# Wylfa Site

# Strategic Environmental Assessment Site Specific Baseline

**September 2014**

# 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 – September 2014

Wylfa Site
Cemaes
Ynys Môn (Anglesey)
LL67 0DH

## Wylfa Site

Wylfa Site (hereafter referred to as the site) is an operational twin reactor Magnox station located on the north coast of the Isle of Anglesey, North Wales. It is located adjacent to a headland on the Irish Sea coast from which it draws cooling water supplies. This power station site covers an area of 21 hectares.[1] The following describes the key dates for the site:

- Construction of the site commenced in 1963, and electricity was first supplied to the grid in 1971. It was the final, largest and most powerful station constructed as part of the Magnox programme.[1]
- The site is currently planned to cease electricity generation in 2014[a] after 43 years of operation.[2] This extension of generation has been achieved following the permanent shutdown of Reactor 2 in 2012, and the subsequent transfer of irradiated fuel to Reactor 1 thus optimising the use of this remaining fuel.
- Defuelling of the reactors is scheduled to be completed by 2016.[3]
- 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) phase.[3a]
- 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 2101.[3]

*1. Magnox Ltd (2013) Wylfa. Available at http://www.magnoxsites.co.uk/site/wylfa/*
*2. Magnox Ltd (2013) – S-036 Integrated Decommissioning and Waste Management Strategy Issue 4*
*3. Nuclear Decommissioning Authority (NDA) Business Plan, 2012-2015*

[a] *Wylfa will be the last Magnox site to be defueled and as such forms the final part of the Magnox Operating Plan. Due to this, the exact date that the site will be declared fuel free may be subject to some change according to progress made at other defuelling sites and the availability of reprocessing capacity at Sellafield.*

## Site End State Assumption

The planned end state for Wylfa 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 Wylfa Site

| SEA Objective | Environmental Baseline Data | References |
|---|---|---|
| **Air Quality & Dust** | *Radioactive Discharges*<br>• As one of the later Magnox stations, Wylfa's reactor cores are enclosed within Pre-stressed Concrete Pressure Vessels (PCPVs), which also serve as radiation 'bioshields', so airborne activation products are not produced and vented from the bioshield continuously as part of ordinary operations.<br>• Periodic venting of reactor coolant gas is carried out as part of operations, including refuelling of the reactors. This will cease soon after cessation of generation, scheduled to end in 2014.<br>• Nuclear operations such as waste retrieval and use of the active waste incinerator that occur during operations and also as part of decommissioning works result in minor but regular aerial discharges of radioactivity.<br><br>*Conventional Discharges*<br>• Vehicles, diesel driven generators / pumps and gas turbines are employed on the site, which are sources of air quality contaminants including $NO_x$ (oxides of nitrogen), $SO_x$ (oxides of sulphur), and $PM_{10}$ (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.<br>• Discharges from these sources will likely remain steady throughout the C&MP phase.<br>• Dust will be generated from construction and demolition activities undertaken on the site as part of C&MP. Mitigation of this dust will be undertaken.<br>• The location of the site is not currently designated an Air Quality Management Area (AQMA).[1] | *1. DEFRA (2014) Air Quality, http://aqma.defra.gov.uk/aqma/list.php* |

