

Strategic Environmental Assessment Site Specific Baseline

Sizewell 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.

Sizewell A Site
Sizewell
Leiston
Suffolk
IP16 4UE

Sizewell A Site

Sizewell A Site is a twin reactor Magnox station undergoing defuelling, and is located close to the town of Leiston in the Suffolk Coastal District of the county of Suffolk, East Anglia. It is situated on the North Sea coast, from which it drew cooling water supplies during its operational phase, and is immediately adjacent to EDF's Sizewell B Power Station. This site covers an area of 10 hectares ¹. The following describes the key dates for Sizewell A Site:

- Construction of Sizewell A Site commenced in 1960 and electricity was first supplied to the grid in 1966 ¹.
- The site ceased electricity generation in 2006 after 40 years of operation ¹.
- Defuelling of the reactors is scheduled to be completed by 2014 ¹.
- The Care and Maintenance Preparations (C&MP) phase of the decommissioning process is scheduled to be completed in 2027 at which point the site will enter the Care and Maintenance (C&M) phase ².
- 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 2112 ².

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

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

Site End State Assumption

The planned end state for Sizewell 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 Environment Baseline

Table 1: Baseline Data for all SEA Objectives for Sizewell 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 Sizewell 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 boilers are employed on Sizewell 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 for a significant proportion of the year but 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 Sizewell 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). 85-90% of the site's supply is currently sourced directly from the National Grid and the remainder is supplied from the grid via Sizewell B's infrastructure. The use of the grid-sourced energy has resulted in indirect CO₂ emissions, due to the mixed generation used in the UK. In addition to grid supplies, the site has items of plant for the provision of back up power, and are fossil fuel powered. At Sizewell A Site this auxiliary equipment consists of 3 diesel generators; these machines are not in constant use, instead they are there for emergencies, but are regularly run for testing purposes. The 2 steam boilers at site are also significant consumers of diesel fuel / sources of CO₂, as these are run 9 months a year because plant related to defuelling must be maintained at a certain temperature (and will continue to be for the duration of the defuelling phase). A number of vehicles are based at Sizewell A Site, which are either used within the site footprint (e.g. fire tenders), or move from the site to further afield (e.g. vehicles used in carrying out District Survey work), and have associated carbon emissions. Indirect carbon emissions originate from the use of hire vehicles by site personnel in addition. 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.	
Biodiversity, Flora and Fauna	<ul style="list-style-type: none"> • Sizewell A Site is situated in a predominantly rural setting, and has a number statutorily designated areas in close proximity. • These designated areas are: <ul style="list-style-type: none"> • Minsmere-Walberswick Heaths and Marshes Site of Special Scientific Interest (SSSI) • Minsmere-Walberswick Heaths and Marshes Special Area of Conservation (SAC, incorporated into the SSSI) • Minsmere-Walberswick Special Protection Area (SPA, incorporated into the SSSI) • Minsmere-Walberswick Ramsar (incorporated into the SSSI) • Sizewell Marshes SSSI • Leiston-Aldeburgh SSSI • Sandlings SPA (incorporated into the SSSI) • Alde-Ore Estuary SPA • Suffolk Coast and Heaths Area of Outstanding Natural Beauty (AONB) ¹. • These classifications qualify the coastline adjacent to Sizewell A as a European Marine Site ^{2 a}. • The site Biodiversity Action Plan considers how the site manages its impacts on local ecosystems. This document is reviewed and updated on an annual 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 Wales ³. 	<ol style="list-style-type: none"> 1. Magnox South (2010) Sizewell A Site Environmental Impact Assessment Baseline (EIAB) 2. Natural England (2011) England's European Marine Sites, available at http://www.naturalengland.org.uk/ourwork/marine/protectandmanage/mpa/europeansites.aspx 3. Environment Agency (2002) Impact Assessment of Ionising Radiation on Wildlife
Landscape and Visual	<ul style="list-style-type: none"> • Sizewell A Site is located on the coastal plain of the Suffolk North Sea coast, on a low plateau several metres above sea level ¹. • The surrounding landscape is open and very gently undulating, with several small estuaries interspersed along with coastal plain. The land gently rises to the west and north-west, but generally the broad setting is typical of East Anglia ². • The Sizewell Sites comprise a dominant visual element at the local scale. The gently undulating land combines with existing trees and hedgerows and tends to screen most inland views of the sites in all but the closest viewpoints, with some notable exceptions just north of Leiston ². • The Heritage Coast designation in the vicinity of Sizewell (part of the AONB) is a landscape designation of national importance. 	<ol style="list-style-type: none"> 1. Ordnance Survey (2011) 1:25,000 Sheet 212, Woodbridge and Saxmundham 2. Magnox South (2010) Sizewell A Site EIAB
Cultural Heritage	<ul style="list-style-type: none"> • There are 3 Scheduled Ancient Monuments within 5km of Sizewell A Site; St Mary's Abbey, and Moat and Bowl Barrows at Aldringham Green and at Aldringham Common. • There are 30 Listed Buildings within 5km of the site. • There are no entries in the draft Register of Landscapes, Parks and Gardens of Special Historic Interest, as listed by Natural England, near to the site. 	Magnox South (2010) Sizewell A EIAB

