DEPARTMENT OF ENERGY & CLIMATE CHANGE

Appendices to the Habitats Regulations Assessment Site Report for Wylfa

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

Planning for new energy infrastructure **October** 2010

Habitats Regulations Assessment of the revised draft Nuclear National Policy Statement

Habitats Regulations Assessment (HRA) screening and Appropriate Assessment (AA) of the revised draft Nuclear NPS including potentially suitable sites, has been undertaken in parallel with the Appraisal of Sustainability (AoS). These strategic assessments are part of an ongoing assessment process that will continue with project level assessments. Applications to the IPC for development consent will need to take account of the issues identified and recommendations made in the strategic, plan level HRA/AA; and include more detailed, project level HRA as necessary.

The Habitats Regulations Assessment is provided in the following documents:

HRA Non-Technical Summary

Main HRA Report of the revised draft Nuclear NPS

- Introduction
- Methods
- Findings

Annexes to the Main HRA Report: Reports on Sites

- Site HRA Reports
- Technical Appendices

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

This document is the Appendices to the HRA site report for Wylfa.

This document has been produced by the Department of Energy and Climate Change based on technical assessment undertaken by MWH UK Ltd with Enfusion Ltd and Nicholas Pearson Associates Ltd.

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Appendix 1: European Site Characterisations

Natura 2000 Site Identification					
Natura 2000 Designation	**Radius (measured from central grid reference point, MAGIC)**				
	5km	**10km**	**15km**	**20km**	**>20km**
SAC	• Cemlyn Bay	• None	• None	• Holy Island Coast • Anglesey Fens • Llnyn Dinam • Menai Strait and Conwy Bay	• Abermenai to Aberffraw Dunes • Afon Gwyrfai a Llyn Cwellyn • Anglesey Coast and Saltmarsh • Glan-traeth • Great Orme's Head • Snowdonia
SPA	• Ynys Feurig, Cemlyn Bay and The Skerries	• None	• None	• Holy Island Coast	• Lavan Sands • Liverpool Bay • Puffin Island
Ramsar	• None	• None	• None	• Anglesey and Llyn Fens	• None

Natura 2000 Site Characterisations

Special Areas of Conservation (SAC)[1]

1. Cemlyn Bay
2. Holy Island Coast
3. Anglesey Fens
4. Llnyn Dinam
5. Menai Strait and Conwy Bay
6. Abermenai to Aberffraw Dunes
7. Afon Gwyrfai a Llyn Cwellyn
8. Anglesey Coast and Saltmarsh
9. Glan-traeth
10. Great Orme's Head
11. Snowdonia

Special Protection Areas (SPA)[2]

1. Ynys Feurig, Cemlyn Bay and The Skerries SPA
2. Holy Island Coast
3. Lavan Sands, Conwy Bay
4. Puffin Island
5. Liverpool Bay

[1] **Special Areas of Conservation (SACs)** are classified under the Habitats Directive and provide rare and vulnerable animals, plants and habitats with increased protection and management

[2] **Special Protection Areas (SPAs)** are classified under the Birds Directive to help protect and manage areas which are important for rare and vulnerable birds because they use them for breeding, feeding, wintering or migration. Together SAC's and SPA's make up the Natura 2000 series

Ramsar Sites[3]

1. Anglesey and Llyn Fens

All core site specific information unless otherwise stated has been referenced from the Countryside Council for Wales and Natural England Sources (Natura 2000 Management Plans) (Nature on the Map) and the Joint Nature Conservation Committee website (Protected Sites).

[3] **Ramsar sites** are designated under the Convention on Wetlands of International Importance. The broad objectives are to stem the loss and progressive encroachment on wetlands now and in the future. These are often coincident with SPA sites designated under the Birds Directive. Although RAMSAR sites are not considered part of the Natura

Special Areas of Conservation

Site Name: Bae Cemlyn/Cemlyn Bay

- **Location: 043040W/532442N**
- **SAC EU Code UK0030114**
- **Size: 43.43 ha**
- **Designation: SAC**

	Bae Cemlyn/ Cemlyn Bay SAC
Site Description	Cemlyn lagoon lies on the north coast of Anglesey, North Wales, and is considered to be the best example of a saline coastal lagoon in Wales. The lagoon is separated from the sea by a shingle bank with a narrow channel at the western end, across which a sluice system was built in the 1930s. Seawater exchange occurs mainly through the sluice and by percolation through the shingle bank, although in extreme storms coinciding with spring tides waves break over the top of the shingle bank. Cemlyn lagoon supports a relatively diverse set of species, several of which are specific to lagoons, including the Bryozoan *Conopeum seurati*, the Lagoon cockle *Cerastoderma glaucum* and the Lagoonal mud-snail *Ventrosia ventrosa*. Cemlyn lagoon is also the only site in Wales where the lagoonal isopod *Idotea chelipes* has been recorded. A number of uncommon plant species are found within the lagoon, including the Brackish water-crowfoot *Ranunculus baudotii* and Beaked tasselweed *Ruppia maritima*.
Qualifying Features	Annex I habitats that are a primary reason for selection of this site: 1150 Coastal Lagoons Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: 1220 Perennial Vegetation of Stony Banks

	Bae Cemlyn/ Cemlyn Bay SAC
Conservation Objectives	The interest features will be considered to be in favourable conservation status when, subject to natural processes, each of the following conditions are satisfied: **Interest Feature 1: Coastal Lagoon** • There is no loss of area other than that due to natural processes. • The specialised plant and animal communities within the lagoon remain. • All factors affecting the achievement of these conditions are under control. **Interest Feature 2: Perennial Vegetation of Stony Banks** • The extent of the vegetation of shingle banks is maintained unless altered by natural (for example, storm events). • Typical component species of vegetation of shingle banks are maintained. • Invasive alien species (for example, *Fallopia japonica*) are absent. • The management of activities or operations likely to damage or degrade the population dynamics, natural range and supporting habitat of the feature is appropriate for maintaining favourable conservation status and is secure in the long-term.
Component SSSIs	• Ynys Feurig SSSI • The Skerries SSSI • Cemlyn Bay SSSI Maps containing the component SSSIs can be viewed on the CCW website: http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/bae-cemlyn--cemlyn-bay-sac.aspx
Key Environmental Conditions (factors that	**Coastal Lagoon** • Managing land use change in the catchment, for example, intensive dairy or arable farming have

	Bae Cemlyn/ Cemlyn Bay SAC
maintain site integrity)	the potential to influence water quality. Sediment load, chemical (nutrient) and organic pollution could affect the water quality within the lagoon. • Managing the freshwater inflow, seepage through the shingle and leakage through the weir to maintain the salinity balance within the lagoon. **Perennial Vegetation of Stony Banks** • The shingle ridge is maintained through a dynamic and generally cyclic process of deposition and erosion of the shingle. Structures or other intervention that interfere with this natural movement should be resisted. Removal of shingle to provide building materials must also be resisted.
SAC Condition Assessment	**Conservation status of Feature 1: Coastal Lagoon: Favourable maintained.** • The maintenance of the subtle mix of freshwater inflow, seepage through the shingle and leakage through the weir is essential to maintaining the salinity balance within the lagoon. • Stable land use in the catchment, influencing/maintaining water quality. **Conservation status of Feature 2: Perennial Vegetation of Stony Banks: Unfavourable.** • Due to the trampling of the vegetation, currently under investigation. • Maintenance of the shingle ridge through dynamic and generally cyclic process of deposition and erosion of the shingle.
Vulnerabilities (includes existing pressures and trends)	**Coastal Lagoon** In general, the pressures are Fish and Shellfish Aquaculture, Professional fishing, Fixed location fishing, Leisure fishing, Bait digging, Trampling, overuse, Invasion by a species, Interspecific faunal and floral relations, Genetic pollution, Urbanised areas, human habitation, Industrial or commercial areas, Discharges, Port areas, Energy transport, Pipelines, Shipping, Sport and leisure structures, nautical sports, pollution, water pollution, Dumping/depositing of dredged deposits, euthrophication, landfill/land reclamation and drying out, Polderisation, erosion, removal of sediments, management

	Bae Cemlyn/ Cemlyn Bay SAC
	of water levels, and reclamation of land from sea/estuary or marsh. **Fisheries** - The effects of fisheries include: (i) Removal of target species (including genetic effects) – given the size of most fish stocks the fishing pressure exerted upon them is outside safe biological limits. (ii) Mortality of non-target species. (iii) Physical disturbance of the seabed. (iv) Shifts in community structure. (v) Indirect effects on the food web. Commercial fisheries are rare in lagoons although some aquaculture does take place. Lagoons are more vulnerable to aquaculture related impacts than shallow inlets and bays or estuaries due to their restricted water exchange (Sewell and Hiscock 2005). In addition, some lagoons may contain commercial species of bivalves and algae as well as some invertebrate species commonly collected as fishing bait. There is, however, little information on how the exploitation of these resources affects the feature (Sewell and Hiscock 2005). In general, however, fisheries are therefore unlikely to represent the greatest anthropogenic threat to UK coastal lagoons. **Climate change -**Shoreline areas and the intertidal zone will be affected by sea level rise and an increase in storms and winds resulting in changes to the distribution and composition of some shoreline habitats. Changes in the length of growing and breeding seasons, community composition and species ranges are likely to continue. Increasing temperatures can alter the timing of ecological processes and there is therefore potential for temporal mismatch between trophic levels. Patterns of species response to climate change are not straightforward, due to factors such as current flow, which may also change, and barriers to species movement. Uncertainties exist for many predictions including: species specific responses to climate change; the capacity of species from different habitats to

	Bae Cemlyn/ Cemlyn Bay SAC
	migrate in response to a changing climate; the possible influx of new invasive species; the impact of increasing ocean acidity due to absorption of atmospheric CO_2.In addition, changes in certain activities as a result of climate change, in particular those caused by sea level rise could also have an impact on the marine environment. For example, managed retreat to enable persistence of some coastal habitats might be inhibited by coastal development and construction of sea defences, whilst changes in fishing policy will substantially alter the pressure on the marine biodiversity resource. **Non-Indigenous Species -** The deleterious impacts of Non-Indigenous Species (NIS) have been shown across global regions, habitat types, and taxonomic groups worldwide, including marine systems (Ruiz *et al*. 1997; Cohen and Carlton 1998; Ruiz *et al*. 2000). Within marine systems, ships' ballast water, used to improve ship stability and trim, is one of the primary mechanisms for the transport and introduction of non-indigenous marine species to ports worldwide (Carlton 1996). Given the continued growth of global trade and the complexity of shipping patterns globally, with numerous different source regions, ship types and routes operating worldwide, it is clear that NIS will continue to be transferred to UK waters for the foreseeable future. There is some legislation currently in place to reduce the introduction of NIS via Ballast Water through the International Maritime Organization (International Maritime Organization 2004). This legislation aims to limit the number of viable organisms within ballast tanks in the future, but NIS remain a grave concern, and could potentially lead to habitat alteration and biodiversity loss within marine Annex I habitat features. Our ability to predict invasions is severely limited by the complexity of the invasion process itself, and therefore it is difficult to identify those marine Annex I habitat features that are at greatest risk. Nonetheless, certain areas are known to be at a particularly high risk: I. Areas within the vicinity of ports. Because the marine environment is essentially an open system, there is also potential for rapid and widespread secondary transfer of NIS within the UK once species establish reproducing populations.

	Bae Cemlyn/ Cemlyn Bay SAC
	II. Areas with a high diversity of habitat types (including diversity of substrate, salinity and temperature regimes and exposure). These habitats are most likely to be successfully invaded because, as the number of habitat types increases, so does the chance that a particular species will locate a suitable habitat for its establishment. III. Areas already altered or damaged by anthropogenic effects. IV. Areas that have already been invaded by high numbers of NIS. V. Areas of low indigenous species richness. Brackish water conditions, for example, such as those found in estuaries generally support low diversity. For this feature, it is unlikely that we will be able to accurately predict which species will arrive, establish or what their impacts might be on native communities in the future. Though impacts can be minimal, they can also include massive population growth and subsequent displacement of native species. **Anthropogenic activity and coastal development -** The development of the coastal area or construction of hard defences of any kind in the region of coastal lagoons has the potential to greatly influence the feature, whose maintenance is dependent upon the existence of a delicate hydrological regime. Any development which leads to a change in this hydrographic regime, be it a change in the water exchange with the sea, or in the freshwater input into the system is of considerable concern. However, there is a presumption against coastal development in the UK which is described in the following documents: NPPG 13 (Scotland; Scottish Executive 1997); TAN 14 (Wales; Welsh Assembly 1998); and PPG 20 (England; Department of the Environment 1992). For example, the following is adapted from NPPG 13. “The presumption against development includes projects for which a coastal location is not required; projects that are approved should be accommodated on the developed coast, reuse available and suitable brownfield land, incorporate conservation interests and work within natural processes at work on the coast. In addition where potential damage to the environment is both uncertain and significant, a precautionary approach is required and the criteria required by the various bodies

	Bae Cemlyn/ Cemlyn Bay SAC
	responsible for environmental protection should be met". Thus, coastal development is not considered to be the most significant threat to coastal lagoons in the future. However, it should be noted that new lagoon formation is likely to be quite restricted now as a result of a lack of suitable sites due to past coastal development (Davidson *et al*. 1991). Moreover, lagoons are likely to be severely affected by agricultural run-off and percolation of pollutants from nearby existing developments. Pesticide run-off from gardens and agricultural land is a major concern, but even small quantities of pollutants resulting from dumping of waste in lagoons can have significant impacts due to the closed nature of lagoonal systems (Everett 1993). **Coastal erosion and sea level rise -** Sedimentary areas already protected by hard defences or bordered by developed land will suffer the greatest impact in the event of sea level rise (Boorman *et al*. 1989). The combined effects of coastal erosion, sea level rise and the high cost of maintaining sea defences in areas such as the south-east are matters of concern. There has been a decision in principle to work with natural sedimentary processes in managing these problems in the UK, but if relative sea level rise continues to occur at present rates, it will necessitate a number of difficult decisions and call for novel engineering solutions. It will also necessitate the establishment of an appropriate balance between managed retreat and construction of higher and stronger sea defences (Defra 2005). Rising sea levels and coastal erosion have the potential to dramatically alter and destroy coastal lagoons, which are dependent upon a delicate balance of hydrographic conditions. Flooding and inundation of lagoons could occur, particularly since erosion is predicted to become increasingly dominant (Boorman *et al.* 1989). **Air pollution** - Based on an assessment of relevant literature, this habitat is potentially sensitive to air pollution, but is has not been possible to undertake an assessment of potential impact based on critical loads because of the poor equivalence between this habitat and those for which critical loads are set.

	Bae Cemlyn/ Cemlyn Bay SAC
	Perennial Vegetation of Stony Banks **Sediment supply** - The health and ongoing development of a shingle feature depend on a continying supply of shingle. This may occur sporadically as a response to storm events rather than continuously. It is frequently lacking owing to interruption of coastal processes by coast defence structures, by offshore aggregate extraction or by artificial redistribution of material within the site. Attempts have been made to rectify the situation by mechanical reprofiling, which is likely to fail in the long run because it does not address the lack of new material, or by beach recharge. Thus, a key element of structure and function are the coastal processes that influence the movement and deposition of sediment. In many locations, especially in England, these are compromised by coastal engineering. This results in a potential reduction in the extent of shingle structures. Most UK gravel sediment deposits are finite relict deposits formed in the Holocene. Only a small proportion of additional shingle sediment enters the system from coastal erosion or rivers. **Natural mobility** - Shingle features are rarely stable in the long term. Many structures exhibit continuous longshore drift and ridges lying parallel to the shoreline tend to be rolled over towards the land by wave action in storm events. This movement has a knock-on effect on low-lying habitats behind the shingle. Movement is likely to be accelerated by climate change resulting in sea level rises and increased storminess. Structures and other intervention that interfere with this natural movement should be resisted. **Exploitation -** Shingle structures have been regarded as a convenient source of aggregates, and have been subject to varying degrees of extraction resulting in severe alteration of morphology and vegetation, or almost total destruction of majoir parts of the feature. Industrial plant, defence infrastructure and even housing has been built on shingle structures destroying vegetation and ridge morphology. **Access -** Shingle vegetation is fragile, the wear and tear caused by access on foot and particularly by vehicles, had damaged many sites. The causes include military use, vehicle access to beaches

	Bae Cemlyn/ Cemlyn Bay SAC
	by fishermen, and recreational use. Such disturbance can also affect breeding birds. **Grazing -** In a few cases areas of shingle were traditionally grazed, but this management has now largely ceased, leading to domination by willow carr on wetlands and changes to vegetation structure. The impacts of removal of grazing on breeding birds and other shingle species are not fully understood. Other pressures may include surface damage, water abstraction and fragmentation. Many sites experience several of these pressures at one time. All of these influence the degree of conservation of the habitat. **Air pollution** - Based on an assessment of relevant literature, this habitat is potentially sensitive to air pollution, but is has not been possible to undertake an assessment of potential impact based on critical loads because of the poor equivalence between this habitat and those for which critical loads are set.
Landowner/ Management Responsibility	• National Trust/CCW/North Wales Wildlife Trust/ Isle of Anglesey
HRA/AA Studies undertaken that address this site	HRA and AA of the Wales Spatial Plan Update (WSPU) National and Area Frameworks, Welsh Assembly Government (June 2008, C4S) The HRA screening process concluded that it was not possible to confirm that the WSPU, alone or in combination with other plans or projects, would not have a significant effect on European and International sites in Wales, its offshore waters and across the border in England. An Appropriate Assessment was therefore undertaken together with a further HRA carried out in greater detail in relation to the lower tier plans, action plans, and programmes which enable the delivery of the Welsh Spatial Plan. As a result of the proposed avoidance and mitigation action which was been identified, it was

	Bae Cemlyn/ Cemlyn Bay SAC
	concluded that the WSPU will not adversely affect the integrity of European and international sites, either alone or in combination with other plans or projects. The AA found that key actions associated with the WSPU and in-combination effects with other plans and projects that may affect European sites are: urban and economic development activities; water abstraction and water pollution; recreation and tourist pressures; provision of energy and transport infrastructure.

Site Name: Glannau Ynys Gybi/ Holy Island Coast

- **Location: 531806N/ 044118W**
- **JNCC Site Code UK0013046**
- **Size: 464.27 ha**
- **Designation: SAC**

	Glannau Ynys Gybi/ Holy Island Coast SAC
Site Description	Holy Island Coast, off the north-west coast of Anglesey, Wales, has hard rock acidic cliffs and supports important examples of coastal cliff heathland vegetation. In addition to maritime heath including western gorse and heather, other grassland communities and several rare species such as spotted rock-rose *Tuberaria guttata* and the endemic South Stack fleawort *Tephroseris integrifolia ssp maritima* have colonised extensive maritime cliff-crevices within the folded rocks and are able to withstand harsh conditions. The maritime influence is not as extreme as in north Scotland, and this site represents an important part of the range of variation on the mid-west coast of the UK. Holy Island Coast is also the most important site in north Wales for maritime forms of European dry heaths. The main NVC types are H7 *Calluna vulgaris – Scilla verna* heath and H8 *Calluna vulgaris – Ulex gallii* heath. The dry heathland is associated with small areas of wet heath and forms part of a complete zonation from maritime grassland through maritime heath to inland heath with Bracken *Pteridium aquilinum* to Bramble *Rubus fruticosus* scrub. This mosaic of habitats provides conditions suitable for the Chough *Pyrrhocorax pyrrhocorax* and Silver studded blue butterfly *Plebeius argus* that can be seen on or around these expanses of heathland. The cliffs also support important seabird colonies; Guillemots *Uria aalge*, Razorbills *Alca torda* and Puffins *Fratercula arctica* combine to create one of the largest colonies of breeding auks in North Wales. Fulmar *Fulmarus glacialis* and Kittiwake *Rissa tridactyla* also nest on these cliffs together with peregrine and chough, the latter using the heathland and adjacent areas extensively for feeding. Within the heathland Stonechat *Saxicola torguata*, Skylark *Alauda arvensis*, Linnet *Carduelis*

	Glannau Ynys Gybi/ Holy Island Coast SAC
	cannabina and Whitethroat *Sylvia communis* all breed regularly.
Qualifying Features	Annex I habitats that are a primary reason for selection of this site: 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: 4010 Northern Atlantic wet heaths with Cross-leaved heath *Erica tetralix*
Conservation Objectives	The interest features will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: **Interest Feature 1: Vegetated sea cliffs of the Atlantic and Baltic coasts (including cliff and crevice vegetation, maritime grassland and maritime heath)** • Cliff and crevice vegetation, maritime grassland and maritime heath occurs throughout the site in appropriate areas and their relative extent and zonation are determined by topography, exposure, grazing and natural stochastic events (for example, storms). • The cliff vegetation is composed of native plants such as Sea spurrey *Spergularia rupicola,* Sea lavenders *(Limonium britannicum, L procerum, L. binervosum)* and Sea samphire *Crithmum maritimum*. • Non-native plants, such as Hottentot fig *Carpobrotus edulis* or Purple dew-plant *Disphyma crassifolium* are preferably absent or at least not spreading from their 2000 extent. • Maritime Grassland occupies higher ledges on the coastal cliffs and the cliff-top.

	Glannau Ynys Gybi/ Holy Island Coast SAC
	• The following plants are common in the maritime grassland: Red fescue *Festuca rubra*, Thrift *Armeria maritime,* Spring squill *Scilla verna* and Sea plantain *Plantago maritime*. • Maritime Heathland occupies areas inland of the maritime grassland. • The following plants are common in the maritime heathland: Heather *Calluna vulgaris,* Bell heather *Erica cinerea,* Western gorse *Ulex gallii,* Thrift *Armeria maritima*, Sea plantain *Plantago maritima*, Buck's horn plantain *Plantago coronopus* or Spring squill. • Competitive species indicative of under-grazing, particularly Bracken *Pteridium aquilinum* and Gorse *Ulex europaeus* and grass species indicative of improvement including Creeping bent *Agrostis stolonifera,* Cock's foot *Dactylus glomerata,* Perennial rye-grass *Lolium perenne* and Yorkshire fog *Holcus lanatus* are largely absent from the heath. • Sustainable populations of the plants which make up the Atlantic sea cliff rare plant assemblage will be present, notably, South Stack fleawort *Tephroseris integrifolia*, Sea lavenders, Golden hair lichen *Teloschistes flavicans* and Ciliate strap lichen *Heterodermia leucomelos.* **Interest Feature 2: European dry heaths** • Dry heath covers no less than the present mapped extent (*to be determined*). • The following plants are common in the dry heath: Heather, Bell heather, Western gorse. • Competitive species indicative of under-grazing, particularly Bracken *Pteridium aquilinum*, Purple moor-grass *Molinia caerulea* and Western gorse are kept in check.

	Glannau Ynys Gybi/ Holy Island Coast SAC
	• 70% of dry heath will be “good condition” dry heath. • The dry heath provides abundant and accessible food for breeding Chough. • The dry heath supports sustainable (flowering) populations of Dodder *Cuscuta epithymum*. • Spotted rock-rose *Tuberaria guttata* occurs in at least 5 distinct loci (presently South Stack, Porth Dafarch north, Porth y Garan, Pany yr Hyman path, Pant yr Hyman heath) of at least 200 plants each. • Juniper *Juniperus communis* occurs in at least 3 locations totalling 50 plants. • The dry heath supports a viable population of Silver studded blue *Plebeius argus*. **Interest Feature 3. Northern Atlantic wet heaths with *Erica tetralix*** • Wet heath covers no less than the present mapped extent (*to be determined*). • The following plants are common in the wet heath: Heather, Cross-leaved heath, Bog moss *Sphagnum* spp., Devil’s bit scabious *Succisa pratensis* and Bog Asphodel *Narthecium ossifragum.* • Competitive species indicative of under-grazing, particularly Bracken, Purple moor-grass and Western gorse are kept in check. • 70% of wet heath will be “good condition” wet heath. • The wet heath supports sustainable (flowering) populations of Marsh gentian *Gentiana pneumonanthe*, Three-lobed water crowfoot *Ranunuculus tripartitus*, and Pillwort *Pilularia*

	Glannau Ynys Gybi/ Holy Island Coast SAC
	globulifera. • The wet heath supports a viable population of Bog bush cricket *Metrioptera brachyptera* and contributes potential support of a meta-population of Marsh fritillary. The performance indicators can be found within the Glannau Ynys Gybi SAC and SPA Core Management Plan.
Component SSSIs	• Glannau Ynys Gybi SSSI • Tre Wilmot SSSI Maps containing the component SSSIs can be viewed on the CCW website.
Key Environmental Conditions (factors that maintain site integrity)	**Grazing** – Light grazing should be maintained to remove excess herbage, encourage the maintenance and development of dwarf shrub heath and maritime grasslands and control the development of scrub. Grazing should be mainly concentrated between May and September, as heavy autumn grazing can destroy Heather. Grazing cattle help to maintain the dwarf shrub heathland within which the Marsh gentian grows. Cattle and/or horses are preferable to sheep, since they are less selective in their grazing habits and therefore allow plants to set seed. No sheep should be used during the flowering season from July through September, as nationally rare species such as the Spotted Rock Rose are susceptible to this. Cattle also help to break up clumps of Gorse by trampling and keep edges of pools open; the minor poaching and open paths created by cattle are amongst areas where Marsh gentian flowers most freely and other seedlings can establish. Poached areas on pool edges are favoured by Pillwort and the Three lobed water crowfoot, whilst localised bare patches from poaching maintains open conditions for the Silver studded blue. **Burning** - This site has traditionally been burnt as a management tool. Burning can rejuvenate

	Glannau Ynys Gybi/ Holy Island Coast SAC
	heathland and creates opportunities for germination of marsh gentians. However, over-frequent burning impoverishes the invertebrate fauna and encourages gorse and purple moor-grass. It should be used as a tool to encourage correct grazing, not as a primary tool to control the vegetation. No more than a tenth of the heathland area should be burnt annually, following the Grass and Moor Burning Regulations. Fire-breaks should be established. Care should be taken to avoid burning wet heath where mosses could be scorched and killed. To avoid bracken invasion following burning grazing must be maintained, particularly on deeper soils. Controlled burning reduces the risk of large accidental burns, which can devastate large areas of heathland and grassland. Burning on this site needs to be undertaken with extreme caution and accompanied by grazing. Burning can create early successional stages conducive to silver studded blue. **Low soil fertility** - No fertilisers of any kind should be applied. Low soil fertility helps heather and western gorse to compete against more aggressive agricultural grasses. The application of any fertiliser or slurry should be avoided and animals should not be fed with silage on the site. **Water quality** – The wet heath should be kept moist by precipitation and seepages, and should not be subject to run-off from agricultural activities such as fertiliser application. It could still be affected by airborne pollutants such as lime drift from adjoining farmland or nitrous oxides from hydrocarbon combustion. **Scrub control** - Small patches of scrub should be tolerated on site since they provide shelter and nest sites for a variety of insects, birds and other animals. If burning and grazing are unsuccessful in limiting scrub distribution it may be necessary to cut back European gorse, Birch and Willow to prevent it encroaching on the heathland areas. Scrub control should be done on a rotational small scale basis followed by grazing and should aim to restore the area of heathland, to control invasive European gorse and to stop wetter areas drying up. Cutting scrub and bruising bracken (or trampling with heavy stock in late spring) is preferable to using chemicals, although stump treatment with

	Glannau Ynys Gybi/ Holy Island Coast SAC
	chemicals may be the best method of ensuring the roots are killed. **Public access, anthropogenic activity and development** – Significant disturbance attributable to human activities can result in displacement from foraging, roosting and breeding sites of Chough and other bird species, leading to reduced food intake and/or increased energy expenditure. Management of recreational activities (walking, climbing, cycling access) is required to prevent erosion/ disturbance. Development such as car parks, slipways, ramps, sea defence structures etc have the capacity to destroy or cover geological features and can alter the extent of cliff and crevice vegetation, maritime grassland and maritime heath.
SAC Condition Assessment	**Conservation Status of Feature 1: Vegetated sea cliffs of the Atlantic and Baltic coasts**: **Unfavourable condition.** The maritime grassland and maritime heath are also considered to be in unfavourable condition due to the dense grass thatch over many areas and lack of bare patches due to absence of grazing animals. **Conservation Status and Management Requirements of Feature 2: European dry heaths: Unfavourable declining** due to the low / absent grazing pressure on the key dry heath areas on Tre Wilmot, Holyhead Mountain and Penrhosfeilw Common (The Range) and on Porth Dafarch E and W and Silver Bay, and in part to over-intensive fires on Holyhead Mountain. The result is increasing levels of western gorse *Ulex europeaus* in some areas, a dense, low diversity growth of heather and gorse, devoid of other heathland species in others, the development of a thatch of fescue grasses and a lack of early successional stages with plenty of open spaces to provide for feeding Chough, and Silver-studded blue for example. **Conservation Status and Management Requirements of Feature 3: Northern Atlantic wet heaths with *Erica tetralix:* Unfavourable declining** due to the low / absent grazing pressure on the key wet heath areas on Tre Wilmot. The result is increasing levels of scrub, the decline of marsh

	Glannau Ynys Gybi/ Holy Island Coast SAC
	gentian, pillwort and three-lobed water crowfoot. Condition status for component SSSIs currently unavailable.
Vulnerabilities (includes existing pressures and trends)	**Factors affecting Vegetated sea cliffs of the Atlantic and Baltic coasts:** **Erosion –** this is a highly significant factor in soft cliffs. High rates of erosion do not imply a loss of the cliff resource, either in geological or biological terms. Cliff face communities are able to retreat with the cliff line, and erosion is vital for constantly renewing geological exposures and recycling the botanical succession on soft cliffs. However, cliff-top vegetation may be destroyed where it is squeezed between a receding cliff face and cultivated land. Cliff erosion in many places provides an essential supply of sediment to coasts lying down-drift of the cliffs. **Coastal protection -** coastal protection systems have been built on many soft cliff coasts in order to slow or stop the rate of erosion and thus protect capital assets behind the cliff line. Cliff faces may also be re-profiled and sown with hardy grasses of little value for nature conservation. All such works have the effect of stabilising the cliff face, resulting in geological exposures being obscured, bare soil and early pioneer stages being progressively overgrown, and wet flushes drying out. Soft cliffs require a certain amount of natural erosion to maintain their interest, but unprotected soft cliff is now a relatively scarce habitat. **Built development** - there have been many instances in the UK of urban or industrial development and holiday accommodation being built too close to cliff-tops. Where the cliffs are subsequently discovered to be eroding, there is often political pressure to build the type of defensive works described above. Built development also prevents cliff-top biological communities from retreating in response to cliff erosion, subjecting them to a form of 'coastal squeeze'.