| | | |
|---|---|---|
| **Global Climate Change and Energy** | • Throughout its lifetime the site has drawn power from the National Grid to satisfy domestic power needs. The use of this energy during periods of non-generation has resulted in indirect $CO_2$ emissions, due to the mixed generation used in the UK.<br>• In addition to grid supplies, the site has several essential items of plant for the provision of back-up power that are fossil fuel powered. This auxiliary equipment consists of gas turbines, diesel generators and diesel-driven fire pumps. These machines are not in constant use; instead they are there for emergencies, but are regularly run for testing purposes.<br>• A number of vehicles are based at the site which are either used within the site footprint or move from the site to further afield (e.g. vehicles used in carrying out the District Survey), and have associated carbon emissions. Indirect carbon emissions originate from the use of hire vehicles by site personnel when travelling on company business.<br>• The site incinerator, which is used for the management of combustible LLW, is also a source of $CO_2$ emissions.<br>• Magnox Ltd. has registered under the Carbon Reduction Commitment (CRC) and also has a company-wide Energy Efficiency Policy. The policy is being implemented on a site by site basis, with the aim of minimising greenhouse gas emissions across the company.<br>• Additionally, Wylfa's combustion plant is covered by the EU Emissions Trading Scheme, this plant will be retained until the end of defuelling, at which point diesel generators will be used for the back-up supply function.<br><br>*Climate Change and Flooding*<br><br>• As with all of the coastal Magnox Sites an on-going issue for Wylfa 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 coastal situation of the site.<br>• The C&M phase at the site, during which the reactors will be in Safestore, is scheduled to last until 2092, 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 1980-99 levels).[1] Different areas of the site are situated at 3 different levels, all of which are significantly above sea level: the switch houses are at 16-20m Ordnance Datum (mAOD), the reactor block and turbine hall at 10-14 mAOD, and the cooling water pump house slopes from 10 – 6 mAOD [2]. As such, the areas of the site containing radioactive materials are situated well above sea level. The flood defences at the site consist of a shallow gradient rock foreshore which is topped off by a sea wall in localised areas. The high integrity of the cliffs at Wylfa Head generally negate the need for additional defences.[1]<br>• Any further measures necessary to prevent flooding of the site during the C&M period, such as improvements to the flood | *1. IPCC (2007) Projections of Future Change in Climate, http://www.ipcc.ch/publications_and_data/ar4/wg1/en/spmsspm-projections-of.html* |

| | | |
|---|---|---|
| | defences, 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. | |
| **Biodiversity, Flora and Fauna** | • The site is situated in a rural setting, and has 9 designated areas in close proximity.<br>• These designated areas are:<br>  ○ Ynys Feurig, Cemlyn Bay and The Skerries Special Protection Area (SPA)<br>  ○ Ynys Feurig, Cemlyn Bay and The Skerries Site of Special Scientific Interest (SSSI)<br>  ○ Cemlyn Bay Special Area of Conservation (SAC)<br>  ○ Isle of Anglesey Area of Outstanding Natural Beauty (AONB)<br>  ○ Tre'r Gof SSSI<br>  ○ Cemlyn Bay SSSI<br>  ○ Cae Gwyn SSSI<br>  ○ Llyn Llygeirian SSSI<br>  ○ Henborth Geological SSSI.[1]<br>• Due to these designations the coastline adjacent to the site is also classified as a European Marine Site.[b]<br>• The site Biodiversity Action Plan considers how the site manages its impacts on local ecosystems.<br>• 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. [2] | *1. Magnox North (2008) Wylfa Site EIADR Environmental Statement (ES)*<br>*2. Environment Agency (2002) Impact Assessment of Ionising Radiation on Wildlife* |
| **Landscape and Visual** | • The site is located on the north coastline of the Isle of Anglesey.[1]<br>• Rocky outcrops forming small cliffs up to 15m Above Ordnance Datum comprises the shoreline to the east and west of the site. The landscape surrounding the site is generally undulating or flat and semi-open with areas of woodland and small flat agricultural fields.[2]<br>• The reactor buildings and other site structures are highly visible from vistas throughout the surrounding countryside and along the coastline at short distances, and are less obtrusive at medium-long distances.[2] | *1. Ordnance Survey (2011) 1:25,000 Sheet 262, Anglesey West*<br>*2. Magnox North (2008) Wylfa Site EIADR Environmental Statement (ES)* |