^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. At Sizewell A this is called the Minsmere-Walberswick Heaths and Marshes European Marine Site.

<p>Groundwater, Geology and Soils</p>	<ul style="list-style-type: none"> • Made ground, consisting of reworked Crag underlies the site itself. The natural superficial deposits in the site locality consist of a thick layer of the Plio-Pleistocene Crag Group. This Crag consists of fine to medium grained shelly micaceous sands, with gravel flints. • The bedrock at Sizewell A Site consists of several successive groups of Palaeocene-Eocene age. The uppermost are the Thames Group: Harwich Formation (undivided), consisting of silty sandstone and volcanic ash layers, which overlies the Harwich Formation (Hales Clay Member), consisting of sandy mudstones with rare volcanic layers. Underlying these formations are the Lambeth Group, consisting of mottled mudstones, sands and silts and Ormesby Clay Formation, consisting of mudstone. The Cretaceous Chalk Group basement rock underlies the Cenozoic rocks at depth. • The superficial deposits at site are considered to be a Minor aquifer, although the made ground is not classified, but is likely in hydraulic continuity with the underlying Minor Aquifer. • The Palaeocene-Eocene age bedrock is considered to be a Minor Aquifer, whilst the Cretaceous age chalk rock is a Major Aquifer of regional importance. • There are 25 licenced abstractions within 5km of the site for a mixture of agricultural, domestic, industrial and public use. Nearby abstractions are the Sizewell B visitor centre and a well in Sizewell village. • The soil in the area surrounding Sizewell A Site is classified as a deep, well drained sandy soil. <p><u>Land Quality</u></p> <ul style="list-style-type: none"> • Sizewell A Site has limited areas of known contamination that have either been remediated or are managed through the site Land Quality Strategy. • The site also contains several Areas of Potential Concern (APC) where impacts may have arisen from historic events. • Potential sources of radioactive land quality issues are primarily associated with the surge chamber, the active effluent discharge line and a minor leak of active liquor from the pond. • Potential sources of chemical land quality issues are primarily associated with leaks of transformer oils into soakaways, which may have contained traces of Poly-Chlorinated Biphenyls (PCBs). • Site investigations are ongoing and routine monitoring is in place. 	<p>Magnox South (2010) Sizewell A EIAB</p>
<p>Surface Water Resources and Quality</p>	<ul style="list-style-type: none"> • The nearest water course to Sizewell A Site is Leiston Brook, a tributary of the Minsmere River ¹. • The quality of the bathing waters in the North Sea in the site's locality is considered to be moderate, being listed as being at the minimum pass standard. However, the nearest sampling point was situated near Southwold (approximately 10km to the north), so may not accurately reflect the water quality immediately adjacent to the site ². • The site is situated in Flood Zone 1 (so would be affected by floods less frequent than 1 in 1000 years), but is entirely surrounded by Flood Zone 3 (more frequent than 1 in 200) ⁴. • Aqueous effluent discharges (and cooling water discharges during the operational phase) have always been made to the North Sea, via a bell mouth upstand attached to the discharge culvert ³. • The dispersion characteristics of the North Sea are affected by factors including flow rate, sediment load, sedimentation rate, tidal range and atmospheric conditions. • Waterbodies containing clay mineral-rich sediments may have higher uptake potential for radionuclide anions such as Cs-137. 	<p>1. Ordnance Survey (2011) 1:25,000 Sheet 212, Woodbridge and Saxmundham 2. Environment Agency (2011) Bathing Water Quality 3. British Energy (2008) Environmental Product Declaration of Electricity from Sizewell B Nuclear Power Station –</p>