	Glannau Ynys Gybi/ Holy Island Coast SAC
	Agriculture - in traditional low-intensity grazing systems, livestock were grazed on cliff grasslands where they maintained open maritime grassland vegetation. Post-war intensification of agriculture has led maritime grassland on more level terrain being ploughed out, while that on sloping ground has been abandoned and, where not maintained by exposure, is frequently overgrown by scrub. Localised eutrophication can be caused by fertiliser run-off from arable land above and this encourages coarse, vigorous 'weed' species at the expense of the maritime species. Agricultural land drains discharging on the cliff face may cause local acceleration of erosion. **Recreational use** - pressure for recreational development remains a threat and visitor pressure requires constant management to counter soil erosion and disturbance to wildlife. The siting of holiday accommodation on cliff-tops not only reduces the landscape value of a site, but can also cause heavy localised erosion and disturbance to nesting birds. An increase in the number of walkers and dogs along some coastal footpaths has increased livestock worrying and even losses and forced a number of farmers to remove their stock from these sites. Consequently, some of the sites are now suffering from a lack of appropriate grazing, and scrub encroachment is likely to become a problem. **Introduced species -** predators, such as cats and rats, can have a significant impact on populations of cliff or burrow nesting seabirds, particularly on island sites. Also the spread of certain alien, invasive plants from nearby colonies, especially members of the flowering plant family *Aizoaceae* such as the Hottentot fig, can have a devastating impact on indigenous maritime plant communities. This is being carefully monitored. **Grazing** - lack of grazing or use of inappropriate stock leading to encroachment of scrub/bracken onto maritime grassland is a factor. Overgrazing may be a problem in some places (including that by rabbits), leading to reduction in habitat diversity. Vegetation succession on areas remote from the cliff top requires regular intervention by grazing, cutting or burning to mimic traditional management. Much of the area is managed by RSPB in accordance with a Management plan or by private

	Glannau Ynys Gybi/ Holy Island Coast SAC
	landowners under CCW management agreement or Environmental Stewardship agreements. **Air pollution** - this habitat is potentially sensitive to air pollution. **Factors affecting European Dry Heaths and Northern Atlantic Wet Heaths with *Erica tetralix*:** **Over-grazing -** over-grazing is a particular issue for the upland component of this habitat. However wet heath tends to be less attractive to grazing animals than dry heath and this may have led to relatively smaller losses due to overgrazing. **Under-grazing** - lack of grazing is a particular issue in lowlands. **Invasive species -** the impacts of heather beetle (particularly on the upland component of this habitat) appear to be increasing and may become a bigger problem (possibly linked to climate or atmospheric deposition). **Development pressures** – both direct loss to development and secondary effects such as increased recreation, fragmentation and isolation and associated pressures from development close to the habitat are a particular issue for the lowland component of this habitat. Renewable energy and other developments such as wind-farms and telecommunications masts are an increasing pressure on this habitat in the uplands. There is a mineral extraction permit on land held by the local authority which is not currently exercised, and pressure for further telecommunications development. **Burning -** burning is traditionally used for game and agricultural management of moorland but inappropriate burning regimes can lead to damage to particular elements of the core habitat. Inappropriate burning management combined with inappropriate grazing can lead to loss of dwarf-shrubs from wet heath. There is evidence in the Scottish Highlands that intense burning may have converted blanket bog plant communities to wet heath.

	Glannau Ynys Gybi/ Holy Island Coast SAC
	Air pollution - air pollution is considered to be a potentially significant pressure to the structure and function of this habitat. **Water management** –Lack of water due to drainage is a particular issue for wet heath habitats.
Landowner/ Management Responsibility	Isle of Anglesey/Countryside Council for Wales
HRA/AA Studies undertaken that address this site	**HRA and AA of the Wales Spatial Plan Update (WSPU) National and Area Frameworks,** Welsh Assembly Government (June 2008, C4S). The HRA screening process concluded that it was not possible to confirm that the WSPU alone or in combination with other plans or projects, would not have a significant effect on European and international sites in Wales, its offshore waters and across the border in England. An Appropriate Assessment was therefore undertaken together with a further HRA carried out in greater detail in relation to the lower tier plans, action plans, and programmes which enable the delivery of the Welsh Spatial Plan. As a result of the proposed avoidance and mitigation action which was been identified, it was concluded that the WSPU will not adversely affect the integrity of European and international sites, either alone or in combination with other plans or projects. The AA found that key actions associated with the WSPU and in-combination effects with other plans and projects that may affect European sites are: urban and economic development activities; water abstraction and water pollution; recreation and tourist pressures; provision of energy and transport infrastructure.

Site Name: Corsydd Môn / Anglesey Fens

- **Location: 531845N/041744W**
- **JNCC Site Code UK0012884**
- **Size: 467.19 ha**
- **Designation: SAC**

	Corsydd Môn / Anglesey Fens SAC
Site Description	Anglesey Fens complex supports the second-largest area of calcareous fens in the UK. The seven fens (Cors Erddreiniog, Cors Goch, Cors Bodeilio, Cors y Farl, Waen Eurad, Gwenfro-Rhos y Gad, and part of Caeau Tawrn) that make up this SAC complex are associated with limestone. The fens, fed by lime-rich water, support a wide range of plants including Black bog-rush *Schoenus nigricans*, Great fen sedge *Cladium mariscus*, Blunt flowered rush *Juncus subnodulosus* and Fen pondweed *Potamogeton coloratus*, as well as more colourful flowers such as the Water lily, Fly orchid *Ophrys insectifera* and Narrow leaved orchid *Dactylorhiza traunsteineri*. Anthropogenic disturbance is believed to have been instrumental in the development of *Cladium – Molinia* communities, a particular feature of the rich fens of north-west Wales. This composite site includes four component fen systems supporting a diverse range of short-sedge mires, including the best and most extensive Welsh examples of NVC type M13 *Schoenus nigricans – Juncus subnodulosus* mire and a range of communities referable to M9a *Carex rostrata – Calliergon cuspidatum/ giganteum* mire. These are considered to be of pre-eminent importance in the UK, owing to their extent, biogeographical significance and exceptionally rich assemblage of rich-fen species. The fens are strongly influenced by the underlying Carboniferous limestone and are fed by calcareous groundwater arising from discrete springs and more diffuse zones of seepage. The alkaline fen communities often occur within complex vegetation zonations, with gradations to unimproved calcicolous and neutral grasslands also present. The characteristic mixture of southern and northern floristic elements includes a wide range of nationally or locally scarce species, including

	Corsydd Môn / Anglesey Fens SAC
	Fly orchid, Narrow-leaved marsh orchid, Marsh helleborine *Epipactis palustris*, Lesser clubmoss, *Selaginella selaginoides* and slender sedge *Carex lasiocarpa*. Examples of M13 mire within Anglesey Fens which are strongly influenced by the discharge of calcareous groundwater provide the sole north Wales locus for the Annex II species Southern damselfly *Coenagrion mercuriale*. Within Cors Erddreiniog lies Llyn yr Wyth Eidion, a small marl (lime deposit) producing lake, an example of a lake on limestone. It is surrounded by the extensive calcareous valley mire of Cors Erddreiniog, which overlies limestone and protects the lake against nutrient enrichment, resulting in water of high quality. Hedgehog stonewort *Chara pedunculata* and the rare Rugged stonewort *C. rudis* have been recorded at this site. At Cors Erddreiniog and Waun Eurad populations of the Geyer's whorl snail *Vertigo geyeri* are found. The site contains one of the largest known populations of Geyer's whorl snail in calcareous fen at low altitude. This tiny snail is a rare animal of the northern and alpine areas of Europe, and is confined to wetland areas supplied by calcium-rich water, making the Anglesey fens an ideal place. Drier areas of heathland and grassland associated with the fens are dominated by Heather and Cross leaved heath, but with brilliant splashes of colour provided by Bog asphodel, Western gorse, Marsh gentian, Pale heath violet, Green winged orchid *O. morio* and Lesser butterfly orchid *Platanthera bifolia*. Among other rare animals found on this complex of wetland and heathland is the Marsh fritillary butterfly. The Southern damselfly occurs here at its most northerly British location. The Southern damselfly is now considered to be threatened across its global range of South-West Europe and North Africa.
Qualifying Features	Annex I habitats that are a primary reason for selection of this site: Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.

	Corsydd Môn / Anglesey Fens SAC
	Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* Alkaline fens Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: Northern Atlantic wet heaths with *Erica tetralix* *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) Annex II species that are a primary reason for selection of this site: Geyer`s whorl snail *Vertigo geyeri* Annex II species present as a qualifying feature, but not a primary reason for site selection: Southern damselfly *Coenagrion mercuriale* Marsh fritillary butterfly *Euphydryas* (*Eurodryas*, *Hypodryas*) *aurinia*
Conservation Objectives	The interest features will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: **Interest Feature 1: Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.** • Open water occupies not less than 1% of the total site area. • Natural deep lakes persist at Cors Goch and Cors Erddreiniog component sites. • The macrophyte, phytoplankton, zooplankton and predator components of the ecosystem operate in balance in a clear-water environment, where: Characteristic macrophyte species are present in the water bodies, including dense beds of stoneworts (*Chara* spp), in areas <6m deep. • Invasive non-native species are absent, or occur at no more than rare or occasional frequency. • Locally native (non-coarse) fish are present. • All coarse fish are absent. • Water quality is such as to maintain pH 7-9 and mean annual Total Phosphorus <15µg/l.

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	• The water is clear throughout the year, with an absence of algal blooms. • Marl deposition occurs within all the lakes. • There is minimal extraneous sediment input. • The integrity of the natural hydrological system (inputs and outputs) is intact. • Appropriate water level is maintained throughout the year (seasonal fluctuation 30cm). **Interest Feature 2: Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*** • Calcareous fen occupies at least 20% (93ha) of the total site area. • Calcareous fen is over at least 5 of the 7 sites including Cors Erddreiniog, Cors Bodeilio, Cors Goch, Gwenfro-Rhos Y Gad and Cors Y Farl. • Calcareous fen exhibits a range of condition states (see below) in which Great fen sedge *Cladium* is frequent to dominant, with no less than 10% referable to species-poor *Cladium* swamp and the remainder to either vegetation in which *Cladium* occurs with Sweet gale *Myrica gale*, Bluntflowered rush *Juncus subnodulosus*, Purple moor-grass *Molinia caerulea* and Cross-leaved heath *Erica tetralix*, or vegetation with many of the above elements as well as Bog-bean *Menyanthes trifoliata* *M*arsh cinquefoil *Potentilla palustris,* Bladderwort *Utricularia vulgaris*, and Slender sedge *Carex lasiocarpa* and other small sedges. • Species indicative of drainage or agricultural modification, such as Yorkshire fog *Holcus lanatus*, Bramble *Rubus spp*., and Nettle *Urtica dioica* are largely absent from the calcareous fen. • Purple moor-grass does not exceed 25% of ground cover. • Leaf litter forms no more than 20% of the ground cover at any location. • Scrub species such as Willow *Salix* and Birch *Betula* are largely absent from the calcareous fen. • *Rhododendron spp*. is absent. • Standing surface water is present or expressable on footfall over most of the winter period. • Groundwater is within 15cm of surface in mid summer. • All hydrological (diffuse, surface and sub-surface) pathways (inputs and outputs) are restored

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	and/or intact (includes ditch infilling, blocking, diversion and re-engineering). Water quality reflects the base-rich but nutrient-poor requirements of the habitat. **Interest Feature 3: Alkaline fen** • Alkaline fen occupies at least 17% of the total site area. • Alkaline fen is found on all 7 component sites. • The following plants are common in the alkaline fen: Black bog rush *Schoenus nigricans*, Moss *Campyllium stellatum*, Great fen sedge (up to 1m tall), Blunt flowered rush *Juncus subnodulosus*, Sweet gale *Myrica gale*, Moss *Drepanocladus revolvens,* Bladderwort *Utricularia sp.* and Butterwort *Pinguicula vulgaris*. • Species indicative of drainage or agricultural modification, such as Yorkshire fog, Bramble and Nettle are largely absent from the alkaline fen. Purple moor-grass does not exceed 25% of ground cover and is restricted to drier areas. • Bare ground including tufa constitutes about 10% of the ground cover. • Alkaline Fen exhibits a diverse age and height structure across the site (tussocks are undamaged and 20% short grazed, 50% mature – 30% in between incl bare ground). • Scrub species such as Willow and Birch are largely absent from the alkaline fen. • *Rhododendron spp*. is absent. • Water expressable on foot-fall or running surface water is present between tussocks throughout the year. • All hydrological (diffuse, surface and sub-surface) pathways (inputs and outputs) should be restored and/or intact (includes ditch infilling, blocking, diversion and re-engineering). • Water quality is appropriate to the needs of the vegetation and species. **Interest Feature 4: Northern Atlantic wet heaths with *Erica tetralix*** 33

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	• Wet heath covers at least 4%ha of the site. • The following plants are common in the wet heath: Heather, Cross-leaved heath as well as Bog moss *Sphagnum* spp., Devil's bit scabious *Succisa pratensis* and *Narthecium ossifragum.* • Competitive species indicative of under-grazing, particularly Bracken, Purple moor-grass and Western gorse will be kept in check. • 70% of wet heath will be "good condition" wet heath. • The wet heath supports viable populations of Marsh gentian at Cors Erddreiniog. • The wet heath contributes to the support of a viable meta-population of Marsh fritillary. **Interest Feature 5: *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils** • Molinia meadows occupy at least 2% of the total site area. • Molinia meadows are distributed over at all 7 component sites. • The following plants are common in the Molinia meadows: Purple moor-grass, Devil's bit scabious, Carnation sedge *Carex panacea, S*aw wort *Serratula tinctoria,* Lousewort *Pedicularis sylvestris*, *Carex pulicaris* and *C. hostiana and* Marsh orchids *Dactylorhiza* sp.. • Soft rush *Juncus effusus* and species indicative of agricultural modification, such as Perennial rye grass *Lolium perenne* and White clover *Trifolium repens* are largely absent from the *Molinia* Meadows. • Purple moor-grass does not exceed 50% of ground cover. • Scrub species such as Willow and Birch are largely absent from the Molinia meadows. • *Rhododendron spp.* are absent. • Leaf litter should comprise <25% of ground cover. • Groundwater will be between –10cm and –25cm below ground level for most of the year. • The integrity of the hydrological system (inputs and outputs) will be intact. • Swards structure should reflect the requirements of Marsh fritillary. **Interest Feature 6: Geyer`s whorl snail**

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	• There are abundant areas of flushed fen grassland (M13 / feature 2) with sedge/moss lawns 5-15cm tall, containing species such as *Carex viridula* subsp. *brachyrrhyncha*, *Pinguicula vulgaris, Briza media, Equisetum palustre, Juncus articulatus* and the mosses *Drepanocladus revolvens, Campylium stellatum,*with scattered tussocks of *Schoenus nigricans* no greater than 80cm tall. • Soils are saturated schoenus tussocks lower than 80cm. **Interest Feature 7: <u>Southern damselfly</u>** • Population size is stable or increasing. • The population occupies at least 3 distinct management units. • The total area of good breeding habitat does not fall below 1000m^2. • Seepages and shallow runnels at Nant Isaf will be clear, pollution free and will support good numbers of native aquatic plants. • The population of southern damselflies on the site (allowing for normal annual fluctuations) is maintained or increases. • Species indicative of drainage or agricultural modification, such as Yorkshire fog, Bramble and Nettle are largely absent. • Alkaline Fen habitat exhibits a diverse age and height structure across the site (tussocks are undamaged and 20% short grazed, 50% mature – 30% in between incl bare ground. • Scrub species such as Willow and Birch are largely absent from the alkaline fen habitat. • *Rhododendron spp.* is absent from the feature. • Appropriate grazing is managed across 100% of the site. • Standing or running surface water is present between tussocks throughout the year, and visible over 30% of the tussock covered area. • All hydrological (diffuse, surface and sub-surface) pathways (inputs and outputs) should be restored and/or intact (includes ditch infilling, blocking, diversion and re-engineering). • Water quality is appropriate to the needs of the vegetation and species.

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	Interest Feature 8: Marsh fritillary butterfly • The site supports a sustainable meta population of the Marsh fritillary. • The population is viable in the long term, (acknowledging the extreme population fluctuations of the species). • Habitats on the site are in optimal condition to support the metapopulation. • At least 6% (approximately 30ha) of the total site area is marshy grassland or wet heath suitable for supporting Marsh fritillary, with Devil's-bit scabious *Succisa pratensis* present and only a low cover of scrub. • At least 40% of this 30ha is good Marsh fritillary breeding habitat, dominated by purple moor-grass with *S. pratensis* abundant throughout and a vegetation height of 10-20cm over the winter period. • Areas of good Marsh fritillary habitat are scattered over several management units. • Off site habitats that function as stepping stone or corridors located between SAC compartments will be maintained for migration, dispersal, foraging and genetic exchange purposes.
Component SSSIs	• Cors Erddreiniog SSSI • Cors Goch SSSI • Cors Bodeilio SSSI • Cors y Farl SSSI • Gwenfro Rhos y Gad SSSI • Waun Eurad SSSI • Caeau talwrn SSSI Maps containing the component SSSIs can be viewed on the CCW website
Key Environmental Conditions (factors that	**Drainage** - Past attempts at drainage and the maintenance of lowered water levels in parts of the site continue to damage examples of both SAC fen features. Water Level Management Plans are in

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maintain site integrity)	preparation by the Environment Agency supported and advised by CCW. **Water abstraction –** Abstraction levels need to be managed to prevent loss of area through drainage and conversion to intensive agriculture impact upon alkaline fens. Excessive water abstraction can dry up aquifers and reduce spring line flows, leading to lowered water tables. Abstractions can also affect the natural balance between the differing water qualities of ground water and surface water. **Water management and quality** - The management of surface and groundwater is crucial to providing the surface groundwater requirements of each type of fen, as are its constituents, for example basic ions such as calcium, its pH, and quantity of the plant nutrients nitrogen and phosphorus. Water quality and quantity within the lakes are crucial factors determining their survival. Water levels in main and subsidiary ditches should be maintained and kept free of rubbish, and careful ditch management is critical to the survival of the southern damselfly as they require shallow breeding streams. Sheep dip disposal in the immediate vicinity needs to be well planned to avoid endangering damselfly species. **Grazing** – The abandonment of traditional grazing and reed and peat-cutting practices in some areas is leading to undesirable successional changes in vegetation composition and structure, leading to population declines of the Southern damselfly and Geyer's whorl snail. Management agreements or direct management by conservation agencies (namely CCW and North Wales Wildlife Trust) are seeking to reinstate grazing with cattle or ponies, scrub and reed cutting and in some instances possibly peat-cutting, to slow down or in places reverse successional change. Agri-environment schemes employed should ensure that grazing occurs at the correct intensities on the Fens, whilst sustainable, long-term grazing over the site as a whole needs to be facilitated. Management is required to ensure over-grazing is avoided in upland habitats, although wet heath tends to be less attractive to grazing animals than dry heath. Sensitive cutting should be undertaken in some of the outer, drier fens to increase the diversity of habitats and encourage grazing here.

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	Burning - Burning regimes, traditionally a management tool for management of moorland should be reintroduced appropriately to rejuvenate heathland and create opportunities for germination. Care should be taken to avoid burning wet heath where mosses could be scorched and killed. Central sections of fen also require planned, controlled burning as part of their management, with adequate firebreaks provided. **Nutrient enrichment** – This is a major factor affecting the lakes within the SAC, with pollution of water supplies, especially by agricultural run-off of nitrate and phosphate, threatening the site with eutrophication which can lead to substantial adverse changes to key plant communities. Significant progress has been made in reducing significant point sources through investment in phosphorus stripping at major waste water treatment works. Diffuse sources are more difficult to manage and this habitat type may be particularly susceptible to diffuse nutrient pollution due to the high porosity of sandy substrates. Valley fens are particularly susceptible to agricultural run-off within the catchment. Adjacent land surrounding the site should be entered into Agri/Catchment scheme to reduce nutrient/sediment inputs. There are some areas where years of nutrient input can only be reversed by re-profiling and peat removal, followed up by the introduction of a constructed wetland to absorb nitrates. Other areas where Fen has been constrained will require localized peat cutting. **Air pollution** - Airborne nitrogen inputs are an insidious but long-term threat. Nitrogen deposition is of particular concern for oligotrophic water bodies, especially where there are elevated phosphate levels. Hydrophyte species richness is negatively related to winter nitrate concentration in European shallow lakes. Acid deposition is thought to be a minimal risk for *Chara* lakes, which are generally very well buffered. The NNR sections of the site are subject to management plans, including measures to enable public access and understanding.
SAC Condition Assessment	**Conservation Status and Management Requirements of Feature 1: Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.**

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	Unfavourable declining. Studies of Llyn Coron (Cors Goch) show this to have suffered a significant change from low productivity oligotrophic status to one typical of high nutrient concentrations, based on diatom analysis. Studies of Llyn yr Wyth Eidion show high winter NO^3 and total N, and again suggest a shift from the former oligotrophic status towards a eutrophic environment. Visual inspections suggest that on the whole the smaller water bodies are in better condition than the two lakes. **Conservation Status and Management Requirements of Feature 2: Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*** **Unfavourable declining**. Large areas of calcareous fen at Cors Erddreiniog in particular have been subject to drainage resulting in the removal of surface standing water and the development of *Molinia caerulea* dominated stands. Drainage of peripheral areas and nutrient inputs continue to affect the feature. Enrichment from both diffuse and point sources is an issue for all features. Further nutrient inputs emanate from atmospheric nitrogen deposition eg nitrogen deposition (NOx and NHx combined). Many sites have still not recovered from attempts at agricultural improvement of fen soils – these exhibit areas of very heavily modified marshy grassland and rush pasture on fen peat. Successional change has also led to the loss of alkaline and calcareous fen or significant deterioration in their condition. **Conservation Status and Management Requirements of Feature 3: Alkaline fen** **Unfavourable declining**. Attributes relevant to this assessment included excess *Molinia caerulea* litter and lack of brown moss components in many samples, the former probably due to undergrazing and the latter to associated shade or surface standing water (Creer, 2005). In addition to hydrological, nutrient and diversity issues this contributes to the declining nature of this feature. **Conservation Status and Management Requirements of Feature 4: Northern Atlantic wet heaths with *Erica tetralix*** **Unfavourable unclassified**. Monitoring of the Atlantic wet heath feature on Cors Goch and Cors

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	Erddreiniog has revealed an excess of *Molinia caerulea* litter and reduced cover of ericoid shrubs associated with inadequate burning and grazing management. **Conservation Status and Management Requirements of Feature 5: *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils** **Unfavourable declining,** due to dereliction, undergrazing and invasive species. **Conservation Status and Management Requirements of Feature 6: Geyer`s whorl snail** **Unfavourable declining.** The populations of Geyer's whorl snail are assessed to be unfavourable and declining due to dereliction and under-grazing of the habitat. This is particularly the case at Cors Erddreiniog where much of the habitat is outwith the ownership of conservation bodies. At Waun Eurad a CCW management agreement seeks to maintain appropriate grazing via common land grazing. Populations of Geyer's whorl snail are known to be vulnerable to the loss of open small-sedge communities and thus require focussed attention to ensure that suitable areas of fen are retained or encouraged to expand. **Conservation Status and Management Requirements of Feature 7: Southern damselfly** **Unfavourable declining.** Population surveillance has occurred for a number of years and confirms that dereliction, hydrology, water quality and undergrazing are reducing habitats and populations. **Conservation Status and Management Requirements of Feature 8: Marsh fritillary butterfly** **Unfavourable declining**. Surveillance and monitoring of this species records a decline in suitable and good habitat within the SAC and for potential metapopulation sites within the catchment. Fragmentation of habitat, both within and outside the SAC, dereliction of sites, grazing issues (undergrazing and overgrazing) affect the suitability of habitat for this feature. Intensive agricultural land management has fragmented the fen sites and resulted in the loss of connecting corridors critical for species movement and genetic exchange. Fragmentation threatens the viability of individual sites through impacts on population genetics, increased vulnerability to chance events,

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	and the creation of unsustainably small or impacted wetland units. Fragmentation reduces the viability of surviving wetland units by increasing their vulnerability to marginal impacts and drainage. Marginal habitat loss and the elimination of critical ecotones between fen and other habitats have a wider biodiversity impact, whilst also removing protective buffer zones. Nutrient enrichment represents a further critical ongoing and cumulative effect. Inappropriate land management also has a direct impact on areas of fen within agricultural holdings and adjacent to the main conservation sites. Condition status for component SSSIs currently unavailable.
Vulnerabilities (includes existing pressures and trends)	**Main pressures and threats for Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.** **Pollution** - Nutient enrichment is the major factor affecting lakes in the UK with many lakes in lowland UK having suffered considerable enrichment. The main driver of this eutrophication is phosphorus although there is increasing evidence that (in some lakes at least) nitrogen may also play a significant role. This phosphorus has both point source and diffuse source origins. Significant progress has been made in reducing significant point sources through investment in phosphorus stripping at major waste water treatment works. Diffuse sources are more difficult to manage and this habitat type may be particularly susceptible to diffuse nutrient pollution due to the high porosity of sandy substrates. Recovery of sites impacted by elevated nutrient loads is generally slow due to the limited flushing potential of many smaller lakes and internal loading issues. **Air pollution** - The UK Air Pollution Information System (APIS) identifies the major impacts of air pollutants on grasslands in the UK as resulting from nutrients (especially nitrogen deposition), acid deposition, heavy metals, particulate matter (PM_{10}) and radioactive particles. Nitrogen deposition is

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	of particular concern for oligotrophic water bodies, especially where there are elevated phosphate levels. Hydrophyte species richness is negatively related to winter nitrate concentration in European shallow lakes. Acid deposition is thought to be a minimal risk for *Chara* lakes, which are generally very well buffered. **Sea level rise** - Sea level rise leads to increased salinity of lake, modifying its chemistry and species composition. Overtopping (i.e. during winter storms) and groundwater penetration of seawater as well as deposition of sea spray are enough – though the latter is not sufficient on its own – to alter *Chara* lakes, especially as the sea gets closer to the water bodies with sea level rise. Once the salinity reaches a certain level the lake would become a brackish lagoon and when plants such as seaweeds start to establish, the habitat can probably be regarded as lost. **Main pressures and threats for Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*** Main pressures and threats include water abstraction, grazing, fragmentation, absence of or inappropriate management, pollution (this habitat not considered to be at threat from air pollution), and climate change. Climate change is considered a major threat to the future condition of this habitat especially in the long term. The scale of change in habitats and species as a result of climate change will vary across ecosystems. Small changes in the climate are more likely to have a substantial impact on habitats and species which exist within a narrow range of environmental conditions. The future impacts of climate change on UK biodiversity will be exacerbated when coupled with other drivers of environmental change. **Main pressures and threats for Alkaline fens** **Water abstraction -** Past and continuing loss of area by drainage and conversion to intensive agriculture. Excessive water abstraction from aquifers has dried up or reduced spring line flows, and generally lowered water tables. Abstractions also have affected the natural balance between the

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	differing water qualities of ground water and surface water. **Grazing** - Both under and over-grazing have been recorded as reasons for adverse condition. **Burning -** Although used as a management tool particularly but not exclusively in the uplands, burning can also damage the regeneration potential at certain sites. **Fragmentation -** Small total area of habitat and critically small population sizes of several key species dependent on the habitat. **Absence of or inappropriate management** - Lack of or inappropriate management of existing fens leading to drying, scrub encroachment and succession to woodland. **Pollution** - Valley fens are particularly susceptible to agricultural run-off within the catchment. Enrichment or hypertrophication can result in substantial adverse changes to key plant communities. **Air pollution** - this habitat is not considered sensitive to air pollution and is unlikely to be at risk. **Main pressures and threats for Northern Atlantic wet heaths with *Erica tetralix*** **Grazing** - Over-grazing is a particular issue for the upland component of this habitat. However wet heath tends to be less attractive to grazing animals than dry heath and this may have led to relatively smaller losses due to overgrazing. Lack of grazing is a particular issue. **Invasive species** - The impacts of heather beetle (particularly on the upland component of this habitat) appear to be increasing and may become a bigger problem (possibly linked to climate or atmospheric deposition). **Development pressures** – both direct loss to development and secondary effects such as

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	fragmentation and isolation, increased recreation and associated pressures from development close to the habitat – are a particular issue for the lowland component of this habitat. Renewable energy and communication mast developments are a pressure on this habitat in the uplands. **Burning -** Burning is a traditional management tool for management of moorland but can lead to damage to particular elements of the core habitat. Inappropriate burning management combined with inappropriate grazing can lead to loss of dwarf-shrubs from wet heath. There is evidence in the Scottish Highlands that intense burning may have converted blanket bog plant communities to wet heath. **Water management** - Lack of water due to drainage is a particular issue. **Air pollution** – air pollution is considered to be a potentially significant pressure to the structure and function of this habitat. **Main pressures and threats for *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils** **Grazing** – Under-grazing in wet grasslands in the UK have been traditionally managed as rough grazing, particularly by cattle, and to a much lesser extent by cutting to maintain favourable structure and function. A major current problem is agricultural neglect leading to litter build-up and scrub invasion. Underlying causes of under-grazing are still thought to be largely due to current agricultural economics and policies, exacerbated by, for example, BSE and Foot and Mouth disease, leading to a reluctance to keep stock (large stock in particular) on pasture perceived to have little nutritional value. Less prevalent than under-grazing, overgrazing by sheep is still sometimes reported, along with occasional poaching and trampling by livestock during wet periods. **Lack of remedial management** - It is natural for open fens to change spontaneously into wooded

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	fens, and management, such as scrub clearance and grazing, is required to prevent this. **Water management and quality** - The management of surface and groundwater is clearly crucial to providing the surface groundwater requirements of each type of fen, as are its constituents, for example basic ions such as calcium, its pH, and quantity of the plant nutrients nitrogen and phosphorus. **Agricultural improvement** - This includes drainage, cultivation and fertiliser applications. **Air pollution** - Air pollution is considered to be a potentially significant pressure to the structure and function of this habitat. Also reported, but probably less widespread, are the following threats: invasive species, too frequent burning, agricultural abandonment, leading to rankness and scrub encroachment through lack of grazing, fragmentation and disturbance from developments such as housing and road constructions, and afforestation. **Main pressures and threats for the Geyer`s whorl snail** Drainage (changes in hydrology), grazing (alterations to grazing regimes), modification of cultivation practices (over-shading through lack of management). **Main pressures and threats for the Southern damselfly** Inappropriate heathland management (i.e. reduced grazing and over-deepening of shallow breeding streams), agricultural drainage and water pollution, and dredging of breeding sites have been attributed to population declines. **Main pressures and threats for the Marsh fritillary butterfly**

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	Cultivation, mowing and cutting, use of pesticides and fertilisers, grazing pressures and changes in agricultural management, planting and scrub encroachment, burning and soil pollution/nutrient enrichment, drainage, development and recreation.
Landowner/ Management Responsibility	• Isle of Anglesey/CCW
HRA/AA Studies undertaken that address this site	N/A

Site Name: Llyn Dinam

- **Location: 53 15 59 N /04 32 03 W**
- **JNCC Site Code: UK0030186**
- **Size: 36.69 ha**
- **Designation: SAC**

	Llyn Dinam SAC
Site Description	Llyn Dinam is a coastal eutrophic lake in North Wales. Important features of this site include standing water habitast and aquatic plants found therein, reedswamp, marsh fern and breeding and overwintering wetland birds and waterfowl. Common reed *Phragmites australis*, and to a lesser extent Common club-rush *Scirpus lacustris* ssp. *lacustris*, dominate the shoreline. Rigid hornwort *Ceratophyllum demersum* is abundant in shallow open water, often in association with Autumnal starwort *Callitriche hermaphroditica* and Ivy-leaved duckweed *Lemna trisulca*. The white and yellow water-lilies *Nymphaea alba* and *Nuphar lutea* dominate in a sheltered arm on the west side. Fennel-leaved pondweed *Potamogeton pectinatus*, Perfoliate pondweed *P. perfoliatus* and Lesser pondweed *P. pusillus* have been recorded. Stoneworts *Chara* spp. are present. Water chemistry characteristics are consistent with those expected in eutrophic lakes, including relatively high pH, alkalinity and phosphorus levels. Llyn Dinam is the least-enriched of a series of Anglesey Lakes which have been subjected to sediment diatom analysis.
Qualifying Features	Annex I habitats that are a primary reason for selection of this site: **Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation**
Conservation Objectives	The interest features will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: **Interest Feature 1: Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type**

	Llyn Dinam SAC
	vegetation • There is no loss of area other than that due to natural processes (succession). • The aquatic plant community is typical of this lake type in terms of composition and structure. • Plants indicating very high nutrient levels and/or excessive silt loads are not dominant. • Invasive non-native water plants do not threaten to out-compete the native flora. • Invasive non-native fauna do not threaten the native flora and/or fauna. • Bird species listed as SSSI features continue to be present at m1% of UK populations • The nutrient, pH and dissolved oxygen levels are typical for a lake of this type and there is no excessive growth of cyanobacteria or green algae. • Chlorophyll • values are low, and sufficient to allow Llyn Dinam and Llyn Penrhyn to be passed as 'Good' or better for an 'high alkalinity shallow lake' using Water Framework Directive classification methods http://www.wfduk.org/management_info/News/UKCLASSPUB/. • The fringing swamp and mire vegetation is maintained. • The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
Component SSSIs	• Llynnau y fail SSSI Maps containing the component SSSIs can be viewed on the CCW website
Key Environmental Conditions (factors that maintain site integrity)	The site should continue to support a clear-water aquatic plant community characterised by a wide variety of pondweeds, while the lakes persist. Reedswamp and fen should support, amongst other things, marsh fern, while providing suitable habitat for breeding and wintering wildfowl and other wetland birds. The mixture of lakes, ponds, ditches and other water habitats; together with the reedbeds, marshland, scrub and wet grassland, should display the process of natural succession from open water to marshy grassland.