[b] *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.*

| | | |
|---|---|---|
| **Archaeology & Cultural Heritage** | • There is 1 Scheduled Ancient Monument near to the site, at Llanfechell.<br>• There are 3 Listed Buildings near to the site, which are all Grade II and situated in close proximity to the site.<br>• There is 1 entry in the draft Register of Landscapes, Parks and Gardens of Special Historic Interest near to the site (Cestyll Gardens, which is in close proximity to the site), as listed by Countryside Council for Wales.[1]<br>• The reactors at the site are the largest and most powerful of the Magnox type so represent the culmination of the design, and so paved the way for the subsequent AGR Programme. Despite this important industrial heritage, there are no known plans to preserve any physical part of the station after shutdown. | *1. Magnox North (2008) Wylfa Site EIADR ES* |
| **Groundwater, Geology and Soils** | • Made Ground underlies a portion of the site itself, and consists of reworked till and bedrock. The natural superficial deposits in the site locality consist of Glacial Till. This consists of two predominant types of drift deposit; one being silty gravelly clay and a localised sand / gravel. Peat is also found throughout the till.<br>• The bedrock at the site consists of the pre-Cambrian New Harbour Group of the Mona Complex. This Group consists of a sequence of metamorphosed sediments dominated by mica-schist, phyllites, jasper and pelitic lava. To the immediate north west of the site, at Wylfa Head the bedrock consists of the Gwna Group which includes phyllite, quartzite, jasper, lavas and tuffs. Faulting and crush zones have resulted in a complex amalgamation of these rocks underneath the site. Outcrops of extrusive igneous material are present to the south of the turbine hall, to the west of the station, and in Wylfa Head.<br>• The superficial deposits at the site are considered a non aquifer, with the exception of a small area to the east of the site which is classified as Minor aquifer. It is believed that perched groundwater may be present in the Made Ground on site.<br>• The bedrock at the site is considered a non aquifer. However, it is believed that entry and movement of groundwater occurs in the rock via fractures, faults and crush zones.<br>• The shallow aquifer in the drift deposits are locally abstracted for agricultural use, and additionally springs are marked on maps of the area.<br>• The soil in the area surrounding the site is classified as a sandy loam.[1]<br><br>*Land Quality*<br>• Land quality at the site is of low concern due to limited radioactive and non-radioactive contamination.<br>• There have been successive but limited sampling campaigns at the site that have confirmed that contamination is not severe or widespread on the site or on the surrounds. | *1. Magnox North (2008) Wylfa Site EIADR Environmental Statement* |

| | | |
|---|---|---|
| | • Due to the lack of a continuous water table beneath the site there is no scheduled groundwater monitoring programme at the site. This is considered acceptable in light of the low levels of contamination present at the site.<br>• Characterisation did identify points of note relating to chemical contamination. Organic and inorganic species were found to be below guideline levels, but hydrocarbons were detectable in soils samples taken to the rear of the gas turbine fuel tanks and adjacent to the former sewage works.<br>• The site shall continue to manage land quality through the production and maintenance of a Land Quality file, Land Quality Characterisation Plan and Land Quality Strategy.<br>• The site will also maintain and monitor appropriate arrangements for the control of work that could affect areas of land contamination.<br>• A major factor in the near-absence of radioactive contamination at the site is the fact that there are no fuel cooling ponds at the site (a dry storage cell system is used instead), which have proved at some other Magnox sites to be a significant source of radioactive ground and groundwater contamination. | |
| **Surface Water Resources and Quality** | • The nearest water body to the site is the Irish Sea, to the immediate north. The Afon Wygyr drains the land to the south and east of the site, and a small spring-fed stream is located to the south of the site, which flows towards Poth-y-Pistyll [1].<br>• The Bathing Water quality on the Anglesey coastline in the site's locality is considered good. The nearest sampling point is situated approximately 4km to the east at Cemaes Bay, and was considered to be of higher quality. [2] This point is situated at a distance from the site, so may not accurately reflect water quality immediately adjacent to the site.<br>• A 1 in 10,000 water level on the adjacent coast would equate to 9.4mAOD, which would not affect the majority of the site which is situated at 12mAOD (the cooling water inlets would be affected but this would not compromise nuclear safety).<br>• Aqueous effluent discharges and cooling water discharges are made via a culvert at the northeast of the site to the Irish Sea. Dispersion of the active effluent is currently provided by the high flow rate of the Cooling Water; plans are already in place to put alternative arrangements in place for effluent dispersal when the generation phase ceases and the flow of Cooling Water is shut off. This will consist of a new, dedicated active effluent discharge line which will which will provide dispersion characteristics as good as or better than the existing system. | *1. Magnox North (2008) Wylfa Site EIADR Environmental Statement*<br>*2. Environment Agency (2011) Bathing Water Quality* |