	<ul style="list-style-type: none"> The modelled dispersion of active effluent from Sizewell A via a dedicated discharge line and spray bar arrangements to the point of discharge was demonstrated to provide adequate dilution, equivalent to the operational dilution factor. 	<p>Technical Report. 4. Magnox South (2010) Sizewell A EIAB</p>
Waste	<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 Sizewell 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 Sizewell 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 FSC¹. <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 Sizewell A Site. This is supported by generic and site-specific options studies, but will also be subject to regulatory approval. The Magnox FED waste stream, which has a volume of 286m³, has the highest Safety and Environment Detriment Score at Sizewell A Site (after the spent nuclear fuel, which is being progressively discharged from the site)². A Best Practicable Environmental Option (BPEO) study has identified dissolution as the preferred management option for this waste stream. 	<p>1. Magnox Ltd. (2011) Sizewell A Site IWS s Overview 2. Walters S (2009) Fuel Element Debris Status</p>
Traffic and Transport	<ul style="list-style-type: none"> The site access road connects to the B1122 via Lover's Land and the C228. This road links to the A12, which gives access to the national motorway network at Jct. 28, M25 to the south, and at Jct. 17 A1(M) via the A47 and A1139 to the north. The nearest railhead to Sizewell A Site is located on the Aldeburgh Branch Line (which is used almost exclusively by nuclear flask trains servicing the power station). The nearest passenger rail station is located at Saxmundham. 	<p>Ordnance Survey (2011) 1:25,000 Sheet 212, Woodbridge and Saxmundham</p>
Land Use and Material Assets	<ul style="list-style-type: none"> Sizewell A Site occupies an area of 10 hectares¹. The adjacent Sizewell B Site occupies an area of 42 hectares². 117 hectares of land have been nominated for development into a potential 'C' site³. The site consists of one combined reactor building, turbine hall, various ancillary buildings, access roads, shingle areas, a small amount of grassed ground, and areas of hardstanding. The surrounding area is rural in nature and is used primarily for agricultural and recreational purposes. Notable uses in proximity to Sizewell A Site include the Suffolk Coastal Footpath that runs immediately 	<p>1. Magnox Ltd (2011) Sizewell A – Facts and Figures. Available at http://www.magnoxsites.co.uk/our-sites/sizewell-a/facts-and-figures</p>

	<p>alongside the site footprint to the east. The beach adjoining the site is also extensively used by the public throughout the year.</p> <ul style="list-style-type: none"> • Sizewell 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, the boilers, the gas ducts, the SPVs, and as rebar incorporated into large concrete structures such as the bioshield⁴. • A proportion of this recyclable metal will be made available for recycling during the C&MP phase, such as the turbine hall deplanting and demolition and other general building dismantling. • 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 UK Geological Disposal Facility, GDF), but the remainder will be LLW or exempt, and as such eligible for recycling and reuse within or outwith the nuclear industry⁴. • 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 similar⁴. 	<p>2. British Energy (2008) Environmental Product Declaration of Electricity from Sizewell B Nuclear Power Station – Technical Report 3. DECC (2011) National Policy Statement for Nuclear Power Generation (EN-6), Vol. II 4. Magnox Ltd. (2011) Sizewell A Site IWS</p>
<p>Noise and Vibration</p>	<ul style="list-style-type: none"> • The Baseline Noise Survey Data ($L_{Aeq\ 1\ hour}$, dB(A) (Daytime)) (both A and B Site generating, 2004) is as follows: <ul style="list-style-type: none"> • North Cottage (Sizewell) – 52.4 • Rosary Cottage – 51.7 • Coastguard Cottages – 53.1 • Timber Top – 53.4 • Home Farm – 54.5 • Cliff House – 48.4 • Sizewell Hall – 45.0 • Reckham Lodge – 49.1 • Keepers Cottage – 47.4 • Halfway Cottages – 63.1 • Caravan Site – 45.2 • Leiston Abbey – 41.1 • Wrayfields – 50.5 • The Studio – 51.9 • The Wilderness – 53.0 • Common Farm – 60.6 • King Georges Avenue – 62.0 • Crown Lodge – 63.7 • Common Farm Cottages – 55.5 • Sizewell Beach North – 47.6 • Sizewell Beach South – 54.9¹ • 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. 	<p>Magnox Ltd. (2010) Sizewell A EIAB</p>

	<ul style="list-style-type: none"> Noise and vibration originate from a number of sources at Sizewell A Site. Since the cessation of generation the profile of noise and vibration from the site has changed; at the current time this is not significant but as decommissioning activities increase noise levels are likely to do so in addition. 	
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Table 2: Environmental Discharge Data for Baseline Years 2008 – 10 for Sizewell A Site