	Llyn Dinam SAC
SAC Condition Assessment	**Conservation Status and Management Requirements of Feature 1: Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation** **Unfavourable unclassified**. Llyn Dinam is unfavourable largely because broadleaved *Potamogeton* species are absent and because the Mean Annual Total Phosphorous level exceeds the limit for this type of lake at 58 µg/l based on data from 2003 –2005. (Ref Site Condition Assessments of Welsh SAC and SSSI standing water features, Burgess, Goldsmith and Hatton-Ellis 2006). However, it was concluded that the nutrient status of Llyn Dinam was moving towards favourable condition, although continued action to reduce catchment inputs will be needed to maintain this trend. Condition status for the component SSSI currently unavailable.
Vulnerabilities (includes existing pressures and trends)	**Water levels** – Charophyte-dominated lakes are largely restricted to situations where the catchment or aquifer from which they are supplied with water remains relatively unaffected by intensive land-use or other sources of nutrients. Abstraction and/or any lowering of levels of discharge streams or structures in them will therefore negatively impact upon the SAC. Inflow streams and outflows should not be subject to any modification without assessment of likely effects. **Water quality** - Currently poor water quality and oxygen content may be limiting natural recruitment of fish populations within the lakes. However any increase in fish populations may lead to a decline in zooplankton and an increase in algal blooms. **Nutrient inputs** – Nutrient levels are a major factor affecting this SAC and it is essential to reduce inputs in the catchment to limit inputs to the lake. Phosphate levels are above the target level on Llyn Dinam, and are also extremely high within the Llyn Penrhyn catchment area. Athough hydrological connections between Llyn Penrhyn and Llyn Dinam are unclear, the presence of such a high source

	Llyn Dinam SAC
	of P adjacent to the SAC is a significant risk. Other sources of inputs to the lakes may be point sources such as septic tanks and non-point sources such as spreading of fertiliser or abattoir waste on farmland or aerial deposition. Inputs may be tackled through catchment management (including Nitrate Sensitive Zone designation), agri-environment schemes and careful assessment of any proposals for new developments that may discharge nutrients. Bird populations, particularly those feeding off site but returning to roost, may also be responsible for input of nutrients, and populations of larger species such as Canada geese *Branta canadensis* should be monitored. **Air pollution** - Major impacts of air pollutants on grasslands in the UK as result from nutrients (especially nitrogen deposition), acid deposition, heavy metals, POPs and radioactive particles. Nitrogen deposition is of particular concern for oligotrophic water bodies, especially where there are elevated phosphate levels. Hydrophyte species richness is negatively related to winter nitrate concentration in European shallow lakes. Acid deposition is thought to be a minimal risk for *Chara* lakes, which are generally very well buffered. Other air pollution threats have largely unknown impact, but are not generally viewed as being of major concern at present. **Sea level rise** - Sea level rise leads to increased salinity of lake, modifying its chemistry and species composition. Overtopping (i.e. during winter storms) and groundwater penetration of seawater as well as deposition of sea spray are enough – though the latter is not sufficient on its own – to alter *Chara* lakes, especially as the sea gets closer to the water bodies with sea level rise. Once the salinity reaches a certain level the lake would become a brackish lagoon and when plants such as seaweeds start to establish, the habitat can probably be regarded as lost. **Fish populations/angling** - Introductions of new bottom-feeding fish species can stir up bottom sediments and release nutrients into the water column. Unlimiting the numbers of zooplanktonivorous fish can result in a phytoplankton dominated system developing. The introduction of angling to lakes currently not fished may lead to detrimental impacts.

	Llyn Dinam SAC
	Grazing - Grazing of lake margins should be limited to prevent poaching, dunging and bank erosion, all of which will have adverse impacts on water quality through input of nutrients and sediment to the water column.Grazing by zoo-plankton (and predation of zoo-plankton by fish) may also require intervention (biomanipulation). **Recreational use** – The expansion of the zone used for windsurfing or the increase in intensity or season can impact upon bird numbers and disturb bottom sediments. Recreational use may lead to increased disturbance, nutrient input and/or increased turbidity of water. **Invasive species** - Water fern *Azolla filiculoides* is present at low levels in Llyn Dinam. Other invasive aquatic species are present on Anglesey and could threaten the integrity of the site. They can be spread on boots, machinery, fishing tackle and by wildfowl.
Landowner/ Management Responsibility	• Isle of Anglesey/CCW
HRA/AA Studies undertaken that address this site	**HRA and AA of the Wales Spatial Plan Update (WSPU) National and Area Frameworks,** Welsh Assembly Government (June 2008, C4S) The HRA screening process concluded that the WSPU will likely have a significant impact upon this SAC. An Appropriate Assessment was therefore undertaken together with a further HRA carried out in greater detail in relation to the lower tier plans, action plans, and programmes which enable the delivery of the Welsh Spatial Plan. The AA found that key actions associated with the WSPU and in-combination effects with other plans and projects that may affect European sites include urban and economic development activities.

Site Name: Y Fenai a Bae Conway/Menai Strait and Conwy Bay

- **Location: 04 03 18 W/53 14 04 N**
- **SAC EU Code UK0030202**
- **Size: 26,483 ha**
- **Designation: SAC**

	Y Fenai a Bae Conway/Menai Strait and Conwy Bay SAC
Site Description	The Menai Strait and Conwy Bay SAC is a multiple interest site that has been selected as a SAC for 5 different types of marine habitat and associated wildlife that it supports (habitats listed in Annex I of the Habitats Directive). In relation to these qualifying habitats, the Menai Strait and Conwy Bay SAC is considered to be one of the best areas in the UK for: • Mudflats and sandflats not covered by seawater at low tide • Reefs • Sandbanks which are slightly covered by sea water all the time and to support a significant presence of: • Large shallow inlets and bays • Submerged or partially submerged sea caves The unique physiographic conditions of the Menai Strait and Conwy Bay make it an important site. The wide variation in environmental conditions, such as tide, shelter from wave exposure and turbidity results in a diverse mixture of habitats and their associated plant and animal communities. The fact that five Annex I habitats have qualified for inclusion in this one SAC makes it of especially high importance in relation to the main aim of the Directive in conserving biodiversity. The unusual physiographic conditions of the Menai Strait and Conwy Bay make it an important site, not only nationally but also in a European context. The variation in environmental conditions, such as tide, shelter from wave exposure and turbidity results in the presence of a diverse mixture of habitats and

	Y Fenai a Bae Conway/Menai Strait and Conwy Bay SAC
	their associated plant and animal communities. A major feature of the Menai Strait and Conwy Bay SAC is the continuum of ecological variation from within the most tide-swept, wave-sheltered narrows in the 'Swellies' section of the Menai Strait out into the more open, less tide-swept waters of Conwy Bay and the moderately wave-exposed Great and Little Ormes. The wide variety of physiographic conditions experienced within the site, including exposure to tidal currents and examples of differing wave action, turbidity (water clarity), rock / sediment type and aspect throughout the site, are reflected in the diverse mixture of marine habitats and their associated plant and animal assemblages.
Qualifying Features	Annex I habitats that are a primary reason for selection of this site: **1110 Sandbanks which are slightly covered by sea water all the time** **1140 Mudflats and sandflats not covered by seawater at low tide** **1170 Reefs** Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: **1160 Large shallow inlets and bays** **8330 Submerged or partially submerged sea caves**
Conservation Objectives	**Interest Feature 1: Sandbanks which are slightly covered by sea water all the time** **Interest Feature 2: Mudflats and sandflats not covered by seawater at low tide** **Interest Feature 3: Reefs** **Interest Feature 4: Large shallow inlets and bays** **Interest Feature 5: Submerged or partially submerged sea caves** To achieve favourable conservation status all of the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met restoration measures will be needed to achieve favourable conservation status. The overall distribution and extent of the habitat features within the site, and each of their main component parts should also be stable or

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	increasing. **Interest Feature 1: Sandbanks which are slightly covered by sea water all the time and** **Interest Feature 2: Mudflats and sandflats not covered by seawater at low tide:** • Muddy gravel communities • Dwarf eelgrass, Zostera noltei beds • Sediment communities at Traeth Lafan **Interest Feature 3: Reefs** • Reef communities in high energy wave-sheltered, tide-swept conditions • Under-boulder, overhang and crevice communities • Limestone reef communities • Clay outcrop reef communities **Interest Feature 4: Large shallow inlets and bays:** • Organically enriched muddy sediment areas Other conservation objectives for designated features within this SAC include the following: • The physical biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded. Important elements include; geology, sedimentology, geomorphology, hydrography and meteorology, water and sediment chemistry, and biological interactions. • Nutrient levels in the water column and sediments to be at or below existing statutory guideline concentrations, and within ranges that are not potentially detrimental to the long term maintenance of the features species populations, their abundance and range. • Contaminant levels in the water column and sediments derived from human activity to be at or below existing statutory guideline concentrations and below levels that would potentially result in

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	increase in contaminant concentrations within sediments or biota. They should also be below levels potentially detrimental to the long-term maintenance of the features species populations, their abundance or range. • Some reef features such as underboulder, overhang and crevice communities, and of some mudflat and sandflat features such as the muddy gravel habitats and sheltered muddy habitats require restoration and/or recovery. All of these habitats are also part of the large inlets and bays feature. • The presence, abundance, condition and diversity of typical species is such that habitat quality is not degraded. Important elements include: species richness, population structure and dynamics, physiological heath, reproductive capacity, recruitment, mobility and range. • Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term. • The management and control of activities or operations likely to adversely affect the habitat feature, is appropriate for maintaining it in favourable condition and is secure in the long term.
Component SSSIs	SSSs that are partly or wholly within the SAC: Arfordir Gogleddol Penmon – North Penmon Coast Glannau Penmon – Biwmares – Penmon to Beaumaris shore Glannau Porthaethwy – Menai Bridge Shore Y Foryd – Foryd Bay Traeth Lafan – Lavan Sands Aber Afon Conwy – Conwy Estuary Pen Y Gogarth – Great Ormes Head Criegiau Rhiwledyn – Little Ormes Head

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Key Environmental Conditions (factors that maintain site integrity)	**The maintenance of the following pressures at tolerable levels are required to ensure site integrity is retained:** ▪ Fisheries ▪ Coastal development and other disturbances ▪ Climate change ▪ Non-indigenous species ▪ Wasting disease of eelgrass beds ▪ Coastal erosion/sea level rise ▪ Water quality ▪ Offshore disturbance
SAC Condition Assessment	**Feature 1: Sandbanks which are slightly covered by sea water all the time:** Favourable condition. **Feature 2: Mudflats and sandflats not covered by seawater at low tide:** Unfavourable condition. **Feature 3: Reefs:** Unfavourable condition. **Feature 4: Large shallow inlets and bays:** Unfavourable condition. **Feature 5: Submerged or partially submerged sea caves:** Favourable condition.
Vulnerabilities (includes existing pressures and trends)	**Sandbanks which are slightly covered by sea water all the time** Main pressures are: Fish and Shellfish Aquaculture, Professional fishing, Trawling, Drift-net fishing, Leisure fishing, Sand and gravel extraction, exploration and extraction of oil or gas, Urbanised areas, human habitation, Industrial or commercial areas, Discharges, Port areas, Energy transport, Pipe lines, Shipping, pollution, water pollution, Modification of hydrographic functioning/general, Modification of marine currents, Dumping/depositing of dredged deposits, Sea defence or coast protection works, Erosion, Euthrophication, Invasion of a species, Interspecific faunal relations, Other forms or mixed forms of interspecific faunal competition, Genetic pollution, and the introduction

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	of disease. **Fisheries -** Fishing activities are the most widespread source of anthropogenic physical disturbance of benthic communities in Northern Europe and represent the most significant human activity causing change in the UK marine environment (de Groot and Lindeboom, 1994, Laffoley and Tasker 2004). Of the six "Class A - Priority Human Pressures" identified by OSPAR, fisheries account for three (OSPAR, 2000). The effects of fisheries include (Laffoley and Tasker 2004): ▪ Removal of target species (including genetic effects) – given the size of most fish stocks the fishing pressure exerted upon them is outside safe biological limits ▪ Mortality of non-target species; Physical disturbance of the seabed ▪ Shifts in community structure ▪ Indirect effects on the food web There is also evidence indicating that over-fishing is often a precondition for eutrophication, disease outbreaks, or species introductions (Jackson *et al*. 2001). The combined effect of all these impacts is to reduce the overall stability of marine ecosystems (Royal Commission on Environmental Pollution, 2004). It is often difficult to establish direct relationships between specific fisheries activities and ecological effects as many ecosystem properties and components that are affected directly or indirectly by fishing also show substantial natural variability. In addition, there are many gaps in our knowledge of marine ecological processes and so it is not always possible to establish clear links between ecological change and environmental or anthropogenic factors. Unlicensed commercial fishing is considered to be one of the most significant threats to marine biodiversity (Boyes *et al*., 2006). However, the effect of this is currently unquantified due to lack of data on unlicensed activities of vessels under 11m. Sandy seabeds are frequently found in areas

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	where the seabed is relatively mobile, and therefore can be considered to be relatively resilient to impact. In most cases, the first pass of a trawl over an unfished benthic habitat will cause the greatest change, and some muddy-sand seabeds can show trawl tracks for many months after a single impact. The development of new gears and techniques for fishing over previously unfished grounds thus causes great damage to the marine environment (Laffoley and Tasker, 2004). In most areas of the continental shelf, damage is being inflicted on communities already substantially changed by fishing. Trawling over naturally less disturbed mud or gravel seabeds can have even longer-term impacts for years (Royal Commission on Environmental Pollution, 2004). Although fauna living in more dynamic and mobile habitats are likely to be adapted to continual disturbance and thus more resilient to the effects of trawling (Kaiser and Spencer, 1996), the effects of disturbance are additive and can thus exceed the background levels to become ecologically significant (Royal Commission on Environmental Pollution, 2004). Moreover, fishing with demersal gear on stable sediments has significant structural impacts upon benthic communities and can lead to long-term changes if fishing is frequently repeated (Kaiser *et al*., 1999). Rumohr and Kujawski (2000) suggested that fisheries impacts have led to a switch in the dominant benthic fauna in the North Sea, from infaunal bivalve communities to assemblages such as echinoderms and crustaceans, which scavenge on fishing discards or on organisms damaged by the passage of fishing gear. Trawling therefore causes a significantly reduced diversity and abundance of infauna, whilst encouraging an increase in rapidly reproducing species (Rumohr and Kujawski, 2000). **Coastal development and other disturbances -** Sandbank habitats are subjected to a variety of anthropogenic factors (Elliott *et al*, 1998), the most significant of which include: ▪ Physical disturbance by fishing and aggregate dredging activities ▪ Construction of rigs, jetties and onshore development ▪ Offshore development (for example, wind turbine arrays and other renewables) ▪ Pollutants and sediments in riverine discharge ▪ Physical disturbances are particularly damaging to sandbanks

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	For example, aggregate extraction affects the nature, size and depth of substratum material, leading to long-term habitat destruction as well as disturbing the light regime through sediment disturbance. Fishing activities potentially have similar physical effects (for example, the intense perturbation caused by beam trawling activity), but have a greater effect upon biological communities (as described above). The trophic structure of communities can be greatly altered, mainly by removal of predators and larger slow-growing epibenthic fauna, whose populations are very slow to recover from perturbation (for example, *Pecten maximus*). These effects are of particular concern for offshore sandbanks. In addition, any disturbance that interferes with the hydrological regime in the vicinity of sandbanks can be detrimental, as maintenance of sandbanks is dependent upon current direction and speed. Land claim, adjacent coastal development, cable laying and construction of sea defences all potentially change the hydrological regime. However, there is a presumption against coastal development in Wales (TAN 14 - Welsh Assembly). Thus, future coastal development is not considered to be the most significant threat to sandbanks, but development that is already in place may have an influence on their future status. Nevertheless the future impact of offshore and nearshore development should not be downplayed as offshore wind farms, for which sandbanks offer good siting potential, will have impacts on these habitats. **Climate change -** It is accepted that global climate change will modify habitats and ecosystems worldwide, not least in the marine environment. Shoreline areas will be affected by sea level rise and an increase in storms and winds resulting in changes to the distribution and composition of some shoreline habitats (Brooker and Young, 2005). Sea level rise will also significantly impact the intertidal zone resulting in a decrease in area in some places. Sandbanks will also be affected by sea level rise and by storms, both of which can alter their morphology significantly (Dyer and Huntley, 1997; Stansby *et al*., 2006), and thus are of particular concern. Changes in the length of growing and breeding seasons, community composition and species

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	ranges are likely to continue (Brooker and Young, 2005). Increasing temperatures can alter the timing of ecological processes and there is therefore potential for temporal mismatch between trophic levels. Generally, warm water species are likely to replace cold water species, with cold water species moving to more northerly latitudes or greater depths (Brooker and Young, 2005). Patterns of species response to climate change are not straightforward, due to factors such as current flow, which may also change, and barriers to species movement. The positive effects of increased temperatures, for example increased primary productivity may be offset by the negative impacts of increased disturbance from wave and storm surge action (Brooker and Young, 2005). There has already been a change in plankton species composition and abundance with a major shift in trends recorded in the early 1980s (Hays *et al*., 2005). This shift affects a large area of the North Atlantic and appears to be linked to changes in the North Atlantic Oscillation and climate (Hays *et al*., 2005). Uncertainties exist for many predictions including: species specific responses to climate change; the capacity of species from different habitats to migrate in response to a changing climate; the possible influx of new invasive species; the impact of increasing ocean acidity due to absorption of atmospheric CO2. In addition, changes in certain activities as a result of climate change, in particular those caused by sea level rise could also have an impact on the marine environment. For example, managed retreat to enable persistence of some coastal habitats might be inhibited by coastal development and construction of sea. H1110 Sandbanks which are slightly covered by sea water all the time defences, whilst changes in fishing policy will substantially alter the pressure on the marine biodiversity resource. **Non-indigenous species -** Non-indigenous species (NIS) present a significant threat to the marine environment and their effects can have both economic and ecological ramifications, including

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	biodiversity loss (for example, Ruiz *et al*. 1997; Cohen and Carlton 1998). The deleterious impacts of NIS have been shown across global regions, habitat types, and taxonomic groups worldwide, including marine systems (Ruiz *et al*., 1997; Cohen and Carlton, 1998; Ruiz *et al*., 2000). Within marine systems, ships' ballast water, used to improve ship stability and trim, is one of the primary mechanisms for the transport and introduction of non-indigenous marine species to ports worldwide (Carlton, 1996). Given the continued growth of global trade and the complexity of shipping patterns globally, with numerous different source regions, ship types and routes operating worldwide, it is clear that non-indigenous species will continue to be transferred to UK waters for the foreseeable future. There is some legislation currently in place to reduce the introduction of NIS via Ballast Water through the International Maritime Organization (International Maritime Organisation, 2004). This legislation aims to limit the number of viable organisms within ballast tanks in the future, but NIS remain a grave concern, and could potentially lead to habitat alteration and biodiversity loss within marine Annex I habitat features. Our ability to predict invasions is severely limited by the complexity of the invasion process itself, and therefore it is difficult to identify those marine Annex I features that are at greatest risk. Nonetheless, certain areas are known to be at a particularly high risk: ▪ Areas within the vicinity of ports. Because the marine environment is essentially an open system, there is also potential for rapid and widespread secondary transfer of NIS within the UK once species establish reproducing populations; ▪ Areas with a high diversity of habitat types (including diversity of substrate, salinity and temperature regimes and exposure). These habitats are most likely to be successfully invaded because, as the number of habitat types increases, so does the chance that a particular species will locate a suitable habitat for its establishment; ▪ Areas already altered or damaged by anthropogenic effects; ▪ Areas that have already been invaded by high numbers of NIS;

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	▪ Areas of low indigenous species richness. Brackish water conditions, for example, such as those found in estuaries, generally support low diversity. Based on these criteria, it would seem that inshore sandbanks are more at risk than those offshore, but it is unlikely that we will be able to accurately predict which species will arrive and establish or what their impacts might be on native communities in the future. Though impacts of NIS can be minimal, they can also include massive population growth and subsequent displacement of native species. For one sub-type of this feature, eelgrass beds, there is some evidence that the invasive weed, Sargassum muticum, could directly threaten eelgrass beds by competing for space (den Hartog, 1997), and this is an ongoing concern. **Wasting disease of eelgrass beds -** Wasting disease, which affects eelgrass beds (a sub-type of 'sandbanks which are slightly covered in sea water all of the time'), is a significant threat to this Annex I sub-type. The disease causes eelgrass to die away over time, the leaves detaching from the main plant and the regenerative shoots decay. This disease appears to have occurred globally during the 1920s and 1930s and re-occurred in the 1980s (Butcher, 1933, Giesen *et al*., 1990; Short *et al*., 1986). The causes of the disease are not fully understood, and theories range from sunshine deficiency, extremes of temperature to pathogenic causes such as protozoan, fungal or bacterial infection (Butcher, 1941 and other references cited in Davison, 1997). However, the cause has never been clearly established. It is known that the disease is still present, thus future epidemics seem likely and are of grave concern as die-offs of up to 90% of plants within a population have been reported (Whelan and Cullinane, 1987). **Mudflats and sandflats not covered by seawater at low tide** Main pressures are: Fish and shellfish aquaculture, Professional fishing, Fixed location fishing, Leisure fishing, Bait digging, trampling/overuse, Erosion, Dykes/Embankments/artificial beaches/general, urbanized areas/human habitation, Industrial or commercial areas, Port areas,

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	Sport and leirsure structures, Nautical sports, Motorised vehicles, Discharges, Pollution, Water pollution, Eutrophication, Genetic pollution, Interspecific faunal and floral relations, and invasion by a species. **Fisheries -** Fishing activities are the most widespread source of anthropogenic physical disturbance of benthic communities of Northern Europe and represent the most significant human activity causing change in the UK's marine environment (de Groot and Lindeboom, 1994, LaFolley and Tasker 2004). Of the six "Class A - Priority Human Pressures" identified by OSPAR, fisheries account for three (OSPAR, 2000). The effects of fisheries include (Laffoley and Tasker 2004): ▪ Removal of target species (including genetic effects) – given the size of most fish stocks the fishing pressure exerted upon them is outside safe biological limits Second Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2001 to December 2006 ▪ Mortality of non-target species ▪ Physical disturbance of the seabed ▪ Shifts in community structure ▪ Indirect effects on the food web There is also evidence indicating that over-fishing is often a precondition for eutrophication, disease outbreaks, or species introductions (Jackson *et al*. 2001). The combined effect of all these impacts is to reduce the overall stability of marine ecosystems (Royal Commission on Environmental Pollution, 2004). It is often difficult to establish direct relationships between specific fisheries activities and ecological effects as many ecosystem properties and components that are affected directly or indirectly by fishing also show substantial natural variability. In addition, there are many gaps in our knowledge of marine ecological processes and so it is not always possible to establish clear links between ecological change and environmental or anthropogenic factors. Unlicensed commercial fishing is considered to be one of the top threats to marine biodiversity

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	(Boyes *et al*., 2006) However, the effect of this is currently unquantified due to the lack of data on unlicensed activities of vessels under 11m. Marine invertebrate species are commercially and subsistence harvested from intertidal areas. Although most are harvested for human consumption (for example, Hall and Harding, 1997; Ferns *et al*., 2000), some are also collected for use as bait (Olive, 1993). It has been shown that intertidal soft-sediment communities composed mainly of large bodied sessile organisms and biogenic habitat such as seagrass, serpulid worms and mussel beds have a low tolerance to disturbance and can take years to recover, even if harvesting techniques are non-mechanical (Kaiser *et al*., 1999). Cockle collecting occurs on some sand and mudflats, and whilst the effects of hand gathering may be negligible or have impacts on shorter time scales, undersized cockles may be damaged (Kaiser *et al*., 1999). Mechanical harvesting may have a significant impact on abundance and diversity of intertidal organisms, leading to longer term effects (Sewell and Hiscock, 2005). A study in the Wadden Sea indicated that it took three years for the density of lugworms and five years for the density of Mya arenaria to return to pre-exploitation levels following mechanical lugworm harvesting on a tidal mudflat (Beukema, 1995). Bait digging occurs at different scales from personal use to commercial collection, most of which is unlicensed and thus not quantifiable (Boyes *et al*., 2006) but all types can cause significant impacts. Digging brings coarser sediments, including pebbles and cobbles, to the surface layers changing the substratum type with significant effects on the infaunal community (Boyes *et al*., 2006). Dredging and trawling gear can cause death or severe damage to benthos and physical disturbance to sediment structure. The degree of the impact depends on towing speed, gear size and weight, substrate type and local hydrodynamic factors. Trawling impacts are naturally less severe in areas naturally impacted by storms and wave disturbance. Otter trawl boards may penetrate into soft sediments by 6 – 20 cm. The tickler chains from beam trawls plough sediments to a depth of 4 – 8 cm (Royal Commission on Environmental Pollution, 2004). By-catch from suction dredging (for shellfish) or of juvenile flatfish (from the shrimp fisheries) may have a significant effect on non-target

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	populations (UKBAP, 2006). Intertidal eel grass beds (Zostera sp) on mudflats and areas of intertidal sand are potentially vulnerable to trampling by bait collectors, clam and cockle digging or raking. Studies have shown that while raking is less damaging than digging, both can potentially lead to loss of plant biomass and can take a long time to recover due to damage to their root system (Sewell and Hiscock, 2005). **Climate change -** There is at present no general agreement about the degree of physical change that might be acceptable in the marine environment. It is therefore not currently possible to define what is acceptable coastal erosion (Second Report by the United Kingdom under Article 17 on the implementation of the Directive from January 2001 to December 2006) and coastal flooding risk. Shoreline areas will be affected by increased storminess and windiness: the distribution of some shoreline habitats may be altered or reduced by these effects. In addition sea level rise will significantly impact on the distribution and extent of sand and mudflat habitats (Brooker and Young, 2005). There has already been a major change in the plankton species and abundance since the early 1980s (Hays *et al*, 2005). This affects a large area of the North Atlantic and appears to be linked to changes in the North Atlantic Oscillation and climate (Defra, 2005). Patterns of species response to climate change are not straightforward, due to factors such as current flow and barriers to species movement. The positive effects of increased temperatures, for example increased primary productivity may be offset by the negative impacts of increased disturbance from wave and storm surge action (Brooker and Young, 2005). All of these effects may affect the structure and function of estuaries; however, uncertainties exist with respect to predictions including: species specific responses to climate change; the possible influx of new invasive species; the impact of increasing ocean acidity due to absorption of atmospheric CO2. In addition, sectoral activities – for example, managed retreat to enable persistence of some coastal habitats might be inhibited by coastal development and construction of sea defences, whilst changes in fishing policy

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	will substantially alter the pressure on the marine biodiversity resource. **Coastal erosion/sea level rise** - Coastal erosion as a result of waves, storm action and the generally soft nature of the coastline is a major concern in some areas. Transport of the resultant suspended material tends to be inshore into many estuaries and results in siltation of harbour and port areas necessitating continuous dredging (Defra, 2005). Many beach areas around Scotland are currently also suffering loss of sand, largely, it is thought, due to lack of supply of new material from offshore (Defra, 2005). Sedimentary areas protected by hard defences will suffer the greatest impact of sea level rise (Boorman *et al*, 1989). Erosive forces are predicted to become more dominant (due to increased wave action) and losses of fine sediment will therefore produce narrower intertidal areas, with coarser sediment. The subsequent change to sediment characteristics will include a reduction in the amount of organic matter in the sediments and a change to community structure. Taken to its conclusion, a greater proportion of estuaries on open-coasts are likely to become marine and sandy, and brackish waters will ingress inland and up-river. In more sheltered areas, there will be more deposition, extending areas of fine sediment and marsh. However, this process will cease once the sediment supply is reduced and ultimately erosion would become the dominant process (Boorman *et al*, 1989). The combined effects of coastal erosion, sea level rise and the high cost of maintaining sea defences in areas such as the south-east are matters of concern. There has been a decision in principle to work with natural sedimentary processes in managing these problems. If relative sea level rise continues to occur at present rates, it will necessitate a number of difficult decisions and call for novel engineering solutions - both hard and soft. It will also necessitate the establishment of an appropriate balance between managed retreat and construction of higher and stronger sea defences (Defra, 2005). There are no UK-wide projections for how this would affect intertidal sediments as a whole, however it has been estimated that sea level rise will result in a loss of 8000

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	to 10,000 ha of intertidal flats in England by 2013 (Pye and French, 1993). Much of this loss is expected in southern and south-east England although research suggests that the major firths in Scotland will also be affected (UKBAP, 2006). **Coastal development** - There is a presumption against coastal development in GB which is described by the following planning policy documents; NPPG 13 (Scotland) (Scottish Executive, 2006) TAN 14 (Wales) (Welsh Assembly Government, 1998) PPG 20 (England) (Department of Environment, 1992) – the following is taken from NPPG 13. The presumption against development includes projects for which a coastal location is not required; projects that are approved should be accommodated on the developed coast, reuse available suitable brownfield land, incorporate conservation interests and work within natural processes at work on the coast. In addition where potential damage to the environment is both uncertain and significant, a precautionary approach is required and the criteria required by the various bodies responsible for environmental protection should be met. With a few notable exceptions few major coastal construction projects are currently planned or in progress and those that are, are required to provide mitigation for areas of habitat loss (Defra, 2005). Barrage schemes for water storage, amenity, tidal power and flood defence continue to pose a threat to the integrity and ecological value of mudflats in estuaries and enclosed bays (UKBAP, 2006b and 2006c). The proposed Severn Barrage could cause up to 50% loss of intertidal area of the estuary (8000 ha) which would be approximately 2.7 % of the UK sand and mudflat resource (Mitchell *et al*, 1981). Intertidal eel grass beds on mudflats and sandflats are highly vulnerable to boat anchorages and local boating activities, particularly launching across the eel grass beds. Use of vehicles on the sediment flats changes the drainage and cuts channels along which increased erosion of the eel grass rhizomes occurs.