| | | |
|---|---|---|
| **Waste** | • Both operational and decommissioning activities at nuclear sites generate radioactive and conventional waste.<br>• LLW is generated at the site from a range of routine operational and decommissioning activities, and comprises a range of different materials.<br>• The baseline for LLW is to incinerate on site where possible (for combustible LLW), and to package non-incinerable waste and send it to the Low Level Waste Repository (LLWR) near Drigg in Cumbria for disposal.[1]<br>• Opportunities to characterise or decontaminate to Very Low Level Waste (VLLW, for controlled burial) or exempt (for permitted landfill), size reduce, incinerate or metal melt, in order to reduce LLWR consignments are actively sought.<br>• Intermediate Level Waste (ILW) is generated from both operational and decommissioning activities. It has accumulated at several locations at the site. Where appropriate, ILW will be retrieved during C&MP when ILW storage facilities become available on site. The exception to this are some Miscellaneous Activated Components (MAC) stored in vaults in the PCPVs which will be retrieved during FSC.<br><br>*Site Waste Strategy Baseline*<br><br>• The use of self-shielding Ductile Cast Iron Containers (DCICs) for interim storage and eventual final disposal of solid and wet ILW has been developed by Magnox Ltd., and is planned to be implemented at the site. This is supported by generic and site-specific options studies, but will also be subject to regulatory approval.<br>• The waste packages will be emplaced in on-site storage facilities (either a dedicated storage building, or potentially given the low anticipated number of packages, in other existing spaces such as within the reactor building) during the interim period pending eventual phased transfer to the UK national Geological Disposal Facility (GDF) circa 2040 (but possibly as early as 2029) [2].<br>• The absence of a ponds complex at Wylfa, which have been major sources of contamination at several Magnox Sites, and a major potential radiological hazard in general, has never been present on this site. Also, the need for one major decommissioning effort at the site is not there, and although the dry cell will require decommissioning, the levels of contamination there should be considerably lower than that found within pond structures at other Magnox Sites.<br>• As no Magnox FED has been accumulated at Wylfa, no consideration is required for the retrieval, containerisation, or dissolution and discharge of this material. | *1. Magnox Ltd (2011) Wylfa IWS*<br>*2. DECC (2011) Implementing Geological Disposal Annual Report April 2010 – March 2011* |