In addition to the baseline information, which describes the permanent, semi-permanent and inherent features and impacts of Sizewell 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 Sizewell A Site to atmosphere in 2008: <ul style="list-style-type: none"> 0.659 TBq of H-3 (19 % of annual limits) 0.0464 TBq of C-14 (2.3 % of annual limits) 0.00202 TBq of S-35 (<1 % of annual limits)¹. These discharges were assessed to result in doses to the critical group of 6 µSv (from consumption of milk and vegetables, with infants as the most exposed group; 0.6 % 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. Once defuelling is complete and 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 pond 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 	<ol style="list-style-type: none"> FSA (2009) Radioactivity in Food and the Environment 14 Magnox North and South (2008) Monitoring Our Environment

		<p>remaining structures are demolished.</p> <ul style="list-style-type: none"> • 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 the impact from this is likely to be limited. 	
Global Climate Change and Energy	<ul style="list-style-type: none"> • In 2010 20247 MWh of energy was used at Sizewell A Site ¹. • This energy consumption resulted in the indirect emission of 6244 tonnes of CO₂. • 12.1 tonnes of CO₂ emissions were associated with other indirect sources. • Use of the boilers resulted in the direct emission of 3008 tonnes of CO₂ ¹. • This gives a gross emission figure of 9252 tonnes of CO₂ ¹. 	<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. 	1. Magnox Ltd. (2010) Sizewell A NSP10
Surface Water Resources and Quality	<ul style="list-style-type: none"> • The following describes the composition of radionuclides comprising the total radioactivity released by Sizewell A Site to the marine environment in 2008: <ul style="list-style-type: none"> • 0.145 TBq of H-3 (1.3 % of annual limits) • 0.177 TBq of Cs-137 (18 % of annual limits) • 0.111 TBq of other radionuclides (16 % of annual limits) ¹. • These discharges were assessed to result in doses to the critical group of 3.8 µSv (from external exposure and consumption of seafood; 0.38 % of the public dose limit) ². 	<ul style="list-style-type: none"> • Discharges of aqueous radioactivity will begin to decrease significantly upon the completion of the defuelling and the dispatch of all the spent fuel to Sellafield. • As decommissioning progresses through the C&MP phase the trend will likely be for discharges 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 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 	<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 3. Hunt C. (2011) BPM for Water Management during C&M, Bradwell Site, BRAD/BPM/017 ^b

^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.

		<p>that percolating ground- and rainwater may entrain and mobilise activity from contaminated structures such as areas of the Safestore buildings³. 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> <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. 	
Waste	<ul style="list-style-type: none"> The following waste metrics are for 2010: Sizewell A Site produced 9.97m³ of LLW from decommissioning activities which has been reused, recycled or disposed of¹. 6.84 m³ of this total was combustible LLW which was treated¹. 6.15 tonnes of inert waste was produced by the site from decommissioning activities. 100% of this total was recycled¹. 612.8 tonnes of non-hazardous waste was produced from decommissioning activities. 83.7% of this total was recycled¹. Both Reactors 1 and 2 are partially fuelled. Progress with defuelling is dictated by the available capacity of the Magnox Reprocessing Plant, given that spent fuel is being discharged from multiple sites². 	<ul style="list-style-type: none"> The anticipated future arisings of radioactive and conventional waste are outlined in Table 4. 	<ol style="list-style-type: none"> Magnox South (2010) Nuclear Industry Sector Plan, Waste Metrics Magnox Ltd. (2011) Sizewell A Site IWS

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

Table 3: Additional Data for baseline Year 2008 – 10 for Sizewell 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 38808 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) Sizewell A NSP10
Economy, Society and Skills	<ul style="list-style-type: none"> Sizewell A Site is located in the rural area of Suffolk Coastal District in the county of Suffolk ¹. The major settlements within 10km of the site are Leiston and Saxmundham to the west and Aldeburgh to the south, as well as a number of smaller settlements in addition. The population of the Suffolk Coastal District was 124300 during 2010 ². The Suffolk Coastal District had a working population of 59700 during 2010 ². <ul style="list-style-type: none"> The dominant working sectors in the Suffolk Coastal District during 2008 were Transport and Communications (10500, 22 %), Public Administration, Education and Health (10300, 22 %) and Distribution, Hotel and Restaurants (10000, 21.4%) <ul style="list-style-type: none"> In December 2010, 331 staff, 31 project staff and contractors* were directly employed by Sizewell A Site ³. Employment in the Electricity, Gas and Water Supply industry in the Suffolk Coastal District was not listed, but the effect of employment at Sizewell A Site is likely to be low against the total working population of this district. In 2010 (25700, 35.2 %) of the population were employed to NVQ4 level or above. The Suffolk Coastal District is not subject to 	<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. 	1. Ordnance Survey (2011) 1:25,000 Sheet 212, Woodbridge and Saxmundham 2. Office for National Statistics (2011) Official Labour Market Statistics, available at http://www.nomisweb.co.uk/ 3. Magnox Ltd (2011) Industrial Safety Stats @ December 2010 4. EU (2011) Cohesion Policy 2007 – 13, available at http://ec.europa.eu/regional_policy/atlas2007/index_en.htm