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	Water Quality - Diffuse and point source discharges from agriculture, industry and urban areas, including polluted stormwater run-off, can create abiotic areas or produce algal mats which may affect invertebrate communities. They can also remove embedded fauna and destabilising sediments thus making them liable to erode (UKBAP, 2006). Oil and gas extraction and related activities, and dredging for navigation, have an important effect on sediment biota and on sediment supply and transport. Many coastal areas, including estuaries, are now either licensed or available for exploration and development (UKBAP, 2006). **Non-Indigenous Species** - Non-indigenous species (NIS) present a significant threat to the marine environment and their effects can have both economic and ecological ramifications, including biodiversity loss (for example, Ruiz *et al*. 1997; Cohen and Carlton 1998). The deleterious impacts of NISs have been shown across global regions, habitat types, and taxonomic groups worldwide, including marine systems (Ruiz *et al*., 1997; Cohen and Carlton, 1998; Ruiz *et al*., 2000). Within marine systems, ships' ballast water, used to improve ship stability and trim, is one of the primary mechanisms for the transport and introduction of non-indigenous marine species to ports worldwide (Carlton, 1996). Given the continued growth of global trade and the complexity of shipping patterns globally, with numerous different source regions, ship types and routes operating worldwide, it is clear that non-indigenous species will continue to be transferred to UK waters for the foreseeable future. There is some legislation currently in place to reduce the introduction of NIS via Ballast Water through the International Maritime Organisation (International Maritime Organisation, 2004). This legislation aims to limit the number of viable organisms within ballast tanks in the future, but NIS remain a grave concern, and could potentially lead to habitat alteration and biodiversity loss within marine Annex I habitat features. Our ability to predict invasions are severely limited by the complexity of the invasion process itself, and therefore it is difficult to identify those marine Annex I features that are at greatest risk.

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	Nonetheless, certain areas are known to be at a particularly high risk: (i) Areas within the vicinity of ports. Because the marine environment is essentially an open system, there is also potential for rapid and widespread secondary transfer of NIS within the UK once species establish reproducing populations. (ii) Areas with a high diversity of habitat types (including diversity of substrate, salinity and temperature regimes and exposure). These habitats are most likely to be successfully invaded because, as the number of habitat types increases, so does the chance that a particular species will locate a suitable habitat for its establishment. (iii) Areas already altered or damaged by anthropogenic effects. (iv) Areas that have already been invaded by high numbers of NIS. (v) Areas of low indigenous species richness. Brackish water conditions, for example, such as those found in estuaries generally support low diversity For mudflats and sandflats it is unlikely that we will be able to accurately predict which species will arrive, establish or what their impacts might be on native communities in the future. Estuaries in particular are susceptible to NIS (for example, Ruiz *et al*. 1997; Cohen and Carlton 1998). For example the spread of cord-grass Spartina anglica which has vegetated some upper-shore mudflat areas with important ecological consequences in some areas (UKBAP, 2006). **Reefs** Main pressures are: Fish and Shellfish Aquaculture, Professional fishing, Fixed location fishing, Trawling, Leisure fishing, Taking / Removal of fauna and flora/ general, Urbanised areas/ human habitation, Industrial or commercial areas, Discharges, Nautical sports, Other leisure and tourism impacts, Trampling/ overuse, Landfill/ land reclamation and drying out/general, Modification of marine currents, Dumping/depositing of dredged deposits, Sea defense or coast protection works, Eurrophication, Natural catastrophes, Pollution, Water pollution, Invasion by a species, Interspecific faunal and floral relations, Genetic pollution.

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	Fisheries -Fishing activities are the most widespread source of anthropogenic physical disturbance of benthic communities in Northern Europe and represent the most significant human activity causing change in the UK marine environment (de Groot and Lindeboom, 1994, Laffoley and Tasker 2004). Of the six "Class A - Priority Human Pressures" identified by OSPAR, fisheries account for three (OSPAR, 2000). The effects of fisheries include (Laffoley and Tasker 2004): • Removal of target species (including genetic effects) – given the size of most fish stocks the fishing pressure exerted upon them is outside safe biological limits • Mortality of non-target species • Physical disturbance of the seabed • Shifts in community structure • Indirect effects on the food web There is also evidence indicating that over-fishing is often a precondition for eutrophication, disease outbreaks, or species introductions (Jackson *et al*. 2001). The combined effect of all these impacts is to reduce the overall stability of marine ecosystems (Royal Commission on Environmental Pollution, 2004). It is often difficult to establish direct relationships between specific fisheries activities and ecological effects as many ecosystem properties and components that are affected directly or indirectly by fishing also show substantial natural variability. In addition, there are many gaps in our knowledge of marine ecological processes and so it is not always possible to establish clear links between ecological change and environmental or anthropogenic factors. Unlicensed commercial fishing is considered to be one of the most important to marine biodiversity (Boyes *et al*., 2006) However, the effect of this is currently unquantified due to the lack of data on the activities of vessels under 11m. **Rocky Reef:** Intertidal reefs are subject to bait collection and collection of large crustaceans. Where

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	collection involves boulder-turning, substantial damage may be done as boulders are often not returned to their original positions (Sewell and Hiscock, 2005). Sublittoral rock reefs are mainly fished using static gear for crustaceans. The main damage associated with these is displacement or crushing of sessile organisms when the gear is placed or retrieved (Sewell and Hiscock, 2005). Diver collection of crustaceans is minimal but may significantly reduce stocks of large crustaceans. Tangle nets are used to catch crawfish and sessile invertebrate species may also be tangled and removed (Sewell and Hiscock, 2005). Mobile fishing gear may not directly cross reefs but the activities of dredging and trawling on surrounding soft sediments can affect the surrounding reefs. Dredging results in the suspension of fine sediment and studies have shown that it can double the suspended matter content of the water, an effect that is likely to persist for several days. Whilst the increase in suspended particulates may benefit filter feeders, many species are adversely affected by smothering (Hartnoll, 1998). In some cases where reef structures are low-lying and will not damage the gear, reefs are dredged directly. This can have a substantial impact on the communities as seen in Lyme Bay, Devon (Sewell and Hiscock, 2005). Such impacts are worsened if the substratum is soft rock, in which case the reef is vulnerable to irreversible structural damage as well as removal of epifauna. Offshore fisheries employing demersal trawls are known to break off pieces of Lophelia pertusa reef, removing reef clumps and causing physical damage to the associated reef species and seabed. There is good evidence that the repeated use of heavy rock-hopper gear and otter trawls will flatten and destroy even very substantial reefs and should be regarded as a significant threat to such structures (UKBAP, 2006e, Sewell and Hiscock, 2005). Trawled areas of deep-water coral are often sparse and characterized by coral rubble, leaving broken up fragments of coral, with much lower habitat complexity and species diversity than unimpacted reef areas. Again re-suspension of sediments may smother reefs. In addition to the physical impacts on the reef itself, many of the species targeted by fisheries in deep water areas are especially vulnerable to the effects of over

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	fishing due to their long life histories (Sewell and Hiscock, 2005). **Biogenic reef:** The encrusting epifaunal species typical of biogenic reefs create complex microhabitats that are able to support species assemblages with relatively high diversity. Often this creates a habitat for species that are not otherwise found on the surrounding seabed (Royal Commission on Environmental Pollution, 2004). These complex habitats increase the survival of juvenile commercial fish species by reducing predation pressure. Thus, the removal of biogenic structures affects not only the benthos but also the associated species that feed and shelter around them (Kaiser *et al*, 1999). Many reef building species are slow growing and recovery of reefs impacted by trawling is expected to take many decades or centuries. In most cases, the first pass of trawl gear is sufficient to damage or destroy some areas permanently (Royal Commission on Environmental Pollution, 2004). Sabellaria alveolata reefs are easily damaged by physical impact associated with trampling and are also sometimes gathered by anglers for use as bait. However, there is evidence that following physical damage, the worms themselves are often unaffected. (Sewell and Hiscock, 2005). It has been suggested that Sabellaria reefs may also be able to withstand the impact of a lightweight beam trawl, though this may not be true for repeated trawling (Sewell and Hiscock, 2005). **Climate change** - There is at present no general agreement about the degree of physical change that might be acceptable in the marine environment. Shoreline areas will be affected by increased storminess and windiness and sea level rise; the distribution of some shoreline habitats may be altered or reduced by these effects (Brooker and Young, 2005). There has already been a major change in the plankton, both in species and abundance terms since the early 1980s. This affects a large area of the North Atlantic and appears to be linked to changes in the North Atlantic Oscillation and climate (Defra, 2005). We have changed the diversity, dynamics and composition of marine life by the introduction of non-native species and by changes in the

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	relative abundance of species from fisheries (Brooker and Young, 2005). Changes in the length of growing and breeding seasons, community composition and species ranges are likely to continue. Increasing temperatures can alter the timing of ecological processes and there is therefore potential for temporal mismatch between trophic levels. Generally, warm water species are likely to replace cold water species, with cold water species moving to more northerly latitudes or greater depths (Brooker and Young, 2005). Populations of some rocky shore species are particularly responsive to temperature changes, particularly those at the edges of their latitudinal ranges, and have been used as indicators of climatic change (Hill *et al*, 1998). Depletion of the northern ozone layer may result in depth distribution changes and reduced productivity of the kelp species, with uncertain consequences for the kelp biotopes (Birkett *et al*, 1998). Patterns of species response to climate change are not straightforward, due to factors such as current flow and barriers to species movement. The positive effects of increased temperatures, for example increased primary productivity may be offset by the negative impacts of increased disturbance from wave and storm surge action (Brooker and Young, 2005). Uncertainties exist with respect to any predictions including: species specific responses to climate change;the capacity of species from different habitats to migrate in response to a changing climate; the possible influx of new invasive species; the impact of increasing ocean acidity due to absorption of atmospheric CO2. In addition, sectoral activities – for example, managed retreat to enable persistence of some coastal habitats might be inhibited by coastal development and construction of sea defences, whilst changes in fishing policy will substantially alter the pressure on the marine biodiversity resource (Defra, 2005). So far, there are no studies on the sensitivity of cold-water corals to CO2-related changes in seawater chemistry. However, because of the comparatively uniform response of all calcifying organisms tested so far, it is reasonable to expect that calcification of cold-water corals will also be

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	reduced as carbonate supersaturation declines. Because the carbonate saturation state generally decreases with latitude and water depth, the conditions in waters typically inhabited by cold-water corals are less Favourable for calcification to start with. This may cause cold-water corals to be affected earlier and more strongly by CO2-related ocean acidification than warm-water species (The Royal Society, 2005). This process will also affect other reef building species, calcareous algae and associated reef organisms with calcareous parts (for example, crustacean exoskeletons) (Haughan *et al*, 2006). **Coastal development and other disturbances** – In most regions construction has taken place to a greater or lesser extent to create ports, harbours and urban areas. These various constructions have altered both the shape of the coastline and the variety and type of habitats available for wildlife (Defra, 2005). In the past little attention was paid to the consequences of coastal and offshore construction but the agreement of other marine interests must now be sought whenever any form of construction is contemplated. This requirement applies whatever the construction proposal. Few major coastal construction projects are currently planned or in progress (Defra, 2005). Coastal constructions may provide suitable habitats for rocky reef organisms in sedimentary areas or represent a threat due to the reduction in structural complexity of rocky shores. Other artificial substrata and some introduced species may have positive effects (Hill *et al*, 1998). **Offshore development and aggregate extraction -** Government departments are responsible for the assessment of the potential impacts of oil and gas exploration and production aggregate extraction, marine construction work, land reclamation and dumping of dredged material prior to licensing. The conditions attached to these licences can stipulate that measures are adopted to minimise environmental impacts. Licenses may be refused on environmental grounds. The EIA Directive requires oil companies to conduct an environmental impact assessment before any operations take place. The assessments are then scrutinised by DTI and statutory consultees (JNCC, FRS and Defra). The Directive is implemented through the Offshore Petroleum Production and Pipelines (Assessment of Environmental Effects) Regulations 1999.

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	There are currently over 70 production licences producing approximately 22 million tonnes of material per annum (Crown Estate, 2004). These only cover about 0.12% of the UK continental shelf. Of this about 12% is actively dredged each year, which equated to 144 square kilometres in 2003, a reduction of some 114 square kilometres since 1998. The physical impacts of marine aggregate extraction arise from removing the substrata and altering the seabed topography; creation of a turbidity plume within the water column in the area of activity, and sediment re-deposition. Dredging disturbs the benthic community and can reduce the number and diversity of benthic species (Jones *et al*, 2004). The development of the North East Atlantic oil fields is being undertaken in areas where *Lophelia pertusa* is found. This development is in an 'unfamiliar' environment and due to data limitations, oil companies suggest that the model predictions provided in their environmental assessments can only be considered to be indicative of the expected pattern of deposition on the seabed and hence possible impact on reefs (UKBAP, 2006). **Pollution -**The effects of pollution on reefs are largely known from the rocky intertidal. Some species are particularly sensitive to contaminants, notably dog whelks driven locally to extinction by tributyl tin leached from anti-fouling paints. Rocky shore communities are sensitive to a range of environmental impacts from chronic low impacts such as sewage pollution, through to acute factors including red tides and oil spills. Generally, the effects of chronic impacts on rocky shores are reversible provided the disturbance is stopped. Recovery (defined as a return to the normal community structure and dynamics) from acute impacts is also possible but may take much longer depending on the scale of the impact (Hill *et al*, 1998). **Non-Indigenous Species -** Non-indigenous species (NIS) present a significant threat to the marine environment and their effects can have both economic and ecological ramifications, including biodiversity loss. The deleterious impacts of NIS have been shown across global regions, habitat

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	types, and taxonomic groups worldwide. In marine ecosystems, ships' ballast water and fouled hulls are the primary mechanisms for the transport and introduction of non-indigenous marine species to ports worldwide (Cohen and Carlton, 1998). Given the continued growth of global trade and the complexity of shipping patterns globally, it is clear that nonindigenous species will continue to be transferred to UK waters for the foreseeable future. There is some legislation currently in process to reduce the introduction of NIS via Ballast Water through the International Maritime Organization (International Maritime Organization, 2004). This legislation aims to limit the number of viable organisms within ballast tanks upon arrival in port. Though this will in theory reduce the risk of introduction via shipping, the techniques to reduce density are still in the Research and Development phase and therefore the effectiveness of this legislation in the long term remains to be seen. Due to this uncertainty, NIS remains a grave concern for Annex 1 features. Our capacity to predict invasions is severely limited by the complexity of the process, which is influenced by numerous factors associated with introduction, establishment and subsequent growth and range expansion of introduced species. Because of our limited predictive capacity in relation to NIS, it is difficult to identify those Annex 1 features that are at greatest risk, and thus we must consider all of them to be threatened to some degree by NIS. Nonetheless, certain areas are known to be at a particular high risk (Ruiz *et al*. 1997). **Large shallow inlets and bays** Main pressures are: Fish and Shellfish Aquaculture, Professional fishing, fixed location fishing, trawling, Leisure fishing, bait digging, Taking/Removal of fauna/general, Taking/Removal of flora/general, Exploration and extraction of oil or gas, Urbanised areas/human habitation, Industrial or commercial areas, Discharges, port areas, Energy transport, pipe lines, Shipping, Sport and leisure structures, nautical sports, Pollution, water pollution, Dumping/depositing of dredged

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	deposits, Sand and gravel extraction, removal of beach materials, Landfill/land reclamation and drying out/general, polderisation, reclamation of land from sea, estuary or marsh, sea defense or coast protection works, Erosion, invasion by a species, Interspecific faunal relations, introduction of disease, other forms or mixed forms of interspecific faunal competition. **Fisheries -** Communities in Northern Europe and represent the most significant human activity causing change in the UK marine environment (de Groot and Lindeboom 1994; Laffoley and Tasker 2004). Of the six "Class A - Priority Human Pressures" identified by OSPAR, fisheries account for three (OSPAR 2000). The effects of fisheries include (Laffoley and Tasker 2004): Removal of target species (including genetic effects) – given the size of most fish stocks the fishing pressure exerted upon them is outside safe biological limits Mortality of non-target species Physical disturbance of the seabed Shifts in community structure Indirect effects on the food web There is also evidence indicating that over-fishing is often a precondition for eutrophication, disease outbreaks, or species introductions (Jackson *et al*. 2001). The combined effect of all these impacts is to reduce the overall stability of marine ecosystems (Royal Commission on Environmental Pollution, 2004). It is often difficult to establish direct relationships between specific fisheries activities and ecological effects as many ecosystem properties and components that are affected directly or indirectly by fishing also show substantial natural variability. In addition, there are many gaps in our knowledge of marine ecological processes and so it is not always possible to establish clear links between ecological change and environmental or anthropogenic factors. Unlicensed commercial fishing is considered to be one of the most significant threats to marine biodiversity (Boyes *et al*. 2006)

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	However, the effect of this is currently unquantified due to lack of data on unlicensed activities of vessels under 11m. All types of fishing activity can take place in 'large shallow inlets and bays' (Sewell and Hiscock, 2005), and for the UK as a whole, it is likely that 'large shallow inlets and bays' are subject to all kinds of fishing activity. Some areas are also suitable for bait collection and aquaculture that can be a threat to sensitive eelgrass beds. Intertidal mudflats, sandflats, subtidal sandbanks and reefs are all constituent features of 'large shallow inlets and bays', and therefore they are subject to the same risks. Refer to the assessments for these constituent Annex I Features for descriptions of specific effects. **Anthropogenic disturbance and coastal development -** The development of the coastal area or construction of hard defences of any kind in the region of large shallow inlets and bays has the potential to greatly influence the feature. However, there is a presumption against coastal development in the UK which is described by the following documents (for Wales: TAN 14 Welsh Assembly 1998). Thus, future coastal development is not considered to be the most significant threat to 'large shallow inlets and bays'. With a number of notable exceptions, few major coastal construction projects are currently planned or in progress and those that are in the planning stages are required to provide mitigation for areas of habitat loss (Defra 2005). Barrage schemes for water storage, amenity, tidal power and flood defence continue to pose a threat to the integrity and ecological value of mudflats in estuaries and 'large shallow inlets and bays' (UKBAP 2006). However, future impact of development along the coast should not be downplayed as certain developments that require coastal locations are on the increase in some areas. **Coastal erosion and sea level rise -** It is accepted that global climate change will modify habitats and ecosystems worldwide, not least in the marine environment. Shoreline areas will be affected by

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	sea level rise and an increase in storms and winds resulting in changes to the distribution and composition of some shoreline habitats (Brooker and Young 2005). Sea level rise will also significantly impact the intertidal zone resulting in a decrease in area in some places. Changes in the length of growing and breeding seasons, community composition and species ranges are likely to continue (Brooker and Young 2005). Increasing temperatures can alter the timing of ecological processes and there is therefore potential for temporal mismatch between trophic levels. Generally, warm water species are likely to replace cold water species, with cold water species moving to more northerly latitudes or greater depths (Brooker and Young 2005). Patterns of species response to climate change are not straightforward, due to factors such as current flow, which may also change, and barriers to species movement. The positive effects of increased temperatures, for example increased primary productivity may be offset by the negative impacts of increased disturbance from wave and storm surge action (Brooker and Young 2005). There has already been a change in plankton species composition and abundance with a major shift in trends recorded in the early 1980s (Hays *et al*. 2005). This shift affects a large area of the North Atlantic and appears to be linked to changes in the North Atlantic Oscillation and climate (Hays *et al*. 2005). Uncertainties exist for many predictions including: species specific responses to climate change; the capacity of species from different habitats to migrate in response to a changing climate; the possible influx of new invasive species; the impact of increasing ocean acidity due to absorption of atmospheric CO2. In addition, changes in certain activities as a result of climate change, in particular those caused by sea level rise could also have an impact on the marine environment. For example, managed retreat to enable persistence of some coastal habitats might be inhibited by coastal development and construction of sea defences, whilst changes in fishing policy will substantially alter the pressure on the marine biodiversity resource. Sedimentary areas already protected by hard defences or bordered by developed land will suffer the greatest impact in the event of sea level rise (Boorman *et al*. 1989).

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	The combined effects of coastal erosion, sea level rise and the high cost of maintaining sea defences in areas such as the south-east are matters of concern. Erosive forces would become increasingly dominant and losses of fine sediment would lead to narrower intertidal within large shallow inlets and bays. Though more sheltered areas might initially experience increased deposition and extended areas of fine sediment and marsh, this process would cease once the sediment supply was reduced and ultimately erosion would dominate (Boorman *et al*. 1989). Therefore coastal development, coastal erosion and sea level rise and all considerable concerns in both hard and soft-sediment dominated large shallow inlets and bays. Although current anthropogenic activities such as future coastal development may be a threat, sea level rise will have the effect of squeezing the intertidal zone against existing developed land, which will ultimately reduce the intertidal area within 'large shallow inlets and bays'. Pye and French (1993) estimated that England alone would suffer losses of 8,000 – 10,000 ha of intertidal mud and sand flats (which can be components of 'large shallow inlets and bays') over twenty years (to 2013). However, data at present is insufficient to indicate to what extent the area of 'large shallow inlets and bays' is currently being reduced as a result of these threats. It is accepted that global climate change will modify habitats and ecosystems worldwide, not least in the marine environment. Shoreline areas will be affected by sea level rise and an increase in storms and winds resulting in changes to the distribution and composition of some shoreline habitats (Brooker and Second Young 2005). Sea level rise will also significantly impact the intertidal zone resulting in a decrease in area in some places. Changes in the length of growing and breeding seasons, community composition and species ranges are likely to continue (Brooker and Young 2005). Increasing temperatures can alter the timing of ecological processes and there is therefore potential for temporal mismatch between trophic levels. Generally, warm water species are likely to replace cold water species, with cold water

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	clear that NIS will continue to be transferred to UK waters for the foreseeable future. There is some legislation currently in place to reduce the introduction of NIS via Ballast Water through the International Maritime Organization (International Maritime Organization, 2004). This legislation aims to limit the number of viable organisms within ballast tanks in the future, but NIS remain a grave concern, and could potentially lead to habitat alteration and biodiversity loss within marine Annex I habitat features. Our ability to predict invasions is severely limited by the complexity of the invasion process itself, and therefore it is difficult to identify those marine Annex I features that are at greatest risk. Nonetheless, certain areas are known to be at a particularly high risk: (i) Areas within the vicinity of ports. Because the marine environment is essentially an open system, there is also potential for rapid and widespread secondary transfer of NIS within the UK once species establish reproducing populations (ii) Areas with a high diversity of habitat types (including diversity of substrate, salinity and temperature regimes and exposure). These habitats are most likely to be successfully invaded because, as the number of habitat types increases, so does the chance that a particular species will locate a suitable habitat for its establishment (iii) Areas already altered or damaged by anthropogenic effects (iv) Areas that have already been invaded by high numbers of NIS (v) Areas of low indigenous species richness. Brackish water conditions, for example, such as those found in estuaries generally support low diversity For ‘large shallow inlets and bays’, it is unlikely that we will be able to accurately predict which species will arrive, establish or what their impacts might be on native communities in the future. Though impacts can be minimal, they can also include massive population growth and subsequent displacement of native species with potential knock on effects on community assemblages/food webs etc.

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	Wasting disease of eelgrass beds - Wasting disease, which affects eelgrass (Zostera marina) beds is a significant threat to 'large shallow inlets and bays'. The disease causes eelgrass to die away over time, the leaves detaching from the main plant and the regenerative shoots decay. This disease appears to have occurred globally during the 1920s and 1930s and re-occurred in the 1980s (Butcher 1933; Giesen *et al*. 1990; Short *et al*. 1986). The causes of the disease are not fully understood, and theories range from sunshine deficiency, extremes of temperature to pathogenic causes such as protozoan, fungal or bacterial infection (Butcher 1941 and other references cited in Davison 1997); the cause has never been clearly established. It is known that the disease is still present, thus future epidemics seem likely and are of grave concern as die-offs of up to 90% of plants within a population have been reported (Whelan and Cullinane 1987). **Submerged or partially submerged sea caves** Main pressures are: Biocenotic evolution, Interspecific faunal relations, Interspecific floral relations, genetic pollution, Urbanised areas/human habitation, Industrial or commercial areas, Railway lines, port areas, sea defense or coast protection works, Trampling/overuse, Dumping/depositing of dredged deposits, Hunting, fishing or collecting activities not referred to above, Landfill, land reclamation and drying out/general, eutrophication, Discharges, Pollution, other forms or mixed forms of pollution, and water pollution. Major future threats are: Erosion, Submersion, collapse of terrain/landslide, invasion by a species, Interspecific faunal and floral relations, genetic pollution, Urbanised areas/human habitation, Industrial or commercial areas, Railway lines/TGV, port areas, Trampling/overuse, Dumping/depositing of dredged deposits, Hunting, fishing or collecting activities not referred to above, Landfill, land reclamation and drying out/general, eutrophication, Discharges, Pollution, other forms or mixed forms of pollution, and water pollution. **Non-Indigenous Species -** Non-indigenous species (NIS) present a significant threat to the marine

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	environment and their effects can have both economic and ecological ramifications, including biodiversity loss. The deleterious impacts of NIS have been shown across global regions, habitat types, and taxonomic groups worldwide. In marine ecosystems, ships' ballast water and fouled hulls are the primary mechanisms for the transport and introduction of non-indigenous marine species to ports worldwide (Cohen and Carlton 1998). Given the continued growth of global trade and the complexity of shipping patterns globally, it is clear that NIS will continue to be transferred to UK waters for the foreseeable future. There are some measures currently in process to reduce the introduction of NIS via Ballast Water through the International Maritime Organisation (International Maritime Organisation 2004). This legislation aims to limit the number of viable organisms within ballast tanks upon arrival in port. Though this will in theory reduce the risk of introduction via shipping, the techniques to reduce density are still in the research and development phase and therefore the effectiveness of this legislation in the long term remains to be seen. Due to this uncertainty, NIS remain a grave concern for Annex 1 features. Our capacity to predict invasions is severely limited by the complexity of the process, which is influenced by numerous factors associated with introduction, establishment and subsequent growth and range expansion of introduced species. Because of our limited predictive capacity in relation to NIS, it is difficult to identify those features that are at greatest risk, and thus we must consider all of them to be threatened to some degree by NIS (Ruiz *et al*. 1997; Cohen and Carlton 1998). **Coastal development -** There is a presumption against coastal development in as described by the following planning policy documents for Wales – (TAN 14 - Welsh Assembly Government 1998). **Other physical impacts -** Partially submerged (i.e. intertidal) caves, especially on chalk shores are susceptible to human disturbance especially by trampling, stone-turning and damage to rocks through removal of piddocks (UKBAP 2006). Chalk, especially the soft type found in Kent, is more likely to fragment and collapse than other rocks (except clay) because it is relatively easily eroded by rock-boring animals, wave action and tidal streams carrying sand and stones. These are natural

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	processes, but damage could also be inflicted by physical disturbances (George *et al*. unpublished). Caves are generally unsuitable areas for fishing and are therefore unlikely to be damaged or deteriorate as a direct result of fishing activity. However, an indirect impact from fishing litter, if washed into caves, could cause abrasion of epifauna and a possible tangle hazard for mobile species (Sewell and Hiscock 2005). Sewell and Hiscock (2005) found no references on the effects of fishing activity on caves. Sessile organisms colonising sublittoral sites at the eastern end of the English Channel already have to contend with fairly high levels of siltation but may be vulnerable to increases in turbidity and levels of sedimentation from fishing, aggregate extraction and spoil dumping (Centre for Environment, Fisheries and Aquaculture Science (CEFAS) 2001). **Water Quality -** The deterioration of water quality by pollutants and nutrients has caused the replacement of fucoid dominated biotopes by mussel-dominated biotopes, and the occurrence of nuisance *Enteromorpha spp*. blooms (UKBAP 2006).
Landowner/ Management Responsibility	• CCW/Isle of Anglesey
HRA/AA Studies undertaken that address this site	HRA and AA of the Wales Spatial Plan Update (WSPU) National and Area Frameworks, Welsh Assembly Government (June 2008, C4S) The HRA screening process concluded that it was not possible to confirm that the WSPU, alone or in combination with other plans or projects, would not have a significant effect on European and international sites in Wales, its offshore waters and across the border in England. An Appropriate Assessment was therefore undertaken together with a further HRA carried out in greater detail in relation to the lower tier plans, action plans, and programmes which enable the delivery of the Welsh Spatial Plan. As a result of the proposed avoidance and mitigation action which was been identified, it was

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	concluded that the Wales Spatial Plan 2008 Update will not adversely affect the integrity of European and international sites, either alone or in combination with other plans or projects. The AA found that key actions associated with the WSPU and in-combination effects with other plans and projects that may affect European sites are: urban and economic development activities; water abstraction and water pollution; recreation and tourist pressures; provision of energy and transport infrastructure.

Site Name: Eryri/ Snowdonia

- **Location: 53 10 24 N/03 57 12 W**
- **SAC EU Code: UK0012946**
- **Size: 19737.6 ha**
- **Designation: SAC**

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Site Description	Snowdonia National Park covers 823 square miles of the most beautiful and unspoilt countryside in North Wales. It is an area where people live and work but also where thousands come to relax and enjoy a wide range of leisure activities. (http://www.snowdonia-npa.gov.uk/page/index.php?nav1=home&nav2=1&nav3=1&lang=eng&view=graphic) General site character Inland water bodies (standing water, running water) (2%) Bogs. Marshes. Water fringed vegetation. Fens (15%) Heath. Scrub. Maquis and garrigue. Phygrana (19.7%) Dry grassland. Steppes (34%) Alpine and sub-alpine grassland (1%) Broad-leaved deciduous woodland (0.3%) Inland rocks. Screes. Sands. Permanent snow and ice (27%) Other land (including towns, villages, roads, waste places, mines, industrial sites) (1%) (JNCC)
Qualifying Features	***Annex I habitats that are a primary reason for selection of this site:*** **3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*** Llyn Idwal, in the mountains of Snowdonia, represents oligotrophic waters (Type 3) in north Wales.