| | | |
|---|---|---|
| **Traffic and Transport** | • The site access road connects directly to the A5025. This road links to the national motorway network at Jct. 12, M53 via the A55 trunk road (North Wales Expressway).[1]<br>• The nearest railhead to the site is located on the North Wales Coast Line, near to Valley Railway station.[2] This fully operational line runs regular passenger and freight services. The nearest passenger rail stations are at Holyhead and Valley.[2] | *1. Ordnance Survey (2011) 1:25,000 Sheet 262, Anglesey West*<br>*2. Magnox North (2008) Wylfa Site EIADR Environmental Statement (ES)* |
| **Land Use and Material Assets** | • The site occupies an area of 21 hectares on an overall NDA estate of 113 hectares.[1]<br>• 232 hectares of NDA-owned land has been sold to Horizon Nuclear Power for the potential future construction of a 'B' power station site.[2]<br>• The site consists of a single reactor block, turbine hall, dry fuel storage buildings, various ancillary buildings, access roads, grassy areas and areas of hardstanding.<br>• The surrounding area is rural in nature and is used primarily for agricultural and recreational purposes<br>• Notable uses in proximity to the site include the Anglesey Coastal Footpath, which passes to the immediate east and south of the site footprint.[3]<br>• The site incorporates a significant quantity of material that is potentially eligible for direct reuse or recycling once generation has ceased and the site is undergoing decommissioning:<br>• This includes a substantial quantity of recyclable metal in the turbine hall, the reactor internals (boilers, pressure vessel liner) and incorporated into the PCPVs (stressing cables, Pressure Vessel Cooling System pipework), and large metallic devices such as the gas circulators and steam turbines.[1]<br>• 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.<br>• The PCPVs and their contents will be dismantled at FSC, so a significant quantity 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 exempt, and as such eligible for recycling and reuse within or outwith the nuclear industry.[1]<br>• 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.[4] | *1. NDA (2011) Strategy Document*<br>*2. Horizon Nuclear Power (2011) http://www.horizonnuclearpower.com/wylfa*<br>*3. Ordnance Survey (2011) 1:25,000 Sheet 262, Anglesey West*<br>*4. Magnox Ltd. (2011) Wylfa Site IWS* |

| | | |
|---|---|---|
| **Noise and Vibration** | • Noise and vibration originate from a number of sources at the site.<br>• The Baseline Noise Survey Data ($L_{Aeq}$, dB(A), Wylfa generating, 2008) is as follows:<br>  ○ The Firs / Tregele – 50.4<br>  ○ Cafnan – 55.2<br>  ○ Haul-a-Gwynt – 37.7<br>  ○ Cemaes Bay – 39.3.[1]<br>• 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.<br>• The site continues to undertake baseline monitoring to ensure that noise remains at an acceptable level.<br>• Upon the cessation of generation the profile of noise and vibration from the site will change, but will remain significant due to the nature of decommissioning works. | *1. Magnox North (2008) Wylfa Site EIADR Environmental Statement (ES)* |

## Table 2: Environmental Discharge Data for Baseline Years 2012/13 for Wylfa Site

In addition to the baseline information, which describes the permanent, semi-permanent and inherent features and impacts of the site and its surrounding area, the following table outlines discharge data for the site for the years 2012 and 2013[c], 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 & Dust** | • In 2012 Alpha discharges to air from the site were <1.3E-05 TBq and were below the reporting threshold in 2013.<br>• In 2012 Beta/Gamma (excluding Tritium) to air were 1.01E+01 TBq and 9.57E+00 TBq in 2013.<br>• Tritium discharges to air were 2.14E+00 TBq in 2012 and 1.02E+00 TBq in 2013.[1]<br><br>The total dose from all pathways and sources of radiation was 0.006 mSv in 2012, which was 0.6 per cent of the dose limit, and down from 0.008 mSv 2011. The most exposed people were local adults consuming marine plants and algae. The decrease in total dose (from 2011) was mostly due to lower external exposure over intertidal areas in 2012. Total doses remained broadly similar from year to year, and were low.[2] | • Discharges of radioactivity to the atmosphere will decrease significantly upon the cessation of generation.<br>• As decommissioning progresses through the C&MP phase the trend will be for discharges to remain steady or continue to decrease.<br>• However, certain decommissioning activities such as the retrieval, treatment and passivation of wastes may result in short term spikes in aerial discharges of radioactivity.<br>• 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.<br>• The degassing of desiccant material in storage, the PCPV and core graphite may result in very minor discharges of tritium.<br>• Dust from demolition and traffic movement may affect the local area during all 3 decommissioning phases. | *1. Magnox 2012 and 2013 Nuclear Industry Sector Plan (NISP) Submissions*<br>*2. CEFAS (Centre for Environment, Fisheries and Aquaculture Science) (2012) Radioactivity in Food and the Environment 18.* |