	<p>Convergence Funding from the European Union, or other external assistance ⁴.</p> <p>* Contractor numbers are variable, depending on the work being undertaken at the site.</p>		
Traffic and Transport	<ul style="list-style-type: none"> The Annual Average Daily Traffic (AADT) from all traffic movements on the A1094 (a route connecting the site to the A12) from recent measurements was 8679, of which 278 were Heavy Goods Vehicle (HGV) movements. On the A12 to the south of Saxmundham, on the route towards London and the national motorway network, the AADT from all traffic movements was 14436, of which 904 were HGV movements. This was the most local count point that was available. The proportion of these total movements that are directly attributable to Sizewell 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 Sizewell 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>
Health and Safety	<ul style="list-style-type: none"> Sizewell A Site had 2 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 Sizewell A Site in 2010 was 0.23 	<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 Sizewell A Site ^c

Category of Waste	Time of Arising	Unpackaged Volume (m ³)
LLW	C&MP	3205.4
	C&M	130
	FSC	25848.2
ILW	C&MP	1022.7
	C&M	0
	FSC	4025.4
Inert, hazardous and non-hazardous conventional	C&MP	64195.7
	C&M	5.6
	FSC	47584.2

(Sizewell A Site IWS, 2011)

Main Environmental Issue for Sizewell A Site

Land Quality

- Sizewell A Site does not contain any contaminated land as defined by Part IIA of the Environmental Protection Act 1990.
- There are however several minor APCs that have arisen from historic events, as well as very limited areas of known contamination (radioactive and chemical) that have either undergone remediation or are managed through the site Land Quality Strategy.
- The details of radioactive land quality issues are as follows:

^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).

- An area of ground became contaminated due to a leak of active liquor from the pond. The contamination resulting from this event primarily affected the pond building structure, but an area of tarmac became surface contaminated. This land quality issue was considered minor, and was remediated by removal of the tarmac.
- A leak in the active effluent discharge line led to contamination of the secondary containment. This containment structure remained intact, so the potential land quality issue that has arisen is considered minor.
- Contamination of the surge chamber has arisen due to aerial deposition of radionuclides. The resulting land quality issue has been partially remediated by the removal of contaminated sand, and a new discharge line was installed to prevent further events of this nature occurring.
- Further minor contamination is potentially present beneath building footprints or beneath the active discharge line, but sampling to ascertain the extent is not practical until decommissioning of those structures can be undertaken.
- Potentially chemically contaminated land is associated with:
 - The use of hydrocarbons around the site and associated minor spillages and leaks. This contamination is primarily associated with redundant tanks and fixed motors.
 - Traces of PCBs, which were used in various parts of the site's electrical infrastructure.
- Site investigation of these APCs is ongoing, and monitoring is carried out on a routine basis.

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 on the most suitable method used at other Magnox sites.
- If this process is implemented, the resultant effluent will be discharged to the North Sea 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.

Climate Change and Flooding

- As with all of the coastal Magnox Sites an ongoing issue for Sizewell A during C&M 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. Although the site is significantly elevated above the current sea level, the effect of sea level rise could potentially be exacerbated by the susceptibility of this stretch of Suffolk coast to erosion by wave action.
 - The C&M phase at the site, during which the reactors will be in Safestore, is scheduled to last until 2088, 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 approximately 9m above Ordnance Datum (mAOD), and is protected from flooding and erosion by soft defences comprising a

line of relict, vegetated sand dunes which were remodelled to provide a two-layered defence, consisting of a 10mAOD inner ridge and 5mAOD outer ridge ².

- Any further measures necessary to prevent flooding of the site during the C&M period, such as improvements to the flood defences (or similar), will be identified through the Periodic Safety Review. 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/spmsspmpm-projections-of.html
2. Magnox Ltd. (2010) Sizewell A Site EIAB

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