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	It is a relatively small, shallow, upland corrie, in contrast to Llyn Cwellyn, also in Snowdonia, and complete ice cover has been recorded in winter. No overall change in the lake's water chemistry has been found since the mid-19th century, and the water quality is considered to be high. The site has a good representation of typical plant species, including quillwort *Isoetes lacustris*, water lobelia *Lobelia dortmanna*, shoreweed *Littorella uniflora*, bulbous rush *Juncus bulbosus*, alternate water-milfoil *Myriophyllum alterniflorum* and intermediate water-starwort *Callitriche hamulata*. Bog pondweed *Potamogeton polygonifolius* has been recorded from stream inlets, and pillwort *Pilularia globulifera* is reported from this site. Emergent and floating vegetation is mainly confined to the shallow sub-basin at the south end of the site, where floating bur-reed *Sparganium angustifolium* forms extensive mats, alongside stands of common reed *Phragmites australis*, water horsetail *Equisetum fluviatile* and bottle sedge *Carex rostrata*. **6150 Siliceous alpine and boreal grasslands** Snowdonia has the best-developed and most extensive areas of **Siliceous alpine and boreal grasslands** in Wales and is the largest example of the habitat type south of Scotland. The principal sub-type present is U10 *Carex bigelowii – Racomitrium lanuginosum* moss-heath, but there are also fragments of U7 *Nardus stricta – Carex bigelowii* grass-heath. This site is representative of the more impoverished southern variants of the habitat type. **6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels** Snowdonia is the most southerly site selected and contains the most extensive and diverse examples of **hydrophilous tall herb fringe communities** in Wales. Fragmentary stands of the habitat type occur on pumice tuff and other base-enriched igneous rocks at a range of altitudes throughout the site. The vegetation is floristically somewhat impoverished compared with Scottish examples but includes many of the species found further north, such as globe-flower *Trollius europaeus*, wild angelica *Angelica sylvestris* and holly-fern *Polystichum lonchitis*. It is important as a southern outlier for arctic-alpines such as alpine saw-wort *Saussurea alpina* and black alpine-sedge *Carex atrata*. There are also some southern species, which are absent further north, for

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	example Welsh poppy *Meconopsis cambrica*. **8110 Siliceous scree of the montane to snow levels (*Androsacetalia alpinae* and *Galeopsietalia ladani*)** Snowdonia is the largest site in Wales representative of **siliceous scree**. The site has extensive screes of igneous rocks with large stands of U21 *Cryptogramma crispa – Deschampsia flexuosa* vegetation; associated species include fir clubmoss *Huperzia selago*. Bryophyte and lichen-dominated screes are also well-represented and include important populations of rare and local montane and oceanic species, such as *Marsupella adusta*, *Marsupella stableri* and *Cornicularia narmoerica*. **8210 Calcareous rocky slopes with chasmophytic vegetation** Snowdonia is representative of **Calcareous rocky slopes with chasmophytic vegetation** at one of its most southerly outposts in the UK, and contains the most extensive and diverse examples of these communities in Wales. Crevices in base-rich igneous rocks support a characteristic assemblage of plants, with a large number of arctic-alpine species. These include a number of nationally rare species, such as alpine saxifrage *Saxifraga nivalis*, tufted saxifrage *S. cespitosa*, alpine meadow-grass *Poa alpina* and alpine woodsia *Woodsia alpina*. A species of particular interest is the Snowdon lily *Lloydia serotina*, which in the UK occurs only in Snowdonia, in rock cracks and crevices on calcareous and more siliceous substrates, and is here at its northern limit in western Europe. **8220 Siliceous rocky slopes with chasmophytic vegetation** Snowdonia, north Wales, is representative of **Siliceous rocky slopes with chasmophytic vegetation** at the southern edge of the range of the habitat type. Acidic crevice communities occur throughout the site on igneous outcrops and include populations of stiff sedge *Carex bigelowii*, fir clubmoss *Huperzia selago* and forked spleenwort *Asplenium septentrionale*. Atlantic species,

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	including Wilson's filmy-fern *Hymenophyllum wilsonii* and a wide range of bryophytes, are also well-represented. ***Annex II species that are a primary reason for selection of this site:*** **1393 Slender green feather-moss *Drepanocladus* (*Hamatocaulis*) *vernicosus*** This is an upland site in north Wales for **Slender green feather-moss *Drepanocladus vernicosus***, which has been recorded in flushes up to an altitude of 450 m. **1831 Floating water-plantain *Luronium natans*** Snowdonia in north Wales is an example of a montane lake habitat supporting **floating water-plantain *Luronium natans***. Records date back to the 18th century, indicating that habitat conditions are particularly favourable for this species.
Conservation Objectives	**Siliceous alpine and boreal grasslands (EU Habitat Code: 6150)** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The high summits of the Carneddau (Carnedd Dafydd, Pen yr Ole Wen, Carnedd Llewelyn, Garnedd Uchaf, Yr Aryg, Foel Grach, Llwytmor, Drosgl, Foel Fras, Pen Llythrig y Wrach and Pen yr Helgi Ddu) the Glyderau (Y Garn, Glyder Fach, Glyder Fawr, Elidir Fach, Carnedd y Ffiliast and Mynydd Perfedd), should each support summit heath vegetation which does not show signs of heavy modification by grazing and/or heavy trampling. • There should be no further loss of summit heath on Yr Wyddfa. The extent of the habitat at Crib y Ddysgl and Garnedd Uchaf should be retained as an absolute minimum and there should be no loss of quality. • The vegetation should be dominated by species typical of species of summit heath such as

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	Racomitrium lanuginosum (woolly hair moss), *Carex bigelowii* (stiff sedge), shrubs dwarfed by the high altitude conditions such as *Vaccinium myrtillus* (bilberry) and *Salix herbacea*, lichens and montane bryophytes. • Grasses should not comprise a significant proportion of the vegetation. • The habitat should grade into montane heath at its lower level. • All factors affecting the achievement of these conditions are under control. **Hydrophilous tall herb communities of plains and of the montane to alpine levels (EU Habitat Code: 6430)** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The area of tall herb ledge must be stable, or increasing in the long term. There will be no loss of tall herb ledge vegetation and the feature will occur in all management units in which it currently occurs • Tall herb ledge vegetation will develop on ledges and on damp calcareous grassland below cliffs where the potential exists but expansion is currently prevented by grazing. • Tall herb vegetation will consist of a number of flowering plant species such as Lady's mantle *Alchemilla spp.,* Meadowsweet *Filipendula vulgaris,* Globeflower *Trollius europaeus,* Welsh poppy *Meconopsis cambrica,* Devilsbit scabious *Succisa pratensis,* Ox-eye daisy *Leucanthemum vulgare,* Wild Angelica *Angelica sylvestris,* Roseroot *Sedum rosea,* Lesser meadow rue *Thalictrum minus* and Common valerian *Valeriana officinalis* • The flowering plants will be ungrazed and able to mature and set seed freely **Calcareous rocky slopes with chasmophytic vegetation (EU Habitat Code: 8210)** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The feature must be stable or increasing in the long term. There will be no loss of calcareous chasmophytic vegetation and it will continue to occur in all of management units in which it currently

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	occurs. • The feature must continue to support a range of arctic alpine plant populations. • The plants will be ungrazed and able to mature and set seed freely, or non-flowering plants reproduce by propagules or vegetative means. • The feature will not be inhibited by invasive non-native plant species. **Siliceous rocky slopes with chasmophytic vegetation (EU Habitat Code: 8220)** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • This habitat should support a range of bryophytes and ferns in suitable crevices on acid rocks. • The feature should not be damaged by grazing. • It should be widespread on suitable moist acidic rock crevices on each massif . **Siliceous scree of the montane to snow levels (EU Habitat Code: 8110)** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The naturally mobile scree on each massif will have open vegetation on or among the boulders, with *Cryptogramma crispa, Deschampsia flexuosa, Festuca ovina, Galium saxatile, Huperzia selago* and an extensive and varied bryophyte flora. • There will not be excessive disturbance to the as a result of human or animal activity. **Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* (EU Habitat Code: 3130)** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • Each of the lakes has a macrophyte flora which includes some of the characteristic species such as *Littorella uniflora, Lobelia dortmanna, Isoetes lacustris, Myriophorum alterniflorum, Juncus bulbosus, Potamogeton* species and *Subularia aquatica*

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	• The lakes which have not been dammed for use as reservoirs retain a natural profile. • All of the lakes show a characteristic vegetation zonation from the shore to the deeper water. • Water quality of each lake is within parameters which are suitable to support the characteristic flora and fauna **Floating water plantain *Luronium natans* (EU Habitat Code: 1831)** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • *Luronium natans* occurs in Llyn Cwmffynnon as a minimum **Slender green feather-moss *Drepanocladus (Hamatocaulis) vernicosus* (EU Habitat Code: 1393)** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The moss is present at Cwm Afon Llafar Flush A and Flush B. • The associated vegetation should be dominated by rushes and sedges, with <20% rush cover. • There should be less than 10% disturbed bare ground within the flushes.
Component SSSIs	Eryri SSSI – This is the total area covered by this plan and includes areas of geological interest only which fall outside the SAC boundary
Key Environmental Conditions (factors that maintain site integrity)	**Siliceous alpine and boreal grasslands (EU Habitat Code: 6150):** Summit heath does not require grazing for its maintenance and it needs a long period of no grazing for its recovery. At the present time sheep and ponies (on the Carneddau) are free to wander on the mountain summits. Furthermore, sheep tend to favour the well-drained mountain tops over the wet peaty habitats below. Shepherding is possible and is a component of several existing management agreements where the holdings contain, or are contiguous with, areas of montane and summit

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	heath. This option needs further development and support. However it is difficult to monitor the success of this and it could never be totally successful in keeping stock off the summits. This would only be successful if there were further reduction in grazing pressure across the unenclosed mountain blocks, as a whole. Fencing out the summit vegetation would be highly controversial, mainly because the upland commons have been managed for centuries without fences and neither the farmers, landowners, the National Park Authority nor ramblers currently welcome the suggestion. Moreover erection of fencing on open land and registered common land would present considerable legal problems and would probably not be sustainable. Many of the summits and ridges are very popular with walkers and although most will keep to paths, there is the risk of impacts on the vegetation as a result of people wandering over the habitat and also the widening of paths as a result of increased trampling from large numbers of people. This factor is not within the control of any single organisation but there is a presumption against giving consent to new races or other recreational events involving significant numbers of participants, who utilise the ridges and summits. **Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (EU code 6430):** The habitat is restricted to ledges with sufficiently moist and base-enriched soils to support this vegetation. Furthermore, the habitat has been restricted by grazing sheep to ledges that are relatively inaccessible. There are many ledges which support the habitat in a degraded state where all of the characteristic plants are grazed almost to soil level and cannot flower and set seed. Feral goats have exacerbated the problem because they are very agile and can reach areas where the sheep cannot reach and it is impossible to exclude them from the ledges. They are a major problem at Cwm Idwal. For the plant populations of this habitat to recover and expand it is essential that grazing by sheep and goats is removed. Grazing control difficult to achieve since there are no barriers to stock. Shepherding is possible but it is difficult to monitor success. Goats can only be controlled by culling.

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	Calcareous rocky slopes with chasmophytic vegetation (EU code 8210): For the plant populations of this habitat to recover and expand it is essential that grazing by sheep and goats is removed. However, grazing control is difficult to achieve since there are no barriers to stock which graze the lower altitudes. Shepherding is possible but it is difficult to monitor success. Goats can access rocky areas which are inaccessible to sheep and can only be controlled by culling. The habitat supports rare arctic alpine plants at the southern limit of their range which are vulnerable to potential warming with climate change. These populations must be given every opportunity to thrive and expand if they are to have any chance of buffering the effects of such changes. We have no means of controlling the non-native species *Epilobium brunnescens* and may in the future need to revise our conservation objectives in respect of this plant. **Siliceous rocky slopes with chasmophytic vegetation (EU code 8220):** In various locations the habitat is may be subject to overgrazing by sheep and goats. Localised inappropriate recreational pressure can also cause problems. Better definition and further survey of this habitat is needed to allow effective monitoring and reporting and to effectively target its conservation. However in practice the grazing management for this habitat will mostly be a consequence of management for other more sensitive montane features. **Siliceous scree of the montane to snow levels (EU Habitat Code:8110):** Scree is naturally an unstable habitat, but in various locations in Eryri scree slopes are additionally unstabilised by overgrazing by sheep of adjacent land and localised inappropriate recreational pressure**,** leading to increased scree mobility and visible tracks through the habitat. Careful consideration of access routes and grazing pressure in the habitat is required. The habitat can support some grazing at relatively low levels, as this helps to reduce overgrowth by scrub and bracken. However, there will be places in Eryri where the management for other features (woodland, scrub and heath for example) will result in areas of more stable scree being overgrown by trees and heath. This is acceptable as long as the main areas of higher altitude scree are maintained in good condition.

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	Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* (EU Habitat Code: 3130): The use of lakes within the SAC for angling is very limited. Some of these lakes are also used as drinking water reservoirs. It is crucial that sudden changes in water level are avoided in addition to the introduction of fish stock. Note, not all of the water bodies within the SAC are classified as this feature. Reduction in the amount of nutrient input from sheep droppings as a result of grazing reductions for other habitats should benefit the naturally oligotrophic lakes. **Floating water plantain *Luronium natans* (EU Habitat Code: 1831):** A comprehensive survey for this species is required. **Slender green feathermoss *Drepanocladus (Hamatocaulis) vernicosus* (EU Habitat Code: 1393):** Little is known about the population dynamics or the ecological requirements of this bryophyte. Because of the scale of the habitat in which this moss occurs i.e. scattered in flushes) it may be vulnerable to excessive livestock trampling. However the known population is located on Llanllechid Common, an area which has very high levels of sheep grazing. It is unlikely that reduction in grazing levels would be detrimental to this feature but only further study could ascertain its management needs. It is unlikely that management could be targeted specifically at this species on this large open common land.
SPC Condition Assessment	**Siliceous alpine and boreal grasslands (EU Habitat Code: 6150):** Status 2007 – unfavourable declining. Dwarf shrubs are very low in cover, *Racomitrium* has declined and grass cover is too high. Restoration of this habitat is a very long term objective. **Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels (EU**

	Eryri/Snowdonia SAC
	code 6430): This habitat is unfavourable because many of the ledges are being grazed by sheep and feral goats. The habitat was monitored at key locations, Cwm Idwal and Clogwyn y Garnedd by CCW in 1998 and found to be unfavourable. Further monitoring by CCW in 2003 at Cwm Idwal was less intensive than the former round because it was evident that much of the habitat was grazed and therefore unfavourable. **Calcareous rocky slopes with chasmophytic vegetation (EU code 8210):** The habitat is currently unfavourable because some of it is grazed and also because a non-native species is present. Monitoring of the calcareous rocky slopes with chasmophytic vegetation was undertaken during October 2005 and June 2006 and the monitoring sampled the calcareous chasmophytic vegetation at four locations (Ysgolion Duon, Cwm Idwal, Clogwyn y Garnedd and Cwm Glas). Cwm Glas was the only location, which fulfilled the criteria for "good quality" habitat set out in the performance indicators. The other locations failed due to the presence of non-native species (i.e. *Epilobium brunnescens*) and because the chasmophytic vegetation was showing signs of detrimental browsing from sheep and goats. **Siliceous rocky slopes with chasmophytic vegetation (EU code 8220): Conservation Status of Feature 6** The habitat is reported as unfavourable/ unclassified. It is a habitat which is not well defined in the NVC or in the Annex 1 habitats. This makes identification and conservation measures difficult as very large areas of Eryri could conceivably be classified under this heading. **Siliceous scree of the montane to snow levels (EU Habitat Code:8110):** The habitat was reported as unfavourable in 2006 because of excessive disturbance by sheep, goats and humans. **Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea* (EU Habitat Code: 3130):** The habitat is reported as unfavourable/ recovering

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	Floating water plantain *Luronium natans* (EU Habitat Code: 1831): This feature has not been fully assessed. It is still unclear which lakes contain this species because it can be a very difficult species to locate in deep water. The only records are from Llyn Idwal in the early 20th century, and more recently from Llyn Cwmffynnon. Survey has failed to relocate it from Llyn Idwal in recent years and a survey of Llyn Cwm Ffynnon in September 2006 was inconclusive. It is possibly present in some of the other Eryri lakes where conditions appear to be suitable. **Slender green feathermoss *Drepanocladus (Hamatocaulis) vernicosus* (EU Habitat Code: 1393):** This feature is recorded as favourable/ maintained.
Vulnerabilities (includes existing pressures and trends)	The area is extensively grazed by sheep. In many areas, ecological overgrazing takes place, ericaceous species are being suppressed, grass species are dominating and montane communities such as moss heath are being damaged and reduced in area. Resolution of this problem is complex, due to the breakdown of traditional shepherding, other changes in livestock management on these open mountain areas, and the economics of upland farming. This is being actively tackled by the Countryside Council for Wales (CCW) by the negotiation of management agreements. Snowdonia, which contains the highest peaks in Wales, has long been used for rock-climbing and fellwalking. It is subject to intense recreational pressures and where these are concentrated, particularly on paths and summit areas, there are severe erosion problems, despite management. However, these rarely impinge upon the special features of the area. Remedial work by Snowdonia National Park Authority, National Trust and CCW is tackling this problem. The high rainfall and extensive acidic geology/pedology renders this area, especially its watercourses and lakes, vulnerable to acidification. Sections of the site (Cwm Crafnant, Cwm Idwal and Yr Wyddfa) are managed as National Nature Reserves and are covered by CCW management plans.
Landowner/ Management Responsibility	Cyngor Gwynedd Council Cyngor Bwrdeistref Sirol Conwy/ Conwy County Borough Council

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HRA/AA Studies undertaken that address this site	Not known

Site Name: Abermenai to Aberffraw Dunes SAC

- **Location: 53 09 06 N/ 04 22 22 W**
- **SAC EU Code: UK0020021**
- **Size: 1871.03 ha**
- **Designation: SAC**

	Abermenai to Aberffraw Dunes SAC
Site Description	Coastal sand dunes. Sand beaches. Machair (55%) Shingle. Sea cliffs. Islets (2.9%) Inland water bodies (standing water, running water) (2.6%) Bogs. Marshes. Water fringed vegetation. Fens (0.3%) Heath. Scrub. Maquis and garrigue. Phygrana (1.4%) Coniferous woodland (37.8%)
Qualifying Features	***Annex I habitats that are a primary reason for selection of this site:*** **2110 Embryonic shifting dunes** Abermenai to Aberffraw Dunes is one of two sites selected to represent Embryonic shifting dunes in north Wales. Embryonic dunes form a zone across a broad part of the beach/dune interface, making this site one of the most extensive examples of this habitat type in the UK. It is a site where, in contrast to some others in north Wales, recreational damage is minimal. **2120 Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`)** Abermenai to Aberffraw Dunes is one of two sites selected in north Wales. It contains one of the largest areas of lyme-grass *Leymus arenarius* shifting dune community in Wales. The mobile dunes at the southern end of the site support an abundance of sea-holly *Eryngium maritimum*, and there is well-developed zonation of dune types, including both seaward transitions between mobile dune and foredune, and landward transitions to fixed dune and dune slack.

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	2130 Fixed dunes with herbaceous vegetation (`grey dunes`) * Priority feature Within this dune complex in north Wales are extensive areas of both fixed dune vegetation with red fescue *Festuca rubra* and lady's bedstraw *Galium verum* and semi-fixed dune grassland with marram *Ammophila arenaria* and red fescue. Despite the fact that a large proportion of the open vegetation has been afforested, the remaining communities retain considerable interest. Notable species of the site include early sand-grass *Mibora minima*. On the south side of Menai Strait, the dunes at Morfa Dinlle include a lichen-rich community with *Coelocaulon aculeatum* (SD11), a type of vegetation which is very rare in Wales. **2170 Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*)** Abermenai to Aberffraw Dunes in north Wales comprises an extensive area of dunes with a complete range of dune vegetation, including substantial areas of slack vegetation dominated by creeping willow *Salix repens* ssp. *argentea*. Despite the extent of afforestation, the dune aquifer retains its overall integrity, although changes in water table, partly attributable to the growth of the forest, have influenced the development of the dune slacks. There is long-term potential for further improvement. **2190 Humid dune slacks** Abermenai to Aberffraw Dunes represents **Humid dune slacks** in north Wales. There are large areas of open dune vegetation and many **Humid dune slacks** remain, although there have been changes in the water table that are partly attributable to the growth of the commercial forest. The changes have influenced the development of humid dune slacks, which nonetheless retain most the essential features of the habitat type. ***Annex II species that are a primary reason for selection of this site:*** **1395 Petalwort *Petalophyllum ralfsii*** Abermenai to Aberffraw Dunes is an extensive complex of sand dunes, dune slacks, marsh, shingle

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	and cliffs in south-west Anglesey, north Wales. There is a large population of **petalwort *Petalophyllum ralfsii*** here that was first recorded in 1828. This historical continuity indicates that the site is especially favourable for the survival of this species. Although partly afforested, the open dunes have a very rich bryophyte flora, including the mosses *Amblyodon dealbatus*, *Catoscopium nigritum* and the liverwort *Southbya tophacea*, particularly in damp, calcareous slacks and flats. **1441 Shore dock *Rumex rupestris*** Abermenai to Aberffraw Dunes in north Wales is important as it represents **shore dock *Rumex rupestris*** at the far north-west of its geographical range. It is remote from other known sites for this species, and shore dock occurs in an unusual situation: along a small stream bed and on damp pond edges, formerly in duneland, now in a clearing in a conifer plantation. There are two small colonies, which held 21 flowering plants in 1994, 26 in 1995 and 53 in 1996.
Conservation Objectives	**Embryonic shifting dunes (EU Ref: 2110**): The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The distribution and extent of embryonic shifting dunes in late summer is determined by the availability of naturally accreting sand and strand line organic material. However, we would not expect all this potential embryonic dune habitat area to be vegetated in any one year and embryonic dunes may be absent in some years. Continuous absence over the six-year reporting cycle would cause the condition to be considered unfavourable. • The potential for the embryonic shifting dunes element of the typical zonation, from beach to fixed dune, is intact along the soft coastal frontage. This includes an unrestricted supply of sediment, opportunity for aeolian transport and naturally occurring organic strandline material. • The typical species of the strandline vegetation include *Atriplex spp., Beta vulgaris, Cakile maritime, Honkenya peploides, Salsola kali.* • The typical species of the embryonic dune vegetation include *Elytrigia juncea* and /or *Leymus*

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	arenarius. • All factors affecting the achievement of these conditions are under control. **Shifting dunes along the shoreline with *Ammophila arenaria* ("white dunes") (2120):** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • Shifting dunes with *Ammophila arenaria* are present along the dune front facing prevailing (southwest) winds where sediment supply is adequate. • There should be no decrease in the total (aggregate) area of qualifying dune habitats for which this site was designated (i.e., the sum total of qualifying dune habitat should not diminish). The extent and location of individual dune habitat features may be subject to periodic and seasonal variation. • The shifting dunes element of the typical zonation from beach to fixed dune is intact along the soft coastal frontage. • Bare ground is present. • The typical species of the shifting dune vegetation include *Ammophila arenaria, Leymus arenarius, Elymus farctus, Eryngium maritimum, Euphorbia portlandica, Euphorbia paralias*, and *Calystegia soldanella*. • All factors affecting the achievement of these conditions are under control. **Fixed dunes with herbaceous vegetation (`grey dunes`)* (Habitats Directive priority feature) (2130):** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The distribution of fixed dunes within the site may vary in response to natural dynamic processes and changes to other qualifying dune habitats for the site. • There should be no decrease in the total area of fixed dunes with herbaceous vegetation. • The fixed dunes element of the typical zonation from beach to fixed dune is intact along the soft coastal frontage.

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	• Bare ground is present • The typical species of the fixed dune vegetation include *Cerastium fontanum, Crepis capillaris, Cladonia spp., Peltigera spp., Erodium cicutarium, Geranium molle, Luzula campestris, Odontites verna, Pilosella officinarum, Plantago lanceolata, Prunella vulgaris, Festuca rubra, Galium verum, Anacamptis pyramidalis, Thymus polytrichus, Sedum acre, Veronica chamaedrys, Carex arenaria, C. flacca, Euphrasia officinalis, Hypnum cupressiforme, Hypochaeris radicata, Linum catharticum, Lotus corniculatus, Ononis repens, Rhinanthus minor, Rhytidiadelphus squarrosus, R triquetrus, Tortula muralis Viola canina, V. riviniana* and *V. tricolor.* • All factors affecting the achievement of these conditions are under control. **Dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*) (2170):** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The distribution of dunes with *Salix repens ssp argentea* is consistent with the typical dune zonation and where topographic conditions are suitable. The location of dunes with *Salix repens ssp argentea* within the site may vary in response to natural dynamic processes and changes to other qualifying dune habitats for the site • There should be no decrease in the total (aggregate) area of qualifying dune habitats for which this site was designated (i.e., the sum total of qualifying dune habitat should not diminish). The extent of individual dune habitat features may be subject to periodic and seasonal variation. • Salix repens is at least frequent and generally 5 - 30cm tall. • Opportunities for the initiation of embryonic dune slacks by wind erosion exist. • Bare ground is present. • The groundwater level is appropriate in winter and summer. • Groundwater quality is unaffected by pollution. • The typical species include *Salix repens, Carex arenaria, C flacca, Euphrasia officinalis, Festuca rubra, Lotus corniculatus, Ononis repens, Equisetum variegatum, Epipactis palustris, Epipactis leptochila spp dunensis* and *Pilosella officinarum.*

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	• All factors affecting the achievement of these conditions are under control. **Humid dune slacks (2190):** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The distribution of humid dune slacks is consistent with the typical dune zonation and where topographical conditions are suitable. The location of humid dune slacks within the site may vary in response to natural dynamic processes and changes to other qualifying dune habitats for the site. • There should be no decrease in the total (aggregate) area of qualifying dune habitats for which this site was designated (i.e., the sum total of qualifying dune habitat should not diminish).The extent and location of individual dune habitat features may be subject to periodic and seasonal variation. • All humid dune slack communities should be present, from embryonic dune slacks with a high % of bare ground to more closed vegetation with Salix repens. • Opportunities for the initiation of embryonic dune slacks (by wind erosion) exist. • Bare ground is present. • The ground water level is appropriate in winter and summer. • Ground water quality is unaffected by pollution. • The typical species include *Salix repens, Carex arenaria, C flacca, Equisetum variegatum, Lotus corniculatus, Ononis repens, Potentilla anserina, Galium palustre, Mentha aquatica, Hydrocotyle vulgaris*, *Campyllium stellatum, Prunella vulgaris, Ranunculus flammula, Calliergon cuspidatum, Anagallis tenella. Parnassia palustris, Selaginalla selaginoides,* *Dactylorhiza incarnata* and *Epipactis palustris.* • Petalwort occurs in humid dune slacks in which *Equisetum variegatum* is frequent at Aberffraw and Newborough compartments. • All factors affecting the achievement of these conditions are under control. **Petalwort *Petallophyllum ralfsii (1395):*** The vision for this feature is for it to be in a favourable conservation status, where all of the following

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	conditions are satisfied: • The population of petalwort is stable or increasing. • Petalwort occurs in humid dune slacks in which *Equisetum variegatum* is frequent, across all sectors of the site where habitat conditions are suitable, i.e. Aberffraw and Newborough compartments. • Humid dune slack with bare sand or humus crust and short vegetation characterised by *Equisetum variegatum* is present at Aberffraw and Newborough compartments where sediment and hydrological conditions permit. (see Objective for humid dune slacks). • Competition (including shading) from other species is controlled. • All factors affecting the achievement of these conditions are under control. **Shore dock *Rumex rupestris (1441):*** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The population of shore dock is stable or increasing. • Shore dock occurs in at least 3 locations across the site. • Opportunities occur for marine dispersal of seed. • Open streamside, coastal soft cliff seepages or dune slack pool habitat is adequate for its survival. • Adequate freshwater supply is maintained. • Bare ground or disturbed areas are maintained (for example by grazing animals) to permit germination. • Competition (including shading) from other species is controlled. • All factors affecting the achievement of these conditions are under control.
Component SSSIs	Tywyn Aberffraw SSSI Morfa Dinlle SSSI Newborough Warren – Ynys Llanddwyn SSSI

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Key Environmental Conditions (factors that maintain site integrity)	**Embryonic shifting dunes (2110)** Embryonic shifting dunes are ephemeral features, often removed in winter storms and re-forming in varying locations and amounts in the summer. Management requirements include the retention of a natural organic strandline and the avoidance of, for example mechanical beach cleaning which has become a problem elsewhere or artificial dune defences which may encourage beach scouring and alteration of the sediment supply. Heavy recreational trampling can also damage the feature and this is apparent on small sections of Llanddwyn beach but is generally within tolerable limits. The main action required to restore the feature to favourable conservation status is the restoration of the natural zonation to fixed dune grassland. Removal of confer plantation near the shore and its restoration to mobile dune and fixed dune grassland is necessary. Discussion has been underway with the Forestry Commission (since 2000) for this under the Forest Design Plan process. **Shifting dunes along the shoreline with Ammophila arenaria (2120):** Shifting dunes require a regular sand supply and the opportunity for mobility – both wind erosion and periods of marine erosion can occur naturally. Mobile dunes are very resilient to disturbance if permitted to recover naturally. Problems may occur where persistent recreational access is concentrated (for example at car parks or access points) where special measures or structures may be required to facilitate recovery. The main action required to restore the feature to favourable conservation status is the restoration of the natural zonation to fixed dune grassland. Removal of conifer plantation near the shore and its restoration to mobile dune and fixed dune grassland is necessary. Discussion has been underway with the Forestry Commission (since 2000) for this under the Forest Design Plan process. **Fixed dunes with herbaceous vegetation (“grey dunes”) (2130):** The fixed dunes with herbaceous vegetation (“grey dunes”) require light grazing to maintain open conditions. There is a dynamic relationship between large herbivores (currently sheep, cattle and

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	ponies) and small grazers, notably rabbits. Large herbivores remove the coarse vegetation and enable rabbits to thrive on the short turf. The restoration of livestock grazing to Newborough dunes from 1986 onwards has been instrumental in restoring the condition of much of this feature from its former coarse grass dominated state. This site has accordingly become a demonstration areas for dune conservation management throughout the UK. However, levels of livestock grazing declined on Tywyn Aberfraw and a dense grass thatch has developed in parts since 2000. Recent restoration of cattle grazing is expected to improve the situation. Levels of grazing on Morfa Dinlle should be reviewed to ascertain whether there is long-term decline in commensal rabbit grazing. **Dunes with *Salix repens* ssp *argentea* (*Salicion arenariae*) (2170):** Continuation of grazing management is required, particularly where the development of scrub and rank grassland is apparent, for instance on Tywyn Aberffraw where a period of abandonment of the grazing regime may be partly responsible for an increase in scrub on the site. Restored water table (see feature 5) should also assist the management of this feature in its correct representation in the zonation and succession of the dune systems. **Humid dune slacks (2190):** The humid dune slacks require high water levels – notably standing surface water in winter and groundwater within 1m of the surface during the summer. Variation in rainfall and climate change notwithstanding, there have been a number of past management actions which have directly or indirectly lowered the groundwater table. Where ditching and river deepening has affected the water table, this should be rectified by appropriate action which may include ditch blocking, river bed realignment etc. Where afforestation has led to increased evapotranspiration and interception of rainwater, resulting in a lowered water table, woodland management (including clearance) should seek to maximise the water yield. Continuation of grazing management is also required. **Petalwort (1395):**

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	At Aberffraw, the maintenance of grazing to maintain open dune conditions and low sward, preventing scrub-induced increases in evapotranspiration and consequential lowering of water tables. The presence of several drains and over-deepened river channels should be reviewed with regard to groundwater levels. The quality of groundwater must be protected from direct or indirect pollution. At Newborough, drains within the forest (north to the Cefni) militate against the survival of this species in remnant open slacks. Consideration should be given to their infilling. Drying of the slacks elsewhere should be addressed. **Shore dock (1441):** The entire feature occurs within the Newborough Forest (management unit 20). Management requirements include maintenance of open conditions, scarification or poaching of the ground to permit germination etc. This will require scrub and canopy clearance, maintenance of grazing, protection of water supply and quality, and periodic clearance of the fire pool. However, the genetic threat to the species remains, both due to possible genetic bottleneck (a low population point resulting in loss of genetic diversity) coupled with isolation from the usual mechanism of gene flow and seed dispersal in coastal waters. The restoration of access to the sea from the present locations, notwithstanding sea-level rise, seems improbable in the short to medium term (given the apparent permanence of forest cover) and may require manipulation of the gene pool and/or translocation of a population to a more appropriate location.
SPC Condition Assessment	**Feature 1: Embryonic shifting dunes: Unfavourable** The embryonic shifting dunes at Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes SAC, as monitored in 2005 are in an unfavourable condition largely due to failure to meet the target for the range of zones within the vegetation structure (a CSM mandatory attribute), i.e. the intact zonation between embryonic dunes through yellow dune to fixed dune grassland along 95% of the frontage. This is primarily due to the afforestation of unit 20 (001901).

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	Shifting dunes along the shoreline with Ammophila arenaria (2120): Unfavourable The shifting dunes along the shoreline with *Ammophila arenaria* (“white dunes”) at Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes SAC in 2005 are in an unfavourable condition largely due to failure to meet the target for the range of zones within the vegetation structure (a CSM mandatory attribute), i.e. the intact zonation between embryonic dunes through yellow dune to fixed dune grassland along 95% of the frontage. This is primarily due to the afforestation of unit 20 (001901). The area of shifting dunes has contracted dramatically over the past half century, and is now concentred in a narrow band about 100- 200m wide behind the embryonic dunes, with smaller outliers at the landward edge of some slacks where dune ridges maintain some mobility. There is particularly good representation of this feature at Tywyn Aberffraw, including some inland examples, whereas at Newborough Warren the feature is compromised by the conifer plantation, which has truncated the normal zonation from yellow dune to fixed dune grassland in Unit 20. **Fixed dunes with herbaceous vegetation (“grey dunes”) (2130): Unfavourable** The fixed dunes with herbaceous vegetation (“grey dunes”) at Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes SAC in 2005 are in an unfavourable condition due in part to the truncation of the natural zonation by the conifer plantation at Newborough and to the preponderance of grassy conditions in the fixed dune – lichen heath vegetation on Morfa Dinlle. **Dunes with *Salix repens* ssp *argentea* (*Salicion arenariae*) (2170): Unfavourable** The dunes with *Salix repens* ssp. *argentea* (*Salicion arenariae*) at Y Twyni o Abermenai I Aberffraw / Abermenai to Aberffraw Dunes SAC in 2005 are in an unfavourable condition. The monitoring results (Creer 2006) show that the dunes with *Salix repens* vegetation at Tywyn Aberffraw is in an unfavourable condition and the dunes with *Salix repens* vegetation at Newborough Warren is in a favourable condition. However, for the feature to be considered in a favourable condition at Abermenai to Aberffraw Dunes SAC, each of the SSSIs possessing the feature would have to fulfil

	Abermenai to Aberffraw Dunes SAC
	the requirements of the performance indicators (see Table 27). Thus, the overall condition of the dunes with *Salix repens* vegetation at Abermenai to Aberffraw Dunes SAC is unfavourable. The cause of this condition is not entirely clear, but would appear to be related to lowered water tables and the development of scrub in at least some cases. **Humid dune slacks (2190): Unfavourable** The humid dune slacks at Y Twyni o Abermenai I Aberffraw / Abermenai to Aberffraw Dunes SAC in 2005 are in an unfavourable condition. From the monitoring results obtained (Creer 2006), it can be concluded that the humid dune slack vegetation at Tywyn Aberffraw and Newborough Warren is in an unfavourable condition. The feature does not occur at Morfa Dinlle as this site is underlain by shingle ridges. For the feature to be considered in a favourable condition at Abermenai to Aberffraw Dunes SAC, each of the SSSIs possessing the feature would have to fulfil the requirements of the performance indicators (see Table 26). Thus, the overall condition of the humid dune slack vegetation at Abermenai to Aberffraw Dunes SAC is unfavourable. This is attributed to general lowering of the water table at both sub-sites and consequential succession to dryer vegetation **Petalwort (1395): Unfavourable Declining** The petalwort *Petalophyllum rafsii* at Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes SAC in 2005 is in an unfavourable declining condition. Although monitoring indicates that its status at Tywyn Aberffraw is within the limits set, its abundance and distribution on the Newborough dunes fails to achieve the target level and appears to be declining. There is some indication that this may be due to drying out and possible changes in ground chemistry. **Shore dock (1441): Unfavourable Declining** The shore dock (*Rumex rupestris*) at Y Twyni o Abermenai i Aberffraw / Abermenai to Aberffraw Dunes SAC in 2005 is in unfavourable declining condition.

	Abermenai to Aberffraw Dunes SAC
Vulnerabilities (includes existing pressures and trends)	Dune stabilization Existing conifer forest constraining dunes and reducing water table Spread of *Hippophae rhamnoides* and pine seedlings Abandonment of traditional grazing Shading and scrub development Dune stabilisation is leading to the gradual loss of early successional phases. The maintenance of dynamic geomorphological processes is constrained at Newborough by the conifer forest that occupies the same part of the site. The hydrological integrity of the site is also compromised by water-table reduction due to the conifer crop. The spread of Hippophae rhamnoides and pine seedlings from the forest threaten the dunes, and both are controlled by cutting and spraying. There is no ready solution to these problems without removal of part of the forest. Redesign of the forest is now under discussion with the Forestry Commission. Abandonment of traditional grazing on Aberffraw common land could occur due to traffic hazards on unfenced roads, and the installation of cattle grids is under discussion with the owners. The ecological requirements of shore dock are not well known, although shading and scrub development on its forest refuge appears to be a threat. This is being tackled by tree removal and pony grazing, resulting in an increase in the shore dock population.
Landowner/ Management Responsibility	Isle of Anglesey, Gwynedd.
HRA/AA Studies undertaken that address this site	*Wales Spatial Plan Update (WSPU) - HRA and AA 2008* WSPU has potential to have adverse effects of Abermenai to Aberffraw Dunes SAC in combination with other plans. *Gwynedd Unitary Development Plan-Habitats Regulations Assessment 2008* Main concerns were about the hydrological integrity of the site due to a confier crop and that dune

	Abermenai to Aberffraw Dunes SAC
	stabilisation is leading to the gradual loss of early successional phases. The screening report concluded that no significant effects are likely.

Site Name: Afon Gwyrfai/ Llyn Cwellyn SAC

- **Location: 53 04 59 N/ 04 10 15 W**
- **SAC EU Code: UK0030046**
- **Size: 114.29 Ha**
- **Designation: SAC**

	Afon Gwyrfai/ Llyn Cwellyn SAC
Site Description	Llyn Cwellyn is a large reservoir situated by A4085, near to the village of Rhydd Du, situated on the Afon Gwyrfai in Nant y Betws between the Snowdon Massif and Mynydd Mawr. The reservoir provides drinking water to parts of Gwynedd and Anglesey. In times past referred to as Llyn Quellyn, the lake is very deep and is one of the few in Wales to contain a natural population of Artic char, it also contains trout. Llyn Cwellyn is a glacial moraine lake formed during the last Ice Age and is now dammed at the northern end, near to the small village of Betws Garmon.
	Llyn Cwellyn (*Llyn Quellyn* in some antiquated texts) is a reservoir in North Wales which supplies drinking water to parts of Gwynedd and Anglesey. It lies on the Afon Gwyrfai in Nant y Betws between the Snowdon Massif and Mynydd Mawr in the northern part of Snowdonia National Park. It has an area of 215 acres (0.87 km²), and is over 120 ft (37 m) deep. At the southern end is the small village of Rhyd Ddu. Although it is now dammed at the northern end, near the village of Betws Garmon this has not substantially increased the size of the natural glacial moraine lake that has existed since the last ice age. The lake is very deep and is one of the few lakes in Wales to support a natural population of Arctic char. The lake water has been confirmed as the source of an outbreak of Crypyosporidiosis in November-December 2005. Contamination appears to have occurred from septic tanks or cess pits in the

	Afon Gwyrfai/ Llyn Cwellyn SAC
	catchment. The Lake is passed the whole of its length by the A4085, which borders it so closely, at places the tarmac is being undermined. Running the length of the lake, although further up the mountainside is the Welsh Highland Railway, which offers splendid views of the lake from the south. Road and railway both run from Caernarfon to Beddgelert and then through the Aberglaslyn Pass to Porthmadog. They come together at Rhyd Ddu railway station at the start of the Rhyd Ddu path to the summit of Snowdon. Rail and road run side by side for over half a mile to the summit of the mountain pass at Pitt's Head where the road passes over the railway before descending steeply through Nant Colwyn to Beddgelert. Pitt's Head is also the starting point of the 'Beddgelert' branch of the Rhyd Ddu path to Snowdon. Midway along the eastern shore of the lake is the starting point of the easier but less sensational Snowdon Ranger path to the summit of Snowdon.
Qualifying Features	***Annex I habitats that are a primary reason for selection of this site:*** **3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*** Llyn Cwellyn, north Wales, is an oligotrophic glacial lake (Type 3) representative of oligotrophic lakes found in the mountains of Snowdonia. It is a relatively large, deep lake, in contrast to Llyn Idwal, also in Snowdonia. Because of its depth the lake stratifies during the summer, with a thermocline developing at 10-15 m depth that has a marked effect upon the ecology of the site. Although the site has acidified since the late 19th century, water quality remains high and Llyn Cwellyn supports one of the few native Welsh populations of Arctic charr *Salvelinus alpinus* (‘Torgoch’ in Welsh). The macrophyte flora of Llyn Cwellyn is characterised by abundant shoreweed *Littorella uniflora*, water lobelia *Lobelia dortmanna*, quillwort *Isoetes lacustris*, bulbous rush *Juncus bulbosus* and alternate

	Afon Gwyrfai/ Llyn Cwellyn SAC
	water-milfoil *Myriophyllum alterniflorum*. The rare awlwort *Subularia aquatica* is abundant in places and **1831 Floating water-plantain *Luronium natans*** occurs at this site. Six-stamened waterwort *Elatine hexandra* has been recorded in shallow water off the north shore and bog pondweed *Potamogeton polygonifolius* occurs in stream inflows in the south. **3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation** *The Gwyrfai is a good example of the small, steep rivers that occur in north-west Wales. It is dominated by base-poor rock and contains extensive beds of the most oligotrophic end of sub-type 3 of this habitat, dominated by stream water-crowfoot* Ranunculus penicillatus *ssp.* penicillatus*, intermediate water-starwort* Callitriche hamulata*, aquatic mosses* Fontinalis *spp. and bulbous rush* Juncus bulbosus*. The conservation value of the site is enhanced by the presence of good adjacent river corridor habitat, and by the presence of Llyn Cwellyn, a good example of a* Littorella – Lobelia – Isoetes *oligotrophic lake.* ***Annex II species that are a primary reason for selection of this site:*** **1106 Atlantic salmon *Salmo salar*** The Afon Gwyrfai in north-west Wales is representative of the small montane rivers in this region. It contains a largely unexploited salmon population with a characteristically late run. Environment Agency electrofishing data indicates the presence of healthy juvenile populations downstream of Llyn Cwellyn. **1831 Floating water-plantain *Luronium natans*** Llyn Cwellyn and its outflow, the Afon Gwyrfai, support one of the largest and most diverse populations of **floating water-plantain *Luronium natans*** anywhere in Britain. There are extensive submerged, vegetative beds of this species in the clear, oligotrophic waters of the lake and (generally) several small flowering colonies around its edge whilst, downstream from the lake, *L.*

	Afon Gwyrfai/ Llyn Cwellyn SAC
	natans occupies a highly unusual – and vulnerable – habitat along several hundred metres of slow-moving river. The diversity of growth forms and their range across the Cwellyn-Gwyrfai makes this an internationally significant site for the species. Annex II species present as a qualifying feature, but not a primary reason for site selection
Conservation Objectives	**The ecological status of the water course is a major determinant of FCS for all features. The required conservation objective for the water course is defined below:** • The capacity of the habitats in the SAC to support each feature at near-natural population levels, as determined by predominantly unmodified ecological and hydromorphological processes and characteristics, should be maintained as far as possible, or restored where necessary. • The ecological status of the water environment should be sufficient to maintain a stable or increasing population of each feature. This will include elements of water quantity and quality, physical habitat and community composition and structure. It is anticipated that these limits will concur with the relevant standards agreed between CCW and the Environment Agency through the Review of Consents process. • Flow regime, water quality and physical habitat should be maintained in, or restored as far as possible to, a near-natural state, in order to support the coherence of ecosystem structure and function across the whole area of the SAC. • All known breeding, spawning and nursery sites of species features should be maintained as suitable habitat as far as possible, except where natural processes cause them to change. • Flows, water quality, substrate quality and quantity at fish spawning sites and nursery areas will not be depleted by abstraction, discharges, engineering or gravel extraction activities or other impacts to the extent that these sites are damaged or destroyed. • The river plan-form and profile should be predominantly unmodified. Physical modifications having an adverse effect on the integrity of the SAC, including, but not limited to, revetments on active alluvial river banks using stone, concrete or waste materials, unsustainable extraction of gravel, addition or release of excessive quantities of fine sediment, will be avoided.

	Afon Gwyrfai/ Llyn Cwellyn SAC
	• River habitat SSSI features should be in favourable condition. • Artificial factors impacting on the capability of each species feature to occupy the full extent of its natural range should be modified where necessary to allow passage, for example weirs, bridge sills, acoustic barriers. • Natural factors such as waterfalls, which may limit the natural range of a species feature or dispersal between naturally isolated populations, should not be modified. • Flows during the normal migration periods of each migratory fish species feature will not be depleted by abstraction to the extent that passage upstream to spawning sites is hindered. • Levels of nutrients, in particular phosphate, will be agreed between the EA and CCW in the Water Framework Directive water body in the Afon Gwyrfai a Llyn Cwellyn SAC, and measures taken to maintain nutrients below these levels. It is anticipated that these limits will concur with the standards to be agreed between CCW and Environment Agency Wales used by the Review of Consents process. • Levels of water quality parameters that are known to affect the distribution and abundance of SAC features will be agreed between EA and CCW for the Water Framework Directive water body in the Afon Gwyrfai a Llyn Cwellyn SAC and measures taken to maintain pollution below these levels. It is anticipated that these limits will concur with the standards to be agreed between CCW and Environment Agency Wales used by the Review of Consents process. • Potential sources of pollution not addressed in the Review of Consents, such as contaminated land, forestry operations and improvement of riparian habitat, will be considered in assessing plans and projects. • Levels of suspended solids will be agreed between EA and CCW for the Water Framework Directive water body in the Afon Gwyrfai a Llyn Cwellyn SAC.Measures including, but not limited to, the control of suspended sediment generated by agriculture, forestry and engineering works, will be taken to maintain suspended solids below these levels. **Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and**

	Afon Gwyrfai/ Llyn Cwellyn SAC
	/or of the *Isoteo-Nanojuncetea* (EU Habitat Code: 3130): The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: 1. Water quality of the lake is within parameters which are suitable to support the characteristic flora and fauna. 2. The lake shows a characteristic vegetation zonation from the shore to the deeper water. 3. The lake has a macrophyte flora which includes many of the characteristic species including *Littorella uniflora*, *Lobelia dortmanna*, *Isoetes lacustris*, *Luronium natans* and *Subularia aquatica,* together with a diverse range of associates including *Myriophyllum alterniflorum*, *Callitriche hamulata, Nitella flexilis* and *Potamogeton berchtoldii.* 4. *Nitella gracilis* and *Luronium natans* to be present as characteristic plants. **Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (EU Habitat Code: 3130):** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: 1. The conservation objective for the water course as defined in 4.1 above must be met. 2. The extent of this feature within its potential range in this SAC should be stable or increasing. 3. The extent of the sub-communities that are represented within this feature should be stable or increasing. 4. The conservation status of the feature's typical species should be favourable. 5. All known, controllable factors, affecting the achievement of these conditions are under control (many factors may be unknown or beyond human control). **Atlantic salmon *Salmo salar* (EU Species Code 1106):** 1. The conservation objective for the water course as defined in 4.1 above must be met 2. The population of the feature in the SAC is stable or increasing over the long term. 3. The natural range of the feature in the SAC is neither being reduced nor is likely to be reduced for

	Afon Gwyrfai/ Llyn Cwellyn SAC
	the foreseeable future. The natural range is taken to mean those reaches where predominantly suitable habitat for each life stage exists over the long term. Suitable habitat is defined in terms of near-natural hydrological and geomorphological processes and forms for example suitable flows to allow upstream migration, depth of water and substrate type at spawning sites, and ecosystem structure and functions. Suitable habitat need not be present throughout the SAC but where present must be secured for the foreseeable future. Natural factors such as waterfalls may limit the natural range of individual species. Existing artificial influences on natural range that cause an adverse effect on site integrity, such as physical barriers to migration, will be assessed.The Gwyrfai will continue to be sufficiently large habitat to maintain the feature's population in the SAC on a long-term basis. **Floating water-plantain *Luronium natans* (Code:1831):** The vision for this feature is for it to be in favourable conservation status, where all of the following conditions are satisfied: • The conservation objective for the water course as defined in 4.1 above must be met. • Llyn Cwellyn will continue to support a peripheral floating water-plantain assemblage, as well as a deeper water assemblage, with a characteristic zonation of vegetation from the shore at two areas of the lake. • Floating water-plantain will continue to flourish in the Afon Gwyrfai and will continue to occur in every selected section • All factors affecting the achievement of these conditions are under control.
Component SSSIs	Afon Gwyrfai a Llyn Cwellyn SSSI
Key Environmental Conditions (factors that	**Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and /or of the**

	Afon Gwyrfai/ Llyn Cwellyn SAC
maintain site integrity)	***Isoteo-Nanojuncetea (3130):*** **Acidification:** Diatom analysis suggests that Llyn Cwellyn has suffered from progressive moderate acidification since 1860 (0.7 – 0.8pH decline). From core samples, the rate of acidification is thought to have increased in 1940's either as a result of background levels or through forestry operations within the catchment. From the 1980's to 1995 subtle changes in diatom composition suggest a slight reversal, thought to be caused by a drop in sulphur deposition within the catchment. Continued monitoring of biological, chemical and physical aspects of the lake should continue to be undertaken. **Localised Sedimentation and Nutrient In wash:** Future condition assessments should examine whether *J. bulbosus* and *Sphagnum* spp. continue to increase in abundance as a result of nutrient enrichment and sedimentation or whether they decline in abundance, perhaps as a result of a continuing reversal in the historic acidification trend or a reduction in mineral in-wash. The extent of sediment in-wash to the lake from grassland improvement (liming) and the felling of trees within the catchment should be monitored. **Characteristic Species:** The Red Data Book and Annex II species, *L. natans* and *N. gracilis* should be monitored to ensure that these rare plants are not lost. **Drinking Water Abstraction:** Llyn Cwellyn is used as a drinking water abstraction point. It is crucial that sudden changes in water level are avoided in addition to the introduction of fish stock..The use of the lake within the SAC for angling is currently relatively limited. **Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (3260):** Factors that are important to the favourable conservation status of this feature include flow, substrate quality and water quality, which in turn influence species composition and abundance. These factors often interact, producing unfavourable conditions by promoting the growth of a range of algae and other species indicative of eutrophication. Under conditions of prolonged low flows and high nutrient

	Afon Gwyrfai/ Llyn Cwellyn SAC
	status, epiphytic algae may suppress the growth of aquatic flowering plants. Favourable management for this feature is therefore largely dependent on ensuring that sufficient depth, velocity and duration of flow and sufficiently low phosphate levels are maintained within the natural range of the vegetation. A favourable flow regime can be defined with reference to naturalised flows (removing the influence of artificial abstractions and discharges from flow records). The Mean Trophic Rate (MTR) scores for all but the downstream management unit were high, being between 74 – 90. This implies that the river is not significantly impacted by phosphate inputs. The slightly lower score on the downstream site suggests only minimal phosphate input, (Scarlett et al 2003). Equally, recent EA monitoring of water quality scored the Afon Gwyrfai as grade 1, which equates to <0.02mg/l phosphate levels. Invasive non-native plants can have a detrimental impact on this feature. Removal of *Impatiens glandulifera* and *Fallopi japonica* is a priority. **Atlantic salmon *Salmo salar (1106):*** The relatively demanding water quality and spawning substrate quality requirements of this feature mean that reduction in diffuse pollution and siltation impacts is important. Elevated levels of fines (particles <0.83mm) within spawning substrates can interfere with egg and fry survival. Clean substrate free from excessive siltation should predominate at suitable spawning sites. Spawning habitat is defined as stable coarse substrate without an armoured layer, in the pebble to cobble size range (16-256 mm) but with the majority being <150 mm. Water depth during the spawning and incubation periods should be 15-75 cm. Fry habitat is indicated by water of <20 cm deep and a gravel/pebble/cobble substrate. Parr habitat is indicated by water 20-40 cm deep and similar substrate. Holding areas are defined as pools of at least 1.5 m depth, with cover from features such as undercut banks, vegetation, submerged objects and surface turbulence. Coarse woody debris should not be removed from rivers as it plays a significant role in the formation of new gravel beds, and provides cover for fish and a source of food for invertebrates. The most significant sources of diffuse pollution and siltation are from agriculture, including fertilizer run-off, livestock manure,silage effluent and soil erosion. The most intensively used areas such as

	Afon Gwyrfai/ Llyn Cwellyn SAC
	heavily trampled gateways and tracks can be especially significant sources of polluting run-off. Preventative measures can include surfacing of tracks and gateways, moving feeding areas, and separating clean and dirty water in farmyards. Farm operations should avoid ploughing land which is vulnerable to soil erosion or leaving such areas without crop cover during the winter. Among toxic pollutants, sheep dip and silage effluent present a particular threat to aquatic animals in this predominantly rural area. Contamination by synthetic pyrethroid sheep dips, which are extremely toxic to aquatic invertebrates, can deprive fish populations of food over large stretches of river. These impacts can arise if recently dipped sheep are allowed access to a stream or hard standing area, which drains into a watercourse. Pollution from organophosphate sheep dips and silage effluent can be very damaging locally. Pollution from slurry and other agricultural and industrial chemicals, including fuels, can kill all forms of aquatic life. All sheep dips and silage, fuel and chemical storage areas should be sited away from watercourses or bunded to contain leakage. Recently dipped sheep should be kept off stream banks. Used dip should be disposed of strictly in accordance with Environment Agency Regulations and guidelines. Statutory and voluntary agencies should work closely with landowners and occupiers to minimise the risk of any pollution incidents and enforce existing regulations. Measures to control diffuse pollution in the water environment, including ‘Catchment Sensitive Farming’, may be implemented as a result of the Water Framework Directive and, along with existing agri-environment schemes, will help to achieve the conservation objectives for the SAC. Discharges from sewage treatment works, urban drainage, engineering works such as road improvement schemes, contaminated land, and other domestic and industrial sources can also be significant causes of pollution, and must be managed appropriately. Current consents for discharges entering, or likely to impact upon the site should be monitored, reviewed and altered if necessary. Overhanging trees provide valuable shade and food sources, whilst tree root systems provide important cover and flow refuges for juveniles. At least 50% high canopy cover to the water course/banks should be maintained, where appropriate. Some reaches may naturally have lower tree cover. Cover may also be lower in urban reaches. Artificial barriers should be made passable.

	Afon Gwyrfai/ Llyn Cwellyn SAC
	The impact of existing barriers in the Afon Gwyrfai a Llyn Cwellyn should be assessed on a case-by-case basis. Physical modification of barriers is required where depth/velocity/duration of flows is unsuitable to allow passage. Complete or partial natural barriers to potentially suitable spawning areas should not be modified or circumvented. Entrainment in water abstractions directly impacts on population dynamics through reduced recruitment and survival rates. Intake screens must meet statutory requirements under the Salmon and Freshwater Fisheries Act. There is currently no stocking of salmon into the Afon Gwyrfai a Llyn Cwellyn. The management objectives for SAC salmon populations are to attain naturally self-sustaining populations. Salmon stocking should not be routinely used as a management measure. Salmon stocking represents a loss of naturalness and, if successful, obscures the underlying causes of poor performance (potentially allowing these risks to perpetuate). It carries various ecological risks, including the loss of natural spawning from broodstock, competition between stocked and naturally produced individuals, disease introduction and genetic alterations to the population. Therefore, there is a presumption against salmon stocking in the Afon Gwyrfai a Llyn Cwellyn SAC. The presence of artificially high densities of other fish can create unacceptably high levels of predatory and competitive pressure on juvenile salmon and the aim should be to minimise these risks in considering any proposals for stocking. Escapes from fish farms are a form of uncontrolled introduction and should be prevented by effective screening on all intakes and discharges. Controls on exploitation should include migratory passage to the SAC within territorial waters, including estuarine and coastal net fisheries, as well as exploitation within the SAC from rod fisheries. Net Limitation Orders are used to control the estuarine fishery. Exploitation of salmon by rod fisheries is regulated by EA licensing and byelaws controlling the fishing season and allowable methods. **Floating water-plantain *Luronium natans (1831):*** Infrastructure or river maintenance works, requiring the intentional movement of substrate is the vicinity of known populations of this plant, to be avoided. No intentional disturbance of existing water plants, other than by natural events.

	Afon Gwyrfai/ Llyn Cwellyn SAC
	Buffer zones around riverine and lake areas to reduce nutrient input, especially where *Luronium* in known to occur.
SPC Condition Assessment	**Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and /or of the *Isoteo-Nanojuncetea (3130):*** Unfavourable Recovering. This is due to an historic moderate acidification of Llyn Cwellyn since the 1860's. This trend in acidification may be reverting, but patterns need to be monitored. Some concerns over localised nutrient enrichment, sedimentation and from continued water abstraction. **Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (3260):** Favourable Important stands have been identified in management units 2, 4, 5, 6, 7 and 8. In 2007 the feature was monitored against JNCC guidelines in management units 2, 5, 6 and 7. However, the report has not yet been published. The most recent published vegetation survey was that of Scarlett *et al*. (2003). Surveys were carried out at 5 locations in management units 2, 4, 6, 7, and 8. These were classified into JNCC river groups. The condition of the plant communities was good at all sites. Invasive species *Impatiens glandulifera* was recorded at two of the sites and *Fallopia japonica* at one site. **Atlantic salmon *Salmo salar (1106):*** Unfavourable: Unclassified. Monitoring of Atlantic salmon in the Afon Gwyrfai and Llyn Cwellyn SAC relies on two methods: i. Estimation of adult run size from angling catch returns, ii. Electro-fishing for juveniles in nursery areas. The current unfavourable status results from a precautionary assessment of feature distribution and abundance, in particular the results of salmon catches and juvenile surveys, and from the presence of adverse factors, in particular flow depletion.

	Afon Gwyrfai/ Llyn Cwellyn SAC
	Floating water-plantain *Luronium natans (1831):* favourable condition The habitat is reported as in favourable condition for extent and abundance of peripheral floating water-plantain (2005 SAC Monitoring Report). This status is conditional upon a deeper water survey being undertaken within the next reporting round (2006-2011) to establish the extent and abundance of under water population(s) of this plant within Llyn Cwellyn. Revised conservation objectives for the distribution of *Luronium natans* within Llyn Cwellyn, would be set after this survey is completed. The favourable condition status is also conditional upon the water quality status being maintained.
Vulnerabilities (includes existing pressures and trends)	The lake is utilised as a raw drinking water reservoir. The present abstraction regime is compatible with its nature conservation status. Recent investigations have revealed that Llyn Cwellyn has acidified by 0.7 pH units since the late 1800s, due to increases in emissions of oxides of sulphur and nitrogen and subsequent acidic depositions in the form of 'acid rain'. The management of the extensive block of coniferous plantation on the shores of Llyn Cwellyn is an important factor in safeguarding the conservation value of the lake. A management plan has been agreed upon between the Countryside Council for Wales and Forest Enterprise. Negotiations are in progress to redesign the plantation to remove trees from around tributary streams, and hence reduce any further risk of acidification. The Afon Gwyrfai is likely to be most vulnerable to cumulative impacts of small-scale changes along its length which may affect water quality and habitat structure.
Landowner/ Management Responsibility	Gwynedd.
HRA/AA Studies undertaken that address this site	Not known

Site Name: Anglesey Coast and Saltmarsh, Gwynedd

- **Location: 042519 W/ 530942 N**
- **SAC EU Code UK0020025**
- **Size: 1058 ha**
- **Designation: SAC**

	Anglesey Coast and Saltmarsh, Gwynedd SAC
Site Description	The Anglesey Coast Saltmarsh SAC is part of a complex of saltmarsh and sand dunes, including the Braint, Cefni and Ffraw estuaries, in the south west of Anglesey. The most significant area of saltmarsh can be seen on Malltraeth Sands in the Cefni estuary where there are large expanses of glasswort, a small fleshy annual pioneer on the mudflats. In the Braint estuary the plant life is characterised by unusually large amounts of greater sea-spurrey, with its deep pink flowers, whilst in the Cefni estuary the sea rush is more typical. This is one of the largest areas of sea rush saltmarsh in Britain. Cord grass or *Spartina*, an invasive species, is spreading onto some areas as sediments accumulate in response to changes in estuarine dynamics. Wading birds such as knot and dunlin and all sorts of wildfowl including wigeon, teal and Brent geese feed on the saltmarsh during the winter months, while skylark and stonechat can be seen in the skies during the summer months.
Qualifying Features	***Annex I habitats that are a primary reason for selection of this site:*** **1310 *Salicornia* and other annuals colonising mud and sand** This is part of a complex of saltmarsh and dune habitats lying either side of the dune systems at Newborough Warren, north Wales. It is therefore important in terms of the structural integrity of the site, which has been selected primarily for a range of sand dune Annex I types. The most significant stands of *Salicornia* spp. saltmarsh occur on Malltraeth Sands in the Cefni estuary.

	Anglesey Coast and Saltmarsh, Gwynedd SAC
	1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) This site, which includes both the Braint and Cefni estuaries, forms a complex of saltmarsh and dune habitats lying either side of the dune systems at Newborough Warren. **Atlantic salt meadows** form the bulk of the saltmarsh vegetation, but much of it is far from typical. In the Braint estuary the vegetation is characterised by unusually large amounts of greater sea-spurrey *Spergularia media*, whilst in the Cefni estuary the more typical Atlantic salt meadow is subordinate to saltmarsh dominated by sea rush *Juncus maritimus*. In fact, this is one of the largest stands of *Juncus maritimus* saltmarsh in Britain, and has affinities with **1410 Mediterranean salt meadows** (***Juncetalia maritimi***), an Annex I vegetation type that is not now considered to occur in the UK.
Conservation Objectives	***Salicornia* and other annuals colonising mud and sand (1310):** • The vision for this feature is for it to be in a favourable conservation status, where, subject to natural processes1 all of the following conditions are satisfied: • the distribution and extent of Salicornia and other annuals is determined predominantly by natural structure and environmental processes; • the natural habitat structures necessary for the long-term maintenance of Salicornia and other annuals and their typical species are maintained; • the granulometry and structure of Salicornia and other annuals' sediments, and their natural variation, distribution and extent, are determined predominantly by natural sediment supply and transport processes; • the geomorphology of the Salicornia and other annuals feature, and its natural variation, distribution and extent, are determined predominantly by the underlying geology and natural environmental processes; • the natural environmental processes necessary for the long-term maintenance of the Salicornia and other annuals feature and its typical species, are maintained; • the hydrographic and meteorological processes necessary for the long-term maintenance of the Salicornia and other annuals feature and its typical species are determined predominantly by

	Anglesey Coast and Saltmarsh, Gwynedd SAC
	natural environmental processes; • the salinity regime and gradients of the Salicornia and other annuals feature are determined predominantly by natural hydrodynamic, hydrological and meteorological processes; • nutrients in the water column and sediments remain within ranges that are not potentially detrimental to the long-term maintenance of the Salicornia and other annuals' communities, their distribution and range; • contaminants in the water column and sediments derived from human activity remain below levels potentially detrimental to the long-term maintenance of the Salicornia and other annuals' communities, their distribution and range; • dissolved oxygen levels in the water column and sediments are determined predominantly by natural environmental processes • communities of typical species are maintaining their conservation status on a long-term basis as viable components of the Salicornia and other annuals' habitats • the management of activities or operations likely to degrade the distribution, extent, structure, function or typical species communities of the feature, is appropriate for maintaining favourable conservation status and is secure in the long-term. **Atlantic salt meadows (1330):** The vision for this feature is for it to be in a favourable conservation status, where, subject to natural processes all of the following conditions are satisfied: • the distribution and extent of the saltmeadows is determined predominantly by natural structure and environmental processes; • the natural habitat structures necessary for the long-term maintenance of the saltmeadows and typical species are maintained; • the granulometry and structure of the saltmeadows' sediments, and their natural variation, distribution and extent, are determined predominantly by natural sediment supply and transport processes;

	Anglesey Coast and Saltmarsh, Gwynedd SAC
	• the geomorphology of the saltmeadows, and their natural variation, distribution and extent, are determined predominantly by the underlying geology and natural environmental processes; • the hydrographic and meteorological processes necessary for the long-term maintenance of the saltmeadows and their typical species are determined predominantly by natural environmental processes; • the salinity regime and gradients within the saltmeadows are determined predominantly by natural hydrodynamic, hydrological and meteorological processes; • nutrients in the water column and sediments are within ranges that are not potentially detrimental to the long-term maintenance of the saltmeadows' communities, their distribution and range; • contaminants in the water column and sediments derived from human activity remain below levels potentially detrimental to the long-term maintenance of the saltmeadows' communities, their distribution and range; • dissolved oxygen levels in the water column and sediments are determined predominantly by natural environmental processes; • the zonation of saltmarsh from pioneer, lower mid marsh and upper mid marsh and their transitions to fresh water and terrestrial vegetation are maintained; • communities of typical species are maintaining their conservation status on a long-term basis as viable components of the saltmeadows' habitats, • the species richness, community dynamics, abundance, biomass, community structures, physiological health, reproductive capacity, recruitment and range are maintained: • the management of activities or operations likely to degrade the distribution, extent, structure, function or typical species comunities of the feature, is appropriate for maintaining favourable conservation status and is secure in the long-term.
Component SSSIs	• Newborough Warren – Ynys Llanddwyn SSSI • Tywyn Aberffraw • Tre Wilmot • Glannau Ynys Gybi/Holy Island Coast

	Anglesey Coast and Saltmarsh, Gwynedd SAC
	Maps containing the component SSSIs can be viewed on the CCW website: http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/bae-cemlyn--cemlyn-bay-sac.aspx
Key Environmental Conditions (factors that maintain site integrity)	***Salicornia* and other annuals colonising mud and sand (1310):** The development of Salicornia stands is subject to a high degree of stochastic variation as regards distribution and extent. No intervention is considered appropriate at this time. **Atlantic salt meadows (1330):** The ASM feature fails the condition monitoring due to the incomplete zonation present in some transects and to the presence of coastal defence or modified habitat at the terrestrial transition. This includes the causeway (Malltraeth Cob) and the presence of conifer plantation on the shoreline behind the Cefni saltmarsh, both of which truncate the full zonation from pioneer saltmarsh to freshwater and natural terrestrial habitat. It is unclear whether the removal of the Malltraeth Cob is a realistic expectation – although the benefit to the ecological restoration of the Glannau Mon SAC should be recognised if its removal for other objectives were ever to be considered. However, the modification of the conifer plantation to swamp, dune and semi-natural broadleaf woodland along the saltmarsh boundary is a realistic expectation under the Forest Design Plan.
SAC Condition Assessment	***Salicornia* and other annuals colonising mud and sand (1310): Favourable** According to Lough et al 2007 condition is “unfavourable”. This is considered to be a misinterpretation of CSM guidance in regard to presence of artificial habitat on the shore. Other monitoring targets (On Braint estuary 2 out of 3 transects require >5% of transect as Salicornia habitat and on Cefni estuary 1 out of 3 transects require >5% of the transect to be Salicornia habitat) seem to have been met.

	Anglesey Coast and Saltmarsh, Gwynedd SAC
	Atlantic salt meadows (1330): Unfavourable
Vulnerabilities (includes existing pressures and trends)	Drastic modification to the Cefni estuary in the early 19th century continues to cause rapid accretion of sediment, permitting invasion by *Spartina anglica* on the seaward edges of the saltmarsh. This is reduced by herbicide treatment but successional development of saltmarsh over much of the present mudflat area is inevitable. Some development of *Spartina anglica* on the Braint estuary is also likely. This site forms part of Newborough Warren NNR.
Landowner/ Management Responsibility	Ynys Môn/ Isle of Anglesey.
HRA/AA Studies undertaken that address this site	Not known

Site Name: Glan-traeth Gwynedd

- **Location: 04 22 07 W/ 53 10 24 N**
- **SAC EU Code UK0030042**
- **Size: 14.1 ha**
- **Designation: SAC**

	Glan-traeth Gwynedd SAC
Site Description	Glan-traeth SAC lies to the southwest of the village of Newborough and is part of the adjacent Newborough Warren / Ynys Llanddwyn sand body although separated by the A4080 road. High counts since the mid-1980s confirm the presence of a large and viable great crested newt Triturus cristatus population occupying water-filled depressions that have resulted from sand extraction from the dune system. Night counts have revealed over 500 animals on several occasions, and the total population is probably considerably larger. Glan-traeth is lightly grazed by domestic livestock, thereby maintaining the open terrestrial habitat required for feeding and sheltering of adults. The species has suffered a marked decline throughout Britain, as a result of habitat loss and pollution and is specifically protected under the Wildlife and Countryside Act (1981). As well as great creseted newts, Glantraeth has other features that contribute to the special interest. These include open water, dune grassland and scrub which support other amphibians (palmate newt, common frog and common toad) along with several uncommon plants including early sand grass, meadow saxifrage, round leaved wintergreen and variegated horsetail. Unless specified below, management of this site should aim to look after these as well as the listed features of interest.
Qualifying Features	Annex II species that are a primary reason for selection of this site 1166 Great crested newt Triturus cristatus

	Glan-traeth Gwynedd SAC
Conservation Objectives	The interest feature will be considered to be in favourable conservation status when it reaches 100,000 populations. (Current is 25% below the favourable reference population). Although the UK Biodiversity Action Plan (BAP) target for this species by far exceeds this value at 200,000 populations, it is difficult to argue that this minimum value is not large enough to allow the long term survival of the species. The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions will be satisfied: • There will be a viable breeding great crested newt population present on the site. • Ample display/breeding ponds will be found on site. • Great crested newt larvae will be found in most of the breeding ponds. • Most of the display/breeding ponds on the site will have standing water during the average summer months. • The breeding ponds will dry out by mid summer occasionally (>5year intervals). • There will be adequate native water plants (macrophytes) for egg laying and adequate areas of bare pond bottom for displaying newts. • Surrounding vegetation will not heavily shade breeding and display ponds. • Algal blooms and surface sheens will be absent from display/breeding ponds. • Fish will be absent or rare in breeding/display ponds that support great crested newts. • Only small numbers of wildfowl will occur on the ponds. • The terrestrial habitat surrounding breeding ponds will comprise of refuge areas for newts, foraging areas, areas of hibernacula and corridors that will aid the movement of great crested newts back and forth with the neighbouring Newborough Warren – Ynys Llanddwyn SSSI (for migration, dispersal, foraging and genetic exchange purposes).

	Glan-traeth Gwynedd SAC
	• There will be no significant loss of great crested newts as a result of road engineering such as gully-pots. • Non-native aquatic species will be absent or if present, not at more than “occasional” frequency. • All factors affecting the achievement of the above conditions will be under control. • There should be at least three main ponds on the site with a scattering of smaller seasonal pools. Clear water should be present in the main ponds all year round in most years. The ponds should support a range of insects and submerged and floating water plants. There should be areas of open water over bare substrate (where newts can practice their elaborate night-time courtship displays) as well as more densely vegetated areas for egg laying. • In spring, the males display on the bottom of less vegetated part of the pond and the females wrap their yellowish eggs in the leaves of water forget-me-not and other water plants. Great crested newts should breed here each year, along with frogs, toads and palmate newts. • The land surrounding the ponds should be undulating, with a varied sward height, providing a variety of terrain including seasonally flooded wet ground and dry ridges and hummocks suitable for feeding, resting and hibernating amphibians. Around patches of bare sand in rabbit scrapes the early sand grass should grow, while meadow saxifrage will be seen in short turf. Round leaved wintergreen and variegated horsetail should occur in seasonally flooded areas. Small areas of blackthorn scrub will be tolerated and scattered clumps of gorse should be present throughout the site.
Component SSSIs	Glan-traeth SSSI Maps containing the component SSSIs can be viewed on the CCW website: http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--

	Glan-traeth Gwynedd SAC
	brecon-sac-list/bae-cemlyn--cemlyn-bay-sac.aspx
Key Environmental Conditions (factors that maintain site integrity)	**Great Crested Newts** There are a number of different factors that could damage the special feature at Glantraeth if they are not properly managed. These are the ones regarded as most important: Water quantity and quality There must be sufficient water must be in the main ponds for the period February through to early August. This will enable most newt tadpoles time to develop into young adults. Drying of the main pools, one year in ten, may be tolerated (see below). Gradually with time ponds tend to fill in due to the processes of siltation. This will make the ponds susceptible to drying out before the newt young have emerged from the water. The creation of additional ponds on the site would allow existing ponds to be cleaned in rotation. This would avoid the threat to the whole great crested newt population due to drying out of one or two crucial ponds. Plant nutrients can encourage algae, which cloud the water at the expense of other water plants making the ponds unusable for the great crested newts. Fertilisers, including land-spreading of effluent, should therefore be avoided anywhere on the site as they could pollute the pond water. Silage feeding on the site should also be avoided as it will encourage livestock to spread highly enriched material and faeces in or near the water. Pollution by road run off should also be avoided as it may contain oil or other toxins. Predation Fish, even sticklebacks, eat tadpoles and sometimes adult amphibians. Good breeding sites are fish-

	Glan-traeth Gwynedd SAC
	free, possibly due to occasional drying-out. Sticklebacks are abundant in the nearby Llyn Parc Mawr and the threat of transfer into the newt pools is a major concern. Waterfowl can also predate amphibians and should not be encouraged. Grazing Light grazing by cattle or ponies is beneficial for the site. The livestock help the control of water plants around the margins of the ponds, maintaining bare sections used for newt courtship purposes. Grazing also helps maintain diverse rough areas next to pools so that they can support a range of dwelling areas and food (slugs, crane flies, dung flies and dung beetles). Different types of vegetation provide a range of refuges amongst tussock bases and under scrub. Tall, grassy vegetation has high levels of humidity during the day, whilst tree roots, dense shrubby vegetation and stony or broken ground can provide refuges under the surface. Diverse vegetation structure is best achieved through the light grazing by cattle or ponies. Hibernation sites Great crested newts usually hibernate on dry land, where they can escape from frost. This includes burying down cracks in the ground, under tree roots and rabbit burrows. The piles of inert rubble at Glantraeth may be useful for this, especially as they have vegetated over and still have access cracks.
SAC Condition Assessment	**Conservation status of Primary species: Great Crested Newts: Unfavourable – inadequate and deteriorating.** The minimum favourable reference population is greater than the current estimate, but not by a factor of more than 25%. The assessment is therefore Unfavourable – Inadequate, and deteriorating to reflect current downward trends.

	Glan-traeth Gwynedd SAC
Vulnerabilities (includes existing pressures and trends)	Lowering of the water-table as extensive forestry plantations in Newborough Forest mature could possibly affect the permanence of shallow pools, important as newt breeding sites. Pond management or creation onsite would be considered if breeding habitat is adversely affected and monitoring of newt numbers shows that the population is affected. The next known great crested newt population is 2 km south-west. Main pressures • Cultivation • Modification of cultivation practices • Abandonment of pastoral systems • Removal of hedges and copses • Forestry clearance • Mineral extraction activities not referred to above – specifically chalk, coal and clay extraction • Urbanised areas, human habitation • Industrial or commercial areas • Communication networks • Water pollution • Landfill etc • Management of water levels • Silting up • Drying out • Eutrophication • Predation Threats

	Glan-traeth Gwynedd SAC
	• Modification of cultivation practices • Mineral extraction activities not referred to above – specifically chalk, clay and coal extraction • Urbanised areas, human habitation • Industrial or commercial areas • Communication networks • Landfill etc • Management of water levels • Silting up • Drying out • Predation Recent declines in this species have been attributed to habitat loss (ponds and terrestrial) resulting from agricultural intensification, development and drainage; habitat fragmentation, again resulting from agriculture and development; a reduction in suitable breeding sites following successional change; and the introduction of fish and wildfowl into once suitable habitat.
Landowner/ Management Responsibility	3 Private land owners Isle of Anglesey County Council
HRA/AA Studies undertaken that address this site	HRA of the Wales Waste Strategy, Sustainable Development Commission Wales. April 2009 The Glan-traeth site is listed under 'lakes and ponds' within the Key Sensitivities section of the report. The waste strategy's long terms aims will reduce the risks of future adverse effects to Natura 2000 sites. However the approach adopted to achieve the long term aims of the strategy does include some proposals which have the potential to impact Natura 2000 sites. The main potential impacts listed within this document include air emissions, water pollution and

	Glan-traeth Gwynedd SAC
	traffic emissions. It was not possible for the HRA to conclude no likely significant effect and an Appropriate Assessment is required. This is because the Wales Waste Strategy does not contain enough spatial information or details about proposed plant to establish whether significant effects will occur or are likely to occur at any of the Natura 2000 sites.

Site Name: Great Orme`s Head/ Pen y Gogarth

- **Location:53 19 57 N/03 51 13 W**
- **SAC EU Code UK0014788**
- **Size: 302.63 ha**
- **Designation: SAC**

	Great Orme`s Head/ Pen y Gogarth SAC
Site Description	Shingle. Sea cliffs. Islets (6%) Heath. Scrub. Maquis and garrigue. Phygrana (30%) Dry grassland. Steppes (39%) Humid grassland. Mesophile grassland (3%) Improved grassland (5%) Broad-leaved deciduous woodland (3%) Inland rocks. Screes. Sands. Permanent snow and ice (4%) Other land (including towns, villages, roads, waste places, mines, industrial sites) (10%) Vegetated sea cliffs of the Atlantic and Baltic coasts for which the area is considered to support a significant presence. European dry heaths for which this is considered to be one of the best areas in the United Kingdom. Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*) for which this is considered to be one of the best areas in the United Kingdom.
Qualifying Features	***Annex I habitats that are a primary reason for selection of this site****:* **4030 European dry heaths** This north Wales site is the finest example of limestone heath in the UK. The majority of this rare

	Great Orme`s Head/ Pen y Gogarth SAC
	and unusual vegetation is characterised by a short sward in which heather *Calluna vulgaris* and bell heather *Erica cinerea* occur in an intimate mixture with a rich assemblage of calcicolous grasses and herbs, such as meadow oat-grass *Helictotrichon pratense* and dropwort *Filipendula vulgaris*. Other types of dry heath present include various forms of H8 *Calluna vulgaris – Ulex gallii* heath. There are outstanding zoned sequences of limestone grassland and heath communities and these are associated with a wide range of other habitats, including limestone cliff, scree and a small area of **8240 Limestone pavements**. **6210 Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco-Brometalia*)** Great Orme's Head in north Wales supports one of the largest stands in the UK of CG1 *Festuca ovina – Carlina vulgaris* grassland. There is also an extensive area of CG2 *Festuca ovina – Avenula pratensis* grassland. This is one of only three selected sites in the UK where this *Xerobromion* grassland type occurs. The site contains a wide range of structural types, ranging from short turf on south-facing rocky slopes with abundant hoary rock-rose *Helianthemum oelandicum*, through more closed calcareous grassland communities to tall herb-rich vegetation on scrub margins. Transitions from calcareous grassland to calcareous and acidic heath, cliff, scree and **8240 Limestone pavements** are also well-represented.
Conservation Objectives	**European Dry Heath (4030):** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The dry heath occupies at least 25% of the total site area. • The dry heath is given the opportunity to expand at the expense of bracken and gorse but not at the expense of semi-natural dry grassland. • The dry heath is co-dominated by heather, bell heather and western gorse. • At least 33% of the dry heath is species-rich where the following plants are present; common rock-

	Great Orme`s Head/ Pen y Gogarth SAC
	rose, dropwort, sheep's-fescue, glaucous sedge, harebell, wild thyme and common bird'sfoot-trefoil. • Pioneer and building phases of heath vegetation are present. • Competitive species indicative of lack of management, bracken *Pteridium aquilinum*, gorse *Ulex europaeus* and native shrub and tree species are kept in check. • All factors affecting the achievement of these conditions are under control. **Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco – Brometalia*) (6210):** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The semi-natural dry grasslands occupy at least 35% of the total site area. • The semi-natural dry grasslands are given the opportunity to expand at the expense of bracken and gorse but not at the expense of dry heath. • The semi-natural dry grasslands are a species-rich mixture of characteristic herbs, grasses and sedges that include hoary rock-rose, common rock-rose, salad burnet, wild thyme, dropwort, common bird's-foot-trefoil, sheep's fescue, crested hair-grass, quaking grass, meadow oat-grass, glaucous sedge and spring sedge. • Terricolous lichens, acrocarpous mosses and bare rock and soil are present in the open short turf grassland community. • Species indicative of agricultural improvement and/or trampling are rare or absent. • Native shrub and tree species and bracken are rare or absent. • Invasive non-native species such as low growing and mat-forming Cotoneasters are absent. • All factors affecting the achievement of these conditions are under control.
Component SSSIs	Pen Y Gogarth / Great Orme's Head SSSI
Key Environmental	**European Dry Heath (4030)**

	Great Orme`s Head/ Pen y Gogarth SAC
Conditions (factors that maintain site integrity)	Active management may be needed to rejuvenate the dry heath. Rotational management to diversify structure and provide increased open ground and pioneer stages. Monitoring of this feature should include checking for increases in cover of species such as western gorse, bracken native shrubs and invasive non-native shrubs such as Cotoneaster spp. and strawberry tree. **Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco – Brometalia*) (6210):** Maintain livestock grazing but review sheep numbers and grazing period as increased rankness of sward has been detected. Continue to stabilise feral goat numbers. Understand population dynamics of rabbits. Maintain programme of eradication of invasive non-native species, for example low-growing, spreading species of Cotoneaster. Monitoring of this feature should include checking for presence of native shrub and tree invasion.
SPC Condition Assessment	**European Dry Heath (4030): 2006: Unfavourable – un-classified (LIFE 1999: Favourable – decline (**feared).) **Semi-natural dry grasslands and scrubland facies: on calcareous substrates (*Festuco – Brometalia*) (6210): 2006: Unfavourable – un-classified (LIFE 1999:** This feature was split between two features in the Management Plan: **Favourable – maintained** for British *Xerobomion* grasslands and **Favourable – decline** (feared) for British *Mesobromion* grasslands.)
Vulnerabilities (includes existing pressures and trends)	The plateau top of the Great Orme and its slopes are subject to high levels of grazing, which produces short cropped turf. On the steeper slopes there are areas which are undergrazed, due to difficult livestock access. Invasion by native and non-native shrub species is occurring in these areas. These problems are being addressed by a management plan agreed upon by CCW and the local authority. Recreational pressure on the Great Orme is substantial, as it is immediately adjacent to Llandudno, a major tourist centre. The site is managed as a Country Park and Local Nature

	Great Orme`s Head/ Pen y Gogarth SAC
	Reserve by the local authority in close consultation with CCW. A joint management plan has been agreed upon and is being implemented, which should ensure maintenance of the special features.
Landowner/ Management Responsibility	Conwy County Borough Council
HRA/AA Studies undertaken that address this site	Not known

Special Protection Areas

Site Name: Ynys Feurig, Cemlyn Bay and The Skerries

- **Location: 043040W/ 532442 N**
- **SAC Code UK9013061**
- **Size: 85.66 ha**
- **Designation: SPA**

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
Site Description	The SPA of Ynys Feurig, Cemlyn Bay and The Skerries is located on the north and west coasts of the island of Anglesey off north-west Wales. The SPA comprises three separate areas:; Ynys Feurig lies on Anglesey's west coast close to Valley airfield; Cemlyn Bay is situated on the north coast about 20 km away; and The Skerries lies 3 km off Carmel Head. Ynys Feurig consists of a series of low-lying islands extending about 1 km out to sea from a sandy shore. There is little vegetation, except on the highest outer islands. Cemlyn Bay consists of a shingle storm beach forms a bar between a tidal lagoon and the open shore. The shingle habitats, together with saltmarsh developing around the lagoon and brackish pools further inland are an unusual combination of habitats. The Skerries are a group of sparsely vegetated islets, 17 ha in extent. They are protected by strong currents but are very exposed to strong westerly and northerly winds. The site is of importance for four species of breeding terns. The three separate areas are treated as a single site as a consequence of regular movement by birds between the component parts.
Qualifying Features	This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive:

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	During the breeding season; Arctic Tern *Sterna paradisaea*, 1,290 pairs representing at least 2.9% of the breeding population in Great Britain (5 year mean, 1992-1996) Common Tern *Sterna hirundo*, 189 pairs representing at least 1.5% of the breeding population in Great Britain (5 year mean, 1992-1996) Roseate Tern *Sterna dougallii*, 3 pairs representing at least 5.0% of the breeding population in Great Britain (5 year mean, 1992-1996) Sandwich Tern *Sterna sandvicensis*, 460 pairs representing at least 3.3% of the breeding population in Great Britain (5 year mean, 1993-1997)
Conservation Objectives	The interest features will be considered to be in favourable conservation status when, subject to natural processes, each of the following conditions are satisfied: **Interest Feature 1-4: Breeding population of Terns** • The number of breeding terns within the SPA is stable or increasing. • The number of chicks successfully fledged in the SPA and beyond is sufficient to help sustain the population. • The range and distribution of terns within the SPA and beyond is not constrained or hindered. • The extent of supporting habitats used by terns is stable or increasing. • Supporting habitats are of sufficient quality to support the requirements of terns. • There are appropriate and sufficient food sources for terns within access of the SPA. • Actions or events likely to impinge on the sustainability of the population are under control.

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
Component SSSIs	• Ynys Feurig SSSI • The Skerries SSSI • Cemlyn Bay SSSI Maps containing the component SSSIs can be viewed on the CCW website: http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/bae-cemlyn--cemlyn-bay-sac.aspx
Key Environmental Conditions (factors that maintain site integrity)	• Provision of alternative nest sites (boxes) • Predator control (Foxes and avian predators • Managing recreation (walking, climbing, canoeing cycling access) to prevent disturbance
SPA Condition Assessment	**Conservation status of Feature 1: Breeding population of Artic Terns: Favourable maintained.** **Conservation status of Feature 2: Breeding population of Common Terns: Favourable maintained.** **Conservation status of Feature 4: Breeding population of Sandwich Terns: Favourable maintained.** Provision of appropriate nest sites offered (open or exposed sites). **Conservation status of Feature 3: Breeding population of Roseate Terns: Unfavourable, unchanged.** Lack of appropriate nest sites (Roseate terns requiring to nest under some sort of protective cover such as rocks, vegetation, or when provided nest boxes).
Vulnerabilities (includes existing pressures and trends)	These three isolated locations are used at various times as breeding sites by the Irish Sea Roseate Tern populations, though may be deserted for a period of years while other sites are more favoured, for reasons unknown. Currently Rockabill Island in Dunlin Bay is the favoured breeding location.

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	The three islands within the SPA continue to support important colonies of Arctic, Common and Sandwich Terns. Recreational pressures at Cemlyn arise from the promotion of the coastal footpath which passes close to the colonies and requires 24 hour wardening to guide the public below the skyline. Other colonies suffer occasional disturbance from inadvertent public access, requiring constant wardening. Ground predators (Stoat *Mustela erminea* and Fox *Vulpes vulpes*) require regular control at Cemlyn Bay and Ynys Feurig. Peregrine falcons *Falco peregrinus* and rogue gulls have caused mortality and desertion of colonies on some occasions. Theft of eggs by collectors continues to be a threat. Close co-operation, research and monitoring of the Irish Sea Roseate Tern population is maintained through the Interreg Programme. Roseate Terns spend much of their lifespan away from breeding colonies and are vulnerable to pressures beyond the control of the site managers, including factors such as affecting food supply and winter survival. The Sandwich Tern is particularly vulnerable to human disturbance (from tourists for example), especially near breeding colonies on beaches early in the breeding season. It is threatened by the loss or degradation of its favoured breeding habitats through inundation, wind-blown sand and erosion, and has suffered previous local declines as a result of exposure to bio-accumulated organochlorine pollutants in marine fish. During the breeding season the Common Tern is vulnerable to human disturbance at nesting colonies (for instance, from off-road vehicles, recreation, motor-boats, personal watercraft and dogs), and to the flooding of nest sites as a result of naturally fluctuating water levels. On its breeding grounds the species is also threatened by habitat loss as a result of coastal development, erosion, vegetation overgrowth (rapid vegetation succession encroaching upon nesting habitats) and chemical pollution (which may also result in eggshell thinning). It suffers predation at nesting

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	colonies from rats (especially on islands) and from expanding populations of large gull species such as Herring Gulls *Larus argentatus* (gulls may also prevent the species from nesting in the area by colonising it first).
Landowner/ Management Responsibility	National Trust/CCW/North Wales Wildlife Trust
HRA/AA Studies undertaken that address this site	HRA and AA of the Wales Spatial Plan Update June 2008. http://wales.gov.uk/about/strategy/spatial/hra/download/?lang=en • The HRA Screening concludes that the WSPU and other plans have the potential to give rise to adverse effects at this site. The AA states that it is not possible to predict in specific terms whether the WSPU would or would not give rise to significant adverse effects either alone or in combination with other plans/ strategies and projects upon specific European sites. However, it does identify that this site is likely to come under increasing risk of adverse in combination effects from transport infrastructure, urban and economic development and recreation and tourism as a result of the WSPU and English RSSs. The AA also identifies that in combination with the English RSSs the WSPU has the potential to have negative effects on water levels, flood protection and water quality issues, which could affect this site.

Site Name: Glannau Ynys Gybi / Holy Island Coast

- **Location: 53 18 07 N/ 04 41 21 W**
- **JNCC Site Code: UK9013101**
- **Size: 352.59 ha**
- **Designation: SPA**

	Glannau Ynys Gybi / Holy Island Coast SPA
Site Description	The SPA of Glannau Ynys Gybi / Holy Island Coast is located on the west coast of Holy Island which lies to the west of the island of Anglesey in North Wales. The site consists of sea-cliffs with cliff-top heath and maritime grassland communities comprising endemic and nationally rare species. The cliffs are formed from geologically complex and greatly folded strata comprising grits and sandstones with interbedded shales. There are many small offshore stacks and islets. The maritime heath is dominated by Heather *Calluna vulgaris*, Bell Heather *Erica cinerea* and Western Gorse *Ulex gallii* and is exposed to strong westerly winds. The site supports a resident population of Chough *Pyrrhocorax pyrrhocorax,* which depend on the diverse mix of habitats and their low-intensity agricultural management. Peregrine falcon *Falco peregrinus* are also known to breed here.
Qualifying Features	Article 4.1 Qualification Over winter the area regularly supports: • Chough *Pyrrhocorax pyrrhocorax* During the breeding season the area regularly supports: • Chough *Pyrrhocorax pyrrhocorax*
Conservation Objectives	The following interest features will be considered to be in favourable condition when, subject to natural processes, the following conditions are met: **Interest Feature 7: Chough** • The natural range and areas this species covers within that range are stable or increasing, and the

	Glannau Ynys Gybi / Holy Island Coast SPA
	specific structures and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future • The breeding population of Chough within the SPA is at least 18 pairs, of which at least 12 should be within the Glannau Ynys Gybi / Tre Wilmot SSSI and at least 6 should be within the Glannau Rhoscolyn SSSI. • The non-breeding population of Chough is at least 18 individuals or 2.5 % of the GB wintering population. • Sufficient suitable habitat (including Atlantic sea cliffs, maritime grassland, maritime heath, wet heath and dry heath) is present and in appropriate condition to support the breeding populations. The performance indicators can be found within the Glannau Ynys Gybi SAC and SPA Core Management Plan.
Component SSSIs	• Glannau Ynys Gybi Site of SSSI • Tre Wilmot SSSI • Glannau Rhoscolyn SSSI Maps containing the component SSSIs can be viewed on the CCW website
Key Environmental Conditions (factors that maintain site integrity)	**Key supporting habitat for the Annex I species:** Short unimproved turf that provides accessibility to soil invertebrates is vital to support chough. Appropriate grazing levels should be maintained; this may be higher than normally required for heathland maintenance and a programme of heavier grazing with periods of recovery, on a patchwork pattern, may be required. Livestock should be out-wintered. Animal dung is also an important resource for

	Glannau Ynys Gybi / Holy Island Coast SPA
	many insects (and fungi) and for the animals that feed upon them such as the chough. Avoidance of Avermectin type veterinary products, especially the long lasting bolus type application, enables this natural breakdown of dung. Cloddiau (stone hedges) are also important feeding sites. Grazing animals should have access to the cloddiau so that vegetation is grazed and kept short. Bank top fencing should be used rather than basal fencing. **Key environmental conditions for the supporting habitats:** **Grazing -** Light grazing should be maintained to remove excess herbage, encourage the maintenance and development of dwarf shrub heath and control the development of scrub. Grazing should be mainly concentrated between May and September, as heavy autumn grazing can destroy heather. Grazing cattle help to maintain the dwarf shrub heathland within which the marsh gentian grows. Cattle and/or horses are preferable to sheep, since they are less selective in their grazing habits and therefore allow plants to set seed. No sheep should be used during the flowering season from July through September, as nationally rare species such as the Spotted rock rose *Tuberaria guttata* are susceptible to this. Cattle also help to break up clumps of gorse by trampling and keep edges of pools open; the minor poaching and open paths created by cattle are amongst areas where marsh gentian flowers most freely and other seedlings can establish. Poached areas on pool edges are favoured by Pillwort *Pilularia globulifera* and the Three lobed water crowfoot *Ranunculus tripartitus.* **Burning -** This site has traditionally been burnt as a management tool. Burning can rejuvenate heathland and creates opportunities for germination of marsh gentians. However, over-frequent burning impoverishes the invertebrate fauna and encourages Gorse *Ulex europaeus* and Purple moor-grass *Molinia caerulea*. It should be used as a tool to encourage correct grazing, not as a primary tool to control the vegetation. No more than a tenth of the heathland area should be burnt annually, following the Grass and Moor Burning Regulations. Fire-breaks should be established.