[c] *Data from 2012 and 2013 are presented to provide an indication of variances.*

| | | | |
|---|---|---|---|
| | | Civil works will be a source of dust.<br>• 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.<br>• Retrieval of waste packages from site for transfer to the GDF when it becomes available during the C&M phase will result in periodic 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** | • In 2012, 664911 MWh of energy was used at the site, and 677935 MWh in 2013.<br>• This figure is much higher than at defuelling / decommissioning sites due to 'works usage' i.e. energy consumed continuously by plant that facilitates generation such as the gas circulators and cooling water pumps. This power requirement is deducted from the output of the station.<br>• Use of the plant including the gas turbines and the incinerator resulted in the direct emission of 5.45E-03 megatonnes of CO2 in 2012 and 3.0E-03 in 2013.[1]<br>• In 2012, 2.4E-04 megatonnes of $CO_2$ were indirectly emitted from domestic energy consumption, compared with 3.2E-03 in 2013.[1] | • 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.<br>• 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.<br>• The retrieval of waste packages from the site ILW storage facilities 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.<br>• 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 $CO_2$ emissions relative to the present are unknown. | *1. Magnox 2012 and 2013 Nuclear Industry Sector Plan (NISP) Submissions* |

| | | | |
|---|---|---|---|
| **Surface Water Resources and Quality** | • In 2012 Alpha discharges to water from the site were 2.12E-04 TBq and 1.16E-06 TBq in 2013.<br>• In 2012 Beta/Gamma (excluding Tritium) to water were 7.33E-03 TBq and 3.59E-03 TBq in 2013.<br>• Tritium discharges to water were 2.87E+00 TBq in 2012 and 2.11E+00 TBq in 2013.[1]<br><br>Discharges of tritium decreased in comparison to releases in 2011 (due to power cessation). The monitoring programme for the effects of liquid disposals included sampling of fish, shellfish, sediment, seawater and measurements of gamma dose rates. The data for artificial radionuclides related to the Irish Sea continue to reflect the distant effects of Sellafield discharges. The activity concentrations in 2012 were similar to those in 2011, including technetium-99 derived from Sellafield. Caesium-137 concentrations in sediment have remained low over the last decade. Where comparisons can be made (from similar ground types and locations), gamma dose rates were generally lower in comparison to those in 2011.[2] | • Discharges of aqueous radioactivity will decrease significantly upon the cessation of generation.<br>• As decommissioning progresses through the C&MP phase the trend will be for discharges to continue to decrease.<br>• However, certain decommissioning activities such as the as the retrieval, treatment and passivation of wastes may result in short term spikes in aqueous discharges of radioactivity.<br>• 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 extremely low.<br>• 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. | *1. Magnox 2012 and 2013 Nuclear Industry Sector Plan (NISP) Submissions*<br>*2. CEFAS (Centre for Environment, Fisheries and Aquaculture Science) (2012) Radioactivity in Food and the Environment 18* |
| **Waste** | • The following waste metrics are for 2012 and 2013:<br>• In 2012 the Site produced 84m$^3$ of LLW from operational activities, all of which was treated.[1]<br>• In 2013 the site produced 82.55 m$^3$ of LLW from operational activities, all of which was treated.[1]<br>• In 2012 177.3 tonnes of inert waste was produced by the site from operational activities, of which 95% of this total was recycled.[1]<br>• 552.2 tonnes of non-hazardous waste was produced from | Until the end of generation, the trends for waste are anticipated to remain similar, however once the site moves into decommissioning the generation of waste will likely increase until site enters C&M when these levels will fall significantly. | 1. *Magnox 2012 and 2013 Nuclear Industry Sector Plan (NISP) Submissions* |

| | | | |
|---|---|---|---|
| | routine operational activities, of which 78% was recycled.[1]<br>• In 2013, 1277 tonnes of inert waste was produced by the site from operational activities, of which 99% of this total was recycled.[1]<br>• 747.4 tonnes of non-hazardous waste was produced from routine operational activities, of which 63% was recycled [1]. | | |

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

## Table 3: Additional Data for baseline Year 2012/13 for Wylfa Site

| SEA Objective | Additional Data | Changes in Additional Parameters | References |
|---|---|---|---|
| **Surface Water Resources and Quality** | • In 2012 the site consumed 507,555 $m^3$ of mains water reducing to 295,777 $m^3$ in 2013.<br>• This figure excludes cooling water, which is drawn directly from and returned to the Irish Sea via its own isolated cooling water (tertiary) circuit. | • Cooling water requirements will decrease significantly upon the cessation of generation, and will cease entirely after a period after shutdown.<br>• Town's water usage patterns will also change after shutdown, with a general decrease due to a reduced need for demineralised water (for the steam cycle) and reduced staff numbers.<br>• Water consumption will likely remain steady throughout C&MP, but drop to essentially zero once the site has entered C&M. | *1. Magnox 2012 and 2013 Nuclear Industry Sector Plan (NISP) Submissions* |
| **Economy, Society and Skills** | • The site is located in rural area of the Isle of Anglesey, North Wales.<br>• The nearest settlements within the locality of the site are Cemaes to the east and Llanfechell to the southeast, but | • The number of personnel employed on site will decrease significantly after the completion of C&MP.<br>• Personnel numbers at the site will increase again for the duration of FSC. | *1. Ordnance Survey (2011) 1:25,000 Sheet 262, Anglesey West*<br>*2. Office for National Statistics (2014) Official Labour Market Statistics, available at* |

| | | | |
|---|---|---|---|
| | there are no large settlements within 10km of the site (Holyhead is approximately 17km distant). There are numerous small villages and other settlements in the area in addition to these larger towns.[1]<br>• The population of Anglesey was 70100 during 2013.[2]<br>• Anglesey had a working population of 31700 during 2013.[2]<br>• The dominant working sectors in Anglesey during 2013 were Services (15800, 81.8 %) and Public Admin, Education and Health (5600, 29.2%)<br>• Employment in the Electricity, Gas and Water Supply industry in Anglesey was not listed, but employment at the site is likely to have a measureable effect against the total working population of this district.<br>• In 2013 (13300, 32.9%) of the population were employed to NVQ4 level or above.<br>• Anglesey is currently subject to Convergence Funding from the EU.[3]<br>• The number of personnel employed on site will decrease after the cessation of generation and again significantly after the completion of C&MP. | | *http://www.nomisweb.co.uk/*<br>*3. EU (2014) Cohesion Policy 2007 – 13, available at http://ec.europa.eu/regional_policy/atlas2007/index_en.htm* |
| **Traffic and Transport** | • The Annual Average Daily Traffic (AADT) from all traffic movements on the A5025 (at a point approximately 4km to the east of site) from recent measurements was 3378, of which 92 were Heavy Goods Vehicle (HGV) movements.<br>• On the A5025, to the southwest of the site close to the village of Valley the AADT from all traffic movements was 4932, of which 98 were HGV movements.[1]<br>• The proportion of these total movements that are directly | • It is anticipated that general traffic and HGV movements will remain steady or increase during the remainder of the C&MP phase at the site.<br>• Movement of materials for potential future projects e.g. delivery of DCICs to site and construction of ILW storage facilities will generate extra traffic movements, as will movement of demolition waste and other inert material for reuse or conventional disposal. | *1. Department for Transport (2014) AADF Home, available at: http://www.dft.gov.uk/matrix/search.aspx* |

| | | | |
|---|---|---|---|
| | attributable to the site is low. | • A similar increase in traffic flows on local roads can be expected for the duration of the FSC phase. | |

**Figure 1: Statutorily Designated Areas in the Vicinity of Wylfa Site**