011) Hinkley Point A – Facts and Figures. Available at http://www.magnoxsites.co.uk/our-sites/hinkley-point-a/facts-and-figures Magnox Ltd. (2011) Hinkley Point A Site IWS

	<p>building dismantling.</p> <ul style="list-style-type: none"> The boilers, the primary circuit, the bioshield and the SPVs will be dismantled at FSC, so the majority of the recyclable metal on site will be produced at this time. A proportion of this material will be classified as ILW (activated reactor components in particular) so will likely not be suitable for recycling (and will likely be packaged and consigned to the GDF), but the remainder will be LLW or out of scope, and as such may be eligible for recycling and reuse within or outwith the nuclear industry ². A large volume of inert concrete and masonry rubble will be produced through demolition activities during C&MP and FSC, and will likely be reused on- or off-site as infill material, or similar ². 	
<p>Noise and Vibration</p>	<ul style="list-style-type: none"> The Baseline Noise Survey Data ($L_{Aeq\ 1\ hour}$, dB(A)), 2001 / 07) is as follows: <ul style="list-style-type: none"> Visitor's Centre – 50.0 Public footpath (including coastal footpath) – 50.4 Doggetts Farm – 43.4 Properties at Wick (e.g. Wick Farm) – 52.2 Properties at Stolford (e.g. West End Cottage) – 52.7 The criteria for the significance of noise are the proximity of noise sources to the receptors, and the presence of any screening / nature of the ground between the source and the receptor . Noise and vibration originate from a number of sources at Hinkley Point A Site. Since the cessation of generation the profile of noise and vibration from the site has changed, but remains significant due to the nature of decommissioning works. The site has been running a programme of on-site noise monitoring over the last year, which has provided valuable baseline noise data to allow comparison of noise monitoring data during noisy activities and to ensure that threshold levels are not exceeded. 	<p>1. Magnox Ltd. (2011) Hinkley Point A Site EIAB</p>

Table 2: Environmental Discharge Data for Baseline Years 2008 – 10 for Hinkley Point A Site

In addition to the baseline information, which describes the permanent, semi-permanent and inherent features and impacts of Hinkley Point A Site and its surrounding area, the following table outlines discharge data for the site for particular years, and how these quantities will likely change in future. This is intended to provide a quantitative ‘snapshot’ of the features of the site and impact that it has (and is anticipated to have in future), in order to supplement the baseline information.

SEA Objective	Environmental Discharge Data	Future Changes in Environmental Discharges	References
Air Quality	<ul style="list-style-type: none"> • The following describes the composition of radionuclides comprising the total radioactivity released by Hinkley Point A Site to atmosphere in 2008: • The following is a breakdown of the radionuclides comprising this total: <ul style="list-style-type: none"> • 0.113 TBq of H-3 (7.5 % of annual limits) • 7.31×10^{-4} TBq of C-14 (<1 % of annual limits) • 4.99×10^{-7} TBq of beta (<1 % of annual limits) ¹ • These 2008 discharges were assessed to result in doses to the critical group of 5.4 µSv (from consumption of milk and vegetables, with infants as the most exposed group; 0.54 % of the public dose limit) ². 	<ul style="list-style-type: none"> • Discharges of radioactivity to the atmosphere decreased significantly upon the cessation of generation. • As decommissioning progresses through the C&MP phase the trend will be for discharges to remain steady or continue to decrease. • However, certain decommissioning activities such as the as the retrieval, treatment and passivation of wastes and draining of the ponds may result in short term spikes in aerial discharges of radioactivity. • Once the major hazard reduction projects have been completed and the site enters the extended, quiescent C&M phase, aerial discharges of radioactivity will be extremely low. • The degassing of desiccant material in storage, bioshield concrete and core graphite may result in very minor discharges of tritium. • Dust from demolition and traffic movement may affect the local area during all 3 decommissioning phases. Civil works will be a source of dust. • FSC will result in a temporary increase in aerial discharges of radioactivity. This is because the radioactive reactor cores and associated equipment and infrastructure will be dismantled at this point. Detailed estimates for the discharges from this process have not been made, but will likely comprise particulate as major remaining structures are demolished. • Retrieval of waste packages from site for transfer to the GDF when it becomes available during the C&M phase will result in traffic movements to the site. This retrieval will likely be phased over an extended period of time, so 	<ol style="list-style-type: none"> 1. FSA (2009) Radioactivity in Food and the Environment 14 2. Magnox North and South (2008) Monitoring Our Environment

<p>Global Climate Change and Energy</p>	<ul style="list-style-type: none"> In 2010 8655 MWh of energy was used at Hinkley Point A Site ¹. This energy consumption resulted in the indirect emission of 4260 tonnes of CO₂ ¹. 57.2 tonnes of CO₂ emissions were associated with other indirect sources ¹. No direct emissions of CO₂ were associated with the site in 2010 ¹. This gives a gross emission figure of 4260 tonnes of CO₂ ¹. 	<p>the impact from this is likely to be limited.</p> <ul style="list-style-type: none"> The site will draw power from the grid and operate plant and vehicles for decommissioning works such as ILW processing and for general domestic needs until the completion of C&MP. During C&M the site's power usage will be very low, but periodic inspections and maintenance will result in very small spikes in energy usage. The retrieval of waste packages from the site ILW store during C&M will result in intermittent vehicle movements to and from the site. Energy use and the operation of numerous vehicles will resume on a significant scale during FSC. However, the types of the vehicles in use and the nature of energy mix in use in the UK at these dates cannot be predicted, thus the associated CO₂ emissions in absolute terms and relative to the present are unknown. 	<p>1. Magnox Ltd. (2010) Hinkley Point A NSP10</p>
<p>Surface Water Resources and Quality</p>	<ul style="list-style-type: none"> The following describes the composition of radionuclides comprising the total radioactivity released by Hinkley Point A Site to the marine environment in 2008: <ul style="list-style-type: none"> 0.294 TBq of H-3 (16 % of annual limits) 0.11 TBq of Cs-137 (11 % of annual limits) 0.37 TBq of other radionuclides (53 % of annual limits) ¹. These discharges were assessed to result in doses to the critical group of 12 µSv (from external exposure and consumption of seafood; 1.2 % of the public dose limit) 	<ul style="list-style-type: none"> Discharges of aqueous radioactivity decreased significantly upon the cessation of generation and dispatch of all the spent fuel to Sellafield. As decommissioning progresses through the C&MP phase the trend will be for discharges to continue to decrease. Certain decommissioning activities such as the as the retrieval, treatment and passivation of wastes, and decontamination and draining of the ponds may result in short term spikes in aqueous discharges of radioactivity. Once the major hazard reduction projects have been completed and the site enters the extended, quiescent C&M phase, aqueous discharges of radioactivity will be very low, but not zero ³. It is possible that during the decades-long C&M phase that percolating ground- and rainwater may entrain and mobilise activity from contaminated structures such as areas of the Safestore buildings ³. Routine monitoring and inspection will identify if this is occurring, and intervention will be undertaken in line with the requirements of the C&M Safety Case to ensure that any activity does not migrate off site. 	<p>1. FSA (2009) Radioactivity in Food and the Environment 14 2. Magnox North and South (2008) Monitoring Our Environment 3. Hunt C. (2011) BPM for Water Management during C&M, Bradwell Site, BRAD/BPM/017 ^b</p>

^b This document pertains specifically to Bradwell Site, but the assertions made in this report regarding water management and discharges during the C&M phase are applicable to the whole Magnox fleet.

		<ul style="list-style-type: none"> FSC will result in temporary discharges of aqueous radioactivity, primarily from waste treatment as the radioactive reactor cores and associated equipment / infrastructure are dismantled. Detailed estimates for the discharges due to this have not been made, however. 	
<p>Waste</p>	<ul style="list-style-type: none"> The following waste metrics are for 2010: Hinkley Point A Site produced 139.25m³ of LLW from decommissioning activities which has been reused, recycled or disposed of ¹. 45m³ of LLW metal was recycled, 10.25m³ of combustible LLW was treated, 54m³ of compactable LLW was treated and 30m³ of LLW was disposed to LLWR ¹. 4.3 tonnes of inert waste was produced by the site from decommissioning activities. 100% of this total was recycled ¹. 702.3 tonnes of non-hazardous waste was produced from decommissioning activities. 83% of this total was recycled ¹. Both Reactors 1 and 2 are fully defueled ². 	<ul style="list-style-type: none"> The anticipated future arisings of radioactive and conventional waste are outlined in Table 4. 	<p>1. Magnox South (2010) Nuclear Industry Sector Plan, Waste Metrics 2. Magnox Ltd. (2011) Hinkley Point A Site IWS</p>

The following table illustrates further parameters that are significant for the site.

Table 3: Additional Data for baseline Years 2008 – 10 and predicted changes for Hinkley Point A Site

SEA Objective	Additional Data	Changes in Additional Parameters	References
Surface Water Resources and Quality	<ul style="list-style-type: none"> In 2010 the site consumed 34748 m³ of mains water. 	<ul style="list-style-type: none"> Water consumption at the site is likely to continue for the duration of the C&MP period at a similar level. 	1. Magnox Ltd. (2010) Hinkley Point A NSP10
Economy, Society and Skills	<ul style="list-style-type: none"> Hinkley Point A Site is located in rural area of West Somerset District, Somerset. The major settlements within 10km of Hinkley Point Site are Shurton and Stogursey to the south, Cannington and Bridgwater to the southeast and Burnham-on-Sea to the northeast, as well as a number other smaller settlements in addition ¹. The population of West Somerset was 35400 during 2010 ². West Somerset had a working population of 18300 during 2010 ². The dominant working sectors in West Somerset during 2008 were Distribution, Hotels and Restaurants (4400, 38 %) and Public Admin, Education and Health (2700, 24 %). In December 2010, 225 staff, 7 project staff and contractors* were directly employed by Hinkley Point A Site ³. Employment in the Electricity, Gas and Water Supply industry in West Somerset was not listed, but employment at Hinkley Point A Site may have a small but measureable effect against the total working population of this district given the relatively small overall workforce of the District. In 2010 (5500, 29 %) of the population were employed to NVQ4 level or above. West Somerset is not subject to Convergence Funding from the EU, or other external assistance ⁴. <p>* Contractor numbers are variable, depending on the work being undertaken at the site.</p>	<ul style="list-style-type: none"> The number of personnel employed on site will decrease significantly after the completion of C&MP Personnel numbers at the site will increase again for the duration of FSC. 	<ol style="list-style-type: none"> Ordnance Survey (2011) 1:25,000 Sheet 140, Quantock Hills and Bridgwater Office for National Statistics (2011) Official Labour Market Statistics, available at http://www.nomisweb.co.uk/ Magnox Ltd (2011) Industrial Safety Stats @ December 2010 EU (2011) Cohesion Policy 2007 – 13, available at http://ec.europa.eu/regional_policy/atlas2007/index_en.htm

<p>Traffic and Transport</p>	<ul style="list-style-type: none"> The AADT from all traffic movements on the A39 near Cannington from recent measurements was 7861, of which 371 were HGV movements. This was the most local count point that was available. The proportion of these total movements that are directly attributable to Hinkley Point A Site is very low, and will continue to be so even during periods of increased work at the site. 	<ul style="list-style-type: none"> It is anticipated that general traffic and HGV movements will remain steady or increase during the remainder of the C&MP phase at Hinkley Point A Site. Movement of materials for potential future major construction or other projects e.g. delivery of DCICs to site, construction of the site ILW store will generate extra traffic movements, as will movement of demolition waste and other inert material for reuse or conventional disposal. A similar increase in traffic flows on local roads can be expected for the duration of the FSC phase. 	<p>Department for Transport (2011) AADF Home, available at: http://www.dft.gov.uk/matrix/search.aspx</p>
<p>Health and Safety</p>	<ul style="list-style-type: none"> Hinkley Point A Site had 0 reportable Reporting of Injuries, Diseases and Dangerous Occurrences Regulations (RIDDOR) incidents during 2010 The Occupational Safety and Health Administration Total Recordable Incident Rate (OSHA TRIR) for Hinkley Point A Site in 2010 was 0 	<ul style="list-style-type: none"> The current Health and Safety regime will likely continue to be enforced for the remainder of the C&MP phase. Comparable Health and Safety standards to the current ones will likely be enforced during the periods of the C&M phase when personnel are on site for waste package retrieval activities, inspections etc. Comparable Health and Safety standards will likely be enforced during the FSC phase. 	<p>Magnox Ltd (2011) Industrial Safety Stats @ December 2010</p>

Table 4: Future Radioactive and Conventional Waste Arisings for Hinkley Point A Site ^c

Category of Waste	Time of Arising	Unpackaged Volume (m ³)
LLW	C&MP	3066
	C&M	100
	FSC	38326
ILW	C&MP	1308
	C&M	0
	FSC	4015
Inert, hazardous and non-hazardous conventional	C&MP	74460
	C&M	0
	FSC	50232

(Hinkley Point A Site IWS, 2011)

^c Packaged volume is between 20 – 50% greater than the unpackaged volume, depending on the type of container and encapsulant applied (UK Radioactive Waste Inventory, 2007).

Main Environmental Issues for Hinkley Point A Site

Land Quality

- There is limited radioactive and non-radioactive contamination at Hinkley Point A Site, resulting primarily from historic (during the generation phase) events.
 - The radioactive land and groundwater contamination is associated with the AEVP12 on the eastern side of Reactor 1. Groundwater originating from within the RCA has been found to contain elevated levels of tritium in the western part of the site, in addition.
 - The land and groundwater that is chemically contaminated is associated with the essential diesel generator building, the turbine hall and the blower houses in both Reactor buildings. Light Non-Aqueous Phase Liquids has been found in boreholes in the vicinity of the essential diesel building and extraction has been attempted with limited success, primarily due to the complex hydrogeology at the site
 - PCBs have been identified in hydrocarbon-contaminated surface soils in a number of boreholes in the vicinity of the transformer bays, in addition.
- The contamination is limited in extent, and the groundwater monitoring programme closely monitors its distribution and ensures that it is not migrating outwith the site area.

FED Dissolution

- Following a BPEO study dissolution has been identified as the optimal treatment method for the Magnox FED waste currently in storage in the vaults on site. The technology to be used in order to implement this has not yet been determined. The decision on which technology (mainly which acid is used for the processing) will be made based upon the most suitable method used at other Magnox Sites.
 - If this process is implemented, the resultant effluent will be discharged to the Bristol Channel as per all other aqueous discharges from the site. The radiological and conventional environmental impacts of these discharges will be duly managed through abatement measures and considered through an Environmental Risk Assessment supported by modelling and dispersion studies as required.

Radioactive Discharges

- The ponds at Hinkley Point A contain residual contamination. This originated from periods during the operational phase, when imbalances in pond chemistry resulted in the accelerated corrosion of a number spent fuel elements that were in storage. This resulted in the release of fission products (predominantly Cs-137) which persist in the pond water to the present date, and have diffused into the structural concrete.
- Draining of the ponds during C&MP will result in the production of ILW (ion exchange resins) from abatement of the aqueous radioactivity. Remediation of the contamination in the pond structure to an agreed level will likely be undertaken during C&MP and / or FSC.

Climate Change and Flooding

- As with all of the coastal Magnox Sites an ongoing issue for Hinkley Point A during the C&M phase is the vulnerability of the site to flooding due to raised sea level and more frequent storm surges brought about by the anticipated effects of climate change in the coming decades. This is due to the generally low lying coastal situation of the site.
- The C&M phase at the site, during which the reactors will be in Safestore, is scheduled to last until 2081, by which approximate time (2090-99) the Intergovernmental Panel on Climate Change has projected that the worst case scenario (emission scenario A1FI) of sea level rise is in the range 0.26 – 0.59m (relative to 1990-99 levels) ¹. The site is situated at an elevation of 11m above Ordnance Datum (mAOD), and is protected from flooding and erosion by a concrete sea wall founded on the shoreline rock platform (crest height 8.5m) and a secondary gabion wall (crest 12m) behind the main sea wall ².
- Any further measures necessary to prevent flooding of the site during the C&M period, such as improvements to the flood defences, will be identified through the Periodic Safety Review requirement of the C&M Safety Case. Furthermore, the rise in sea level during the C&M period will be gradual, allowing the advance planning of any necessary mitigation measures.

1. IPCC (2007) Projections of Future Change in Climate, http://www.ipcc.ch/publications_and_data/ar4/wg1/en/spmssp-projections-of.html

2. Magnox Ltd. (2011) Hinkley Point A EIAB

Figure 1: Statutorily Designated Areas in the Vicinity of Hinkley Point A Site