	Glannau Ynys Gybi / Holy Island Coast SPA
	Care should be taken to avoid burning wet heath where mosses could be scorched and killed. To avoid bracken invasion following burning grazing must be maintained, particularly on deeper soils. Controlled burning reduces the risk of large accidental burns, which can devastate large areas f heathland and grassland. Burning on this site needs to be undertaken with extreme caution. **Low soil fertility -** No fertilisers of any kind should be applied. Low soil fertility helps Heather and Western gorse to compete against more aggressive agricultural grasses. The application of any fertiliser or slurry should be avoided and animals should not be fed with silage on the site. **Scrub control -** Small patches of scrub should be tolerated on site since they provide shelter and nest sites for a variety of insects, birds and other animals. If burning and grazing are unsuccessful in limiting scrub distribution it may be necessary to cut back European gorse, birch and willow to prevent it encroaching on the heathland areas. Scrub control should be done on a rotational small scale basis followed by grazing and should aim to restore the area of heathland, to control invasive European gorse and to stop wetter areas drying up. Cutting scrub and bruising bracken (or trampling with heavy stock in late spring) is preferable to using chemicals, although stump treatment with chemicals may be the best method of ensuring the roots are killed. **Public access and activities –** Significant disturbance attributable to human activities can result in displacement from foraging, roosting and breeding sites of Chough and other bird species, leading to reduced food intake and/or increased energy expenditure.
SPA Condition Assessment	**Conservation Status and Management Requirements of Feature 7: Chough** **Unfavourable declining** despite the steady increase in breeding numbers over the past 30 years, as the utilisation of land within the SPA – notably heathand areas – by feeding birds appears to have diminished. Thus the SPA does not provide the support necessary to the breeding population and

	Glannau Ynys Gybi / Holy Island Coast SPA
	birds fly to adjacent farmland to feed. Specific factors include the scarcity of bare-ground, development of grass mat, absence of animal dung and associated invertebrate fauna and the use of anti-helminthic veterinary preparations which prevent the development of dung fauna. Condition status for component SSSIs currently unavailable.
Vulnerabilities (includes existing pressures and trends)	Holy Island Coast is a spectacular coastal heath and cliff site, with ornithological, botanical and geological interest. Part of the designated site is an RSPB reserve. However, given that much of the site is declared statutory access land, there are heavy recreational pressures which require careful management. This is partly achieved by a policy of restricting parking spaces and a long standing voluntary ban on climbing in key areas during the nesting season. Chough breeding numbers have increased in the reserve in recent years partly due to control of disturbance. However, winter survival of chough appears to be low and the regional chough population is stubbornly static despite good fledging success. This is being addressed through research programmes but may be dependent on wider regional land management factors. The heathland habitat (away from the cliff top) is dependent upon periodic fires, which are carried out in a controlled (and sometimes uncontrolled) manner and partly on maintaining traditional pastoral practices.
Landowner/ Management Responsibility	• Isle of Anglesey/CCW
HRA/AA Studies undertaken that address this site	• Refer to Glannau Ynys Gybi / Holy Island Coast SAC

Site Name: Traeth Lafan / Lavan Sands, Conway Bay

- **Location: 53 15 18 N/ 04 02 31 W**
- **SPA EU Code UK0913031**
- **Size: 2642.98 ha**
- **Designation:** SPA

	Traeth Lafan / Lavan Sands SPA
Site Description	Traeth Lafan / Lavan Sands is located in Conway Bay close to Bangor in north-west Wales. It is a large intertidal area of sand- and mud-flats lying at the eastern edge of the Menai Straits. The area has a range of exposures and a diversity of conditions, enhanced by freshwater streams that flow across the flats. The site is of importance for wintering waterbirds, especially Oystercatcher *Haematopus ostralegus*. In conditions of severe winter weather, Traeth Lafan acts as a refuge area for Oystercatchers displaced from the nearby Dee Estuary.
Qualifying Features	This site qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: **Over winter;** Oystercatcher *Haematopus ostralegus*, 4,931 individuals representing at least 0.5% of the wintering Europe and Northern/Western Africa population (5 year peak mean 1991/2 - 1995/6)
Conservation Objectives	**Oystercatcher (*Haematopus ostralegus*)** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: 1. The 5 year mean peak of the number of wintering oystercatchers is at least 4,000. 2. The abundance and distribution of cockles of 15mm or larger and other suitable food are

	Traeth Lafan / Lavan Sands SPA
	maintained at levels sufficient to support the population with a 5 year mean peak of 4,000 individuals. 3. Oystercatchers are not disturbed in ways that prevent them spending enough time feeding for survival. 4. Roost sites, including high tide roost sites, remain suitable for oystercatchers to roost undisturbed. 5. The management and control of activities or operations likely to adversely affect the oystercatchers, is appropriate for maintaining the feature in favourable condition and is secure in the long term.
Component SSSIs	Traeth Lafan SSSI
Key Environmental Conditions (factors that maintain site integrity)	The following factors need to be maintained to ensure no impacts to the integrity of this SPA: • The extent of intertidal flats and the broad-scale spatial distribution of their constituent sediment and community types is maintained • The abundance and distribution of cockles => 15mm are maintained at levels sufficient to support the population at 4,000 individuals. • Disturbance of roosting or feeding oystercatcher is not significant • High tide roost sites do not deteriorate in habitat quality and suitability for birds.
SPC Condition Assessment	**Oystercatcher (*Haematopus ostralegus*) : Favourable** The most recent five-year peak mean from 2004/2005 is at 6,971 birds that is above the lower limit of 4,000 (Banks et al, 2006). The extent of intertidal flats and the broad-scale spatial distribution of

	Traeth Lafan / Lavan Sands SPA
	their constituent sediment and community types have been maintained, as well as the abundance and distribution of oystercatcher prey species. This is ascertained due to the good level of birds, which are utilising the site. It also would appear that the birds have not been disturbed significantly; otherwise a reduction in population may well have occurred.
Vulnerabilities (includes existing pressures and trends)	**Disturbance** The main risk to the population of oystercatchers at Traeth Lafan arises from human disturbance associated with the cockle fishery. CCW and other partners are actively working with the North West and North Wales Sea Fisheries Committee to ensure that any cockling is undertaken in a sustainable manner and in a way which does not cause unacceptable disturbance or loss of food resource to oystercatchers and other waders. Disturbance from increased or new types of recreation for example wind kites, small hovercraft etc could potentially threaten the oystercatchers but is mostly confined to the summer months and less likely to occur in the winter when they are roosting on Traeth Lafan. Management of the landward fringe of the site with appropriate birdwatching hides and public access is required given that these areas provide some suitable high tide roosts. However there is open access to the shore and localised disturbance from people and their dogs is difficult (or impossible) to control. Some of the high tide roosts are in fields close to the shore outside the SPA and LNR and it is important that these roosts are not subjected to excessive disturbance, particularly in periods of severe weather when the birds' energy reserves are low. **Food Supply** There have been concerns that the sporadic cockle suction-dredging may deplete oystercatchers' food source.CCW have developed a protocol with the North Wales Sea Fisheries Committee (NWSFC) to allow an assessment of applications for licences to harvest cockles. NWSFC will now only invite applications for licences if cockle stocks are considered to be relatively high. CCW is commissioning research to quantifycockle stocks in relation to their depletion by foraging

	Traeth Lafan / Lavan Sands SPA
	oystercatchers. **Habitat Degredaton** High tide roosting sites are characterised by having good sightlines (i.e. open spaces where the birds can see any potential predators). Any significant increase in grass height through cessation of grazing, in hedge height or changes by means of tree planting or installation of tall structures could impact on the roosts and consequently the oystercatcher population. This should be considered in assessing any plans or projects close to the shore.
Landowner/ Management Responsibility	Cyngor Gwynedd Council Cyngor Bwrdeistref Sirol Conwy/ Conwy County Borough Council
HRA/AA Studies undertaken that address this site	Not known

Site Name: Ynys Seiriol / Puffin Island

- **Location: approx. latitude 53 31 69 N, longitude 04 02 54 W**
- **SPA EU Code UK9020285**
- **Size: Unknown**
- **Designation: SPA**

	Ynys Seiriol / Puffin Island SPA
Site Description	Ynys Seiriol / Puffin Island is located just off the eastern tip of the Isle of Anglesey in North Wales. It is a Carboniferous limestone block rising to 55 m with steep cliffs on all sides. A veneer of heavily guano-enriched soil masks the limestone over much of the surface, leading to an impoverished vegetation dominated by a dense mat of grasses (mainly Red Fescue Festuca rubra and Cock's-foot Dactylis glomerata), Common Nettle Urtica dioica, Bramble Rubus fruticosus and Alexanders Smyrnium olusatrum. It was heavily grazed by rabbits until the advent of myxomatosis. Dense woodland of Elder Sambucus nigra has developed, particularly in the past 40 years since the loss of rabbit grazing. The island has long been unoccupied. A large population of Common Rat Rattus norvegicus appears to have been eradicated by poisoning undertaken in 1998 to enhance its value for breeding seabirds. The site is of European importance for its breeding population of Cormorant Phalacrocorax carbo, which feed in the surrounding waters outside the SPA.
Qualifying Features	This site qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: **During the breeding season;** Cormorant *Phalacrocorax carbo*, 776 pairs representing at least 1.9% of the breeding Northwestern Europe population (count as at 1996)
Conservation Objectives	**Conservation Objective for Feature 1:** Breeding population of cormorant *Phalacrocorax carbo*

	Ynys Seiriol / Puffin Island SPA
	The conservation objective for the Cormorant is to achieve and maintain favourable conservation status, in which all the following conditions are satisfied: • The numbers of breeding cormorants within the SPA are stable or increasing. • The abundance and distribution of prey species are sufficient to support this number of breeding pairs and for successful breeding. • The management and control of activities or operations likely to adversely affect the Cormorants, is appropriate for maintaining the feature in favourable condition and is secure in the long term."
Component SSSIs	Puffin Island – Ynys Seiriol SSSI (Seaward boundary of SSSI and SPA is drawn to Mean Low Tide.)
Key Environmental Conditions (factors that maintain site integrity)	• Provision of nest sites through the management and maintenance of habitats such as sea cliffs, maritime grassland and intertidal rocks • Predator control (rats, cats and avian predators) • Managing recreation (fishing, walking, climbing, canoeing, cycling access) to prevent disturbance
SPC Condition Assessment	**Breeding population of cormorant *Phalacrocorax carbo*:** The population of breeding cormorant is believed to be in a favourable state, based on current monitoring records in relation to the overall European Population.
Vulnerabilities (includes existing pressures and trends)	**Disturbance** Breeding seabirds require secure nesting sites, free from human disturbance. Visits to the island should be controlled during the nesting season (February to July inclusive) and any visits necessary should seek to avoid disturbance to sensitive areas, particularly nesting cliffs. No dogs (except guide-dogs) or cats should be permitted at any time. **Fishing** Non-sustainable exploitation of fishing stocks within the cormorants' feeding range during the breeding season can have a negative effect on breeding success and adequate recruitment of

	Ynys Seiriol / Puffin Island SPA
	fledglings. Presence of fishing nets, especially fixed nets, close to the colony carries risk to foraging birds. **Predation** Breeding seabirds require freedom from ground predators to thrive. Small offshore islands should be naturally ground predator-free. Rats, cats or other ground predators can decimate breeding colonies. Although cormorants appear to have thrived alongside brown rats until their eradication in 1998, other seabirds appear to have been confined to marginal habitat. Every effort should be made to avoid introduction and to eradicate any ground predators present. Avian predators such as peregrine or greater black-backed gulls should be tolerated. **Invasive Species** The expansion of the elderwood may be inimical to further expansion of the seabird numbers. Consideration is being given to the reintroduction of grazing animals to control the vegetation.
Landowner/ Management Responsibility	Cyngor Sir Ynys Môn/ Isle of Anglesey Council
HRA/AA Studies undertaken that address this site	Not known

Site Name: Liverpool Bay SPA

- **Location: 53 21 24 N/03 42 25 W**
- **SPA EU Code N/A**
- **Size: 197,594.24 ha**
- **Designation: SPA**

	Liverpool Bay SPA
Site Description	Liverpool Bay SPA extends from Moelfre in North-East Anglesey to Rossall Point near Fleetwood. The entire site lies within the 12-mile limit and landward extends to the Mean Low Water Mark, except where it abuts existing SPA (Mersey Narrows, North Wirral Foreshore and Dee Estuary). At the mouth of the River Mersey, the SPA boundary follows a straight line from Fort Perch Rock lighthouse to the sea wall at Seaforth Nature Reserve. English Nature has identified two bird species whose use of Liverpool Bay represents over 1% of the GB populations (the trigger level for SPA set in Annex I of the EC Birds Directive). The Bay supports 28.7% of the GB population of Red-throated diver (*Gavia stellata*) and 3.3% of the migratory population of Common scoter (*Melanitta nigra*). In addition, the site regularly supports more than 20,000 wildfowl during the non-breeding season. Because water levels within the SPA are generally within the 20m-depth contour and tidal currents are generally weak, there is deposition of sediments, encouraging mud and sand belts to accumulate. This provides both good feeding grounds for the qualifying species and also commercial fisheries. The SPA designation process includes a two-stage analysis of the qualifying species threshold of 1% or more of GB population, 1% or more of regularly occurring migratory species and area used by over 20,000 waterfowl or seabirds in any season. The second stage provides more detail on the use

	Liverpool Bay SPA
	of the site by those qualifying species. The current consultation is informal, to establish the likely key stakeholders and interested parties.
Qualifying Features	28.7% of the GB population of Red-throated diver (*Gavia stellata*) Annex I species 3.3% of the migratory population of Common scoter (*Melanitta nigra*) Annex 2.2 Species
Conservation Objectives	Whilst Natural England/CCW English Nature has not supplied a draft designation document for the SPA, the conservation objectives supplied for the Mersey Estuary lists the attributes and features required to be maintained so as to maintain favorable conditions for the qualifying species.
Component SSSIs	None given
Key Environmental Conditions (factors that maintain site integrity)	**Feeding grounds for the qualifying species** 20m-depth contour Generally weak tidal currents Accumulations of mud and sand belts. Limited potentially disturbing activities such as noise or lighting
SPC Condition Assessment	None given
Vulnerabilities (includes existing pressures and trends)	Existing pressures and trends include commercial interests in Liverpool Bay, particularly off the Wirral coast. The SPA is bisected by the channel to the Port of Liverpool and also contains a number of windfarms and oil and gas platforms. Categories of operations, which may cause deterioration or disturbance, includes • coast protection and sea defences, • power generation, • sediment extraction,

	Liverpool Bay SPA
	• transport and communication • noise or visual disturbance such as lighting
Landowner/ Management Responsibility	Unknown
HRA/AA Studies undertaken that address this site	**Oil and Gas Exploration in Welsh Waters** During 2006 the DTI carried out an appropriate assessment (AA) to see if there is likely to be a significant effect on the integrity of European sites associated with licensing for oil and gas exploration in Welsh waters (Cardigan Bay and off the north coast of Wales). The DTI began consultation on a draft AA of the 24th Licensing Round in November 2006. In commenting on a draft version of the AA, CCW agreed with the DTI that many of the effects of oil and gas activities that may arise subsequent to the licensing of oil and gas blocks would be mitigated by the existence of a robust regime for assessing the project-specific impacts. However, CCW did not agree with the DTI's overall conclusion that the draft AA had established with sufficient robustness or certainty that the plan would not have an adverse effect on the integrity of any European Site or potential European Sites because of concerns about: 1. An apparent presumption created by the plan in favour of subsequent oil and gas project activities, and the influence of the plan on consenting of subsequent projects. 2. The absence of any specific consenting mechanism for seismic survey works in territorial and internal waters. 3. Important omissions from the AA in relation to potential European Sites, and certain weaknesses in the assessment of potential impacts. The DTI has now revised and finalised the AA making it clear that subsequent oil and gas activity will be subject to the necessary environmental assessment procedures. In addition, legislation has been amended to ensure that seismic survey work is subject to a consenting process within the 12 nautical mile territorial waters limit. The Dee Estuary pSAC and **Liverpool Bay SPA**, absent from

	Liverpool Bay SPA
	the earlier draft, have also now been included in the assessment. **FOOD AND ENVIRONMENT PROTECTION ACT 1985 (AS AMENDED)** **LICENCE TO UNDERTAKE CONSTRUCTION WORKS (REF 32987/07/0)** **CONSTRUCTION OF THE ORMONDE OFFSHORE WIND FARM OFF BARROW-IN-FURNESS.** Liverpool Bay Special Protection Areas – Appropriate Assessment Natural England advised Competent Authorities that an Appropriate Assessment was required to determine the potential impacts that the proposed wind farm would have on the Liverpool Bay Special Protection Areas (SPA) under the Wild Birds Directive along with the Duddon Estuary, Morecambe Bay Ribble and Alt Estuaries and Martin Mere SPAs. It is also noted that these sites are RAMSAR designated sites. Natural England advised that the development could have a significant adverse impact on the mortality of pink-footed goose, whooper swan and lesser black-backed gull through collisions with the turbines or increased energetic costs due to barrier effect. Potential impacts on a cobble skear feature at the landfall site, which is a designated site within Morecambe Bay SAC, were also assessed. Other Special Areas of Conservation (SAC) and SPAs also exist in the area, but Natural England have considered that an Appropriate Assessment for these sites was not required. Based on the information available and agreed mitigation measures, it was concluded that the proposed development of the Ormonde offshore wind farm will not have an adverse effect on the integrity of the designated European Sites: Duddon Estuary, Morecambe Bay, Ribble and Alt Estuaries and Martin Mere, either alone or in combination with other plans or projects.

	Liverpool Bay SPA
	Seaforth river terminal harbour Appropriate Assessment The Environmental Statement provided with the application identifies a number of proposed and existing nature conservation sites of European and international importance which would or would be likely to be affected by the project which the Order would authorise. These are the Sefton Coast Special Area of Conservation, the Mersey Estuary Special Protection Area and the Mersey Estuary Ramsar site, the Mersey Narrows and North Wirral Foreshore Special Protection Area (SPA) and proposed Ramsar site, the Ribble and Alt Estuaries pSPA and proposed Ramsar site, and the **Liverpool Bay Marine SPA**. The project would also affect or be likely to affect a number of sites of national conservation importance coterminous with the afore-mentioned European and international sites. The Secretary of State notes that, with the exception of the Liverpool Bay Marine SPA, none of the existing and proposed sites of European and international nature conservation significance would be directly affected by the scheme which the Order would authorise. However, it is likely there would be indirect adverse impacts on the sites concerning, in particular, sediment accretion and erosion. With regard to Liverpool Bay Marine SPA the impacts relate to the dredging of a relatively small area for the berths and the approach channel for the river terminal which does not alter the reasons (importance to wild birds) for which the SPA has been classified. The Secretary of State concludes that the project will not adversely affect the integrity of the relevant nature conservation sites.

Ramsar Sites

Site Name: Corsydd Môn a Llyn / Anglesey and Llyn Fens

- **Location: 53 18 45 N/04 17 44 W**
- **JNCC Site Code: UK14005**
- **Size: 624.9 ha**
- **Designation: Ramsar**

	Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar
Site Description	• Corsydd Mon comprises a series of fen basins located on the limestone of eastern Anglesey. Several of the sites (Cors Goch, Cors y Farl, Cors Erddreiniog, Cors Bodeilio) occupy former lake basins which have gradually infilled with clay, marl and peat sediments. These sites and others (Waun Eurad, Caeau Talwrn, Gwenfro - Rhos y Gad) also contain areas of flush mire where calcareous springs irrigate the surface. The site includes some of the best examples of base-rich fen (Alkaline fen and Calcareous fen) in Wales along with oligotrophic (nutrient poor) lakes, areas of Purple moor-grass (*Molinia caerulea*) meadow, wet and dry heath and associated areas of neutral and calcareous grassland. The sites support many species including Geyer's whorl snail *Vertigo geyeri*, Southern damselfly *Ceonagrion mercuriale*, Marsh fritillary *Euphydryas* (*Eurodryas, Hypodryas) aurinia*, Great crested newt *Triturus cristatus* and Otter *Lutra lutra*. The component sites are set within a mainly agricultural landscape of livestock farms and small settlements. Refer to Corsydd Môn a Llyn / Anglesey SAC for further details.
Qualifying Features	**Ramsar criterion 1** • Hard oligo-mesotrophic waters with benthic vegetation of *Chara sp.* • Northern Atlantic wet heaths with *Erica tetralix*

	Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar
	• Molinia meadows on calcareous, peaty or clayey— silt-laden soils (*Molinion caeruleae)* • Calcareous fens with *Cladium mariscus* and species of the *Caricion davallinae* • Alkaline fens • Geyer's Whorl Snail • Southern damselfly • Marsh fritillary butterfly **Ramsar Criterion 3** The site supports a diverse flora and fauna with associated rare species and is of special value for maintaining the genetic and ecological diversity of the region. Noteworthy flora include: Higher plants: • *Dactylorhiza traunsteineri* • *Eriophorum gracile* Lower plants*:* • *Nitella tenuissima* Noteworthy fauna include: Invertebrates: • Geyer's whorl snail (Habitats Directive Annex II) • Desmoulin's whorl snail *Vertigo moulinsiana* (Annex II (Habitats Directive; RDB3) • Southern damselfly *Coenagrion mercuriale* (Habitats Directive Annex II) • Marsh fritillary (Habitats Directive Annex II) • Ground beetle *Chlaenius tristis* (RDB1) • Hornet robber fly *Asilus crabroniformis* (Notable)

	Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar
	• Solder fly *Stratiomys chamaeleon*, Parasitic fly *Acrometopia wahlbergi*, Medicinal leech *Hirudo medicinalis* (Habitats Directive Annex V) Mammals: • Otter *Lutra lutra* (Habitats Directive Annex II)
Conservation Objectives	• Refer to Anglesey Fens SAC
Component SSSIs	• Cors Erddreiniog SSSI • Cors Goch SSSI • Cors y Farl SSSI • Cors Bodeilio SSSI Condition status for component SSSIs currently unavailable.
Key Environmental Conditions (factors that maintain site integrity)	• Refer to Anglesey Fens SAC
Ramsar Condition Assessment	N/A
Vulnerabilities (includes existing pressures and trends)	• Refer to Anglesey Fens SAC
Landowner/ Management Responsibility	• Isle of Anglesey/CCW
HRA/AA Studies undertaken that address this site	**HRA of the Gwynedd Unitary Development Plan (UDP),** Gwynedd Council (June 2008, Hyder Consulting) The proposals and policies within the UDP have the potential to impact upon Gwynedd's built and natural environment including sites protected at a European level for their nature conservation characteristics. However the HRA screening process concluded that the Gwynedd Unitary

	Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar
	Development Plan 2008, alone or in combination with other plans or projects, would not adversely affect the integrity of the Anglesey and Llyn Fens Ramsar site. No appropriate assessment was therefore undertaken.

Appendix 2: Plans and Programmes Review

National

Plan	Potential impacts that could cause 'in-combination' effects
People, Places, Futures: The Wales Spatial Plan (update) 2008, Adopted 2004	• Housing and employment growth may lead to increased transport movements - the potential for in-combination effect is greater where housing sites are in close proximity to Natura 2000 sites. • New communities require increased infrastructure – potential for land take, pollution increase, disturbance/ severance of habitats and species. • Growth in the requirement for waste management/ transport disposal from new communities and businesses has the potential to increase pollution, and introduce land take issues. • Recreation pressures may result from housing developments near/ adjacent to Natura 2000 sites. • Atmospheric pollution generated as a result of housing, employment and transport growth.
Welsh Coastal Tourism Strategy Draft Final Strategy Document 2007	• Direct loss of habitat through development – Menai Straits and Conwy Bay SAC could potentially be affected. • Increased levels of tourism and employment may lead to increased transport movements. • Atmospheric pollution generated as a result of employment and transport growth. • Increased recreational pressure through water sports.

	• An increased level of waterborne transport and development along the coast has the potential to increase diffuse levels of water pollution.
'Catching the Wave' - A watersports tourism strategy for Wales 2004-2010	• Increased recreational pressure on the Conwy Bay/Menai Straits SAC. • An increased level of watersports has the potential to increase diffuse levels of water pollution. • There is also the potential of increased levels of disturbance on nesting/ roosting birds.
Minerals Planning Policy Wales 2001	• No locations are specified. The document contains strong policies in regard to the protection of Natura 2000 and Ramsar sites.
River Basin Management Plan: Western Wales River Basin District:	This plan describes how the region will meet the challenge of the Water Framework Directive to improve the quality of every aspect of the water environment in Western Wales. The plan proposes new actions to manage the water environment in the Western Wales river basin district. The key targets of the plan are: • By 2015, 13% of surface waters (rivers, lakes, estuaries and coastal waters) will improve for at least one element • By 2015, 36% of surface waters will be at good or better ecological status/potential • By 2015, 59% of surface waters will be at good or better biological status/potential • For the 132 artificial and heavily modified water bodies, 35% will be in at least good ecological potential in 2015, compared to 36%

	of 657 natural surface water bodies at good or better ecological status • For groundwater by 2015, there will be a 96% compliance for quantitative and 64% compliance for chemical status • At least 36% of assessed surface waters will be at good or better biological status by 2015 The following challenges are addressed in the plan: • diffuse pollution from agricultural activities • acidification from forestry activities • diffuse and point source pollution from disused mines ●
Dwr Cymru Welsh Water Draft Water Resources Management Plan 2008	Outlines 25 year water resource strategy for managing water resources across the supply area and maintaining balance between supply and demand. Wylfa falls within the North Eryri- Ynys Mon zone – an area that has been identified as being in deficit (where demand is exceeding or forcecast to exceed supply). Strategies to resolve this could impact on Natura 2000 sites which are dependent on water resources. HRA of the plan identifies the following European Sites as being potentially vulnerable to implementation of the plan: Anglesey and Llyn Fens Ramsar Menai Strait and Conwy Bay SAC Abermenai to Aberffraw Dunes SAC Afon Gwyrfai a Llyn Cwellyn SAC Anglesey Coast and Saltmarsh SAC

Minerals and Waste Strategies

Plan	Potential impacts that could cause 'in-combination' effects
Gwynedd Structure Plan – Minerals, 1993. Isle of Anglesey County Council / Gwynedd County Council	The plan identifies the following potential impacts: • The impact on the national park, AONBs, heritage coast and landscape conservation areas. • The effect on features of archaeological, architectural and historic interest. • The effects on nearby towns, villages, communities and residents. • The traffic generated and its impact on the local highway network. • The demand for the proposed product and the location of other sources of supply. • The effect on local and county-wide employment. • The effects on farming activities. • The agricultural quality of the land concerned. • The potential effect on water resources. • The impact on areas of nature conservation interest.
YNYS MÔN DEPOSIT UNITARY DEVELOPMENT PLAN (STOPPED) – 2005 - Chapter 15 – Minerals and Waste. Isle of Anglesey County Council. Still to be used for guidance	• Land take could result in the direct loss of designated land or the indirect loss of important surrounding habitat. • Diffuse air pollution due to increased transport movements - can also affect water quality (eutrophication). • Dust, noise and odour associated with industrial processes - Some designated species are sensitive to disturbance, such as the Lesser Horseshoe Bat. • Contamination, accumulation of toxic substances - This can lead

	to a decrease in water and soil quality. • There is the potential for high concentrations of metals, dissolved nitrogen and organic material associated with certain waste and minerals development to contaminate water resources. • Impacts on surface water run-off due to change of topography could increase the risk of flooding. • Aggregates removal will have effects on groundwater flow and water quality

Transport Plans

Plan	Potential impacts that could cause 'in-combination' effects
Wales Transport Strategy 2008	Policies include: • Improving sustainable access to key visitor attractions • Reducing contribution of air pollution and other harmful emissions • Improving the impact of transport on biodiversity – biodiversity for both marine and land environments to be protected and enhanced when improving or developing transport measures. Although Natura 2000 sites will be a key consideration there could still be in combination effects. For example better transport links to key visitor attractions could lead to increased recreational pressure and disturbance at Natura 2000 sites.
Isle of Anglesey Local Transport Plan, 2000. Isle of Anglesey County Council	Within the context of a plan which proposes a more sustainable and integrated approach to transport, there is still the potential for adverse impacts including increased transport movements; dust/noise/odour associated with transport; landtake; impacts on surface water run-off; and construction such as laying pipes/cables.

Local Development Plans

Plan	Potential impacts that could cause 'in-combination' effects
The Ynys Môn (Anglesey) Local Plan, 1996. Isle of Anglesey County Council	Generic effects related to development/ growth scenarios include: • Potential for land take/ habitat fragmentation. • Increased demand for water resources/ abstraction/ hydrological impacts. • Increased traffic movements, contributions to atmospheric pollution loading. • Growth in requirements for waste management facilities, increased demand for minerals. • Increased recreational pressure from existing/ new populations. **SAC Specific Issues** • Potential to adversely affect the Menai Straits and Conwy Bay SAC.
Gwynedd Structure Plan, 1993. Isle of Anglesey and Gwynedd County Council	Generic effects related to development/ growth scenarios include: • Potential for land take/ habitat fragmentation. • Increased demand for water resources/ abstraction/ hydrological impacts. • Increased traffic movements, contributions to atmospheric pollution loading. • Growth in requirements for waste management facilities, increased demand for minerals. • Increased recreational pressure from existing/ new populations.

Plan	Potential impacts that could cause 'in-combination' effects
	SAC Specific Issues • Potential to adversely affect the Menai Straits and Conwy Bay SAC.
Stopped Unitary Development Plan (unadopted) December 2005, Isle of Anglesey County Council	Generic effects related to development/ growth scenarios include: • Potential for land take/ habitat fragmentation. • Increased demand for water resources/ abstraction/ hydrological impacts. • Increased traffic movements, contributions to atmospheric pollution loading. • Growth in requirements for waste management facilities, increased demand for minerals. • Increased recreational pressure from existing/ new populations. **SAC Specific Issues** • Potential to adversely affect the Menai Straits and Conwy Bay SAC.

River and Coastal Management Plans

Plan	Potential impacts that could cause 'in-combination' effects
• **Shoreline Management Plan (currently in revision (SMP2) and Floor Risk Management Strategy**	• The Ynsys Enli to Llandudno Shoreline Management Plan which determines coastal defence management and identifies sustainable long-term management policies for the coastline at Wylfa was not available for assessment. However there are likely to be in-combination effects with the proposed development at Wylfa with regards to impacts arising from coastal squeeze, should coastal and flood protection measures implemented either at the outset or during the lifetime of the new nuclear power station at Wylfa result in alterations to the coastline not accounted for within the Shoreline Management plan and Flood Risk Strategies adopted.

Other Plans and Programmes

Plan	Potential impacts that could cause 'in-combination' effects
Increasing the Economic Benefit of the Mon Menai Coast, 2007. Commissioned by Isle of Anglesey County Council	• Increased levels of tourism and employment may lead to increased transport movements. • Atmospheric pollution generated as a result of employment and transport growth. • Increased recreational pressure through water sports. • An increased level of waterborne transport and development along the coast has the potential to increase diffuse levels of water pollution. • Direct loss of habitat through development – Menai Straits and Conwy Bay SAC could potentially be affected.
Environment Agency Review of Consents	• No documentation regarding the coast of Anglesey has been made available from the Environment Agency at the time of this assessment. The Review of Consents process is a review of all permits and consents (such as discharge consents and abstraction licenses) granted prior to the enforcement of the Habitats Regulations to ensure that no adverse effects on the nature conservation interests on designated sites are likely to occur. The RoC process aims to be fully completed by 2010.
CCW 2002 Review of SPAs	• No documentation regarding the 2002 Review of SPAs has been made available from CCW at the time of this assessment. This document reviews those features of interest listed within SPAs and is currently being consulted on.

Appendix 3: Likely Significant Effect (LSE) Screening Table

SIGNIFICANT EFFECTS SCREENING (INCORPORATING IN-COMBINATION ASSESSMENT)

European sites within 20km of the nominated site

	Designation	Distance from nominated site[4]
Cemlyn Bay SAC	**SAC**	0.7km
Ynys Feurig, Cemlyn Bay and The Skerries	**SPA**	0.7km
Holy Island Coast	**SAC**	13.8km
Holy Island Coast	**SPA**	13.8km
Anglesey Fens	**SAC**	14.2km
Anglesey and Llyn Fens	**Ramsar**	14.2km
Llyn Dinam	**SAC**	14.8km
Menai Strait and Conwy Bay	**SAC**	15.6km
Liverpool Bay	**potential SPA**	14.5km

European sites outside 20km[5] of the nominated site

	Designation	Distance from nominated site

[4] Distance measured is from nearest site boundary.

[5] an additional eight European Sites which fall beyond 20km from the site are included within this report following consultation with relevant Statutory Consultees given their potential hydrological connections to the site.

	Designation	Distance from nominated site
Anglesey Coast Salt Marsh	**SAC**	24.3km
Glantraeth	**SAC**	26.3km
Abermenai to Aberffraw Dunes	**SAC**	26.3km
Puffin Island	**SPA**	30.2km
Lavan Sands, Conway Bay	**SPA**	29.8km
Snowdonia	**SAC**	34.3km
Afon Gwyrfai a Llyn Cwellyn	**SAC**	34.7km
Great Orme's Head	**SAC**	39.2km

SIGNIFICANT EFFECTS SCREENING (INCORPORATING IN-COMBINATION ASSESSMENT): EUROPEAN SITES WITHIN/OUTSIDE A 20KM RADIUS OF THE NOMINATED SITE

European Sites Screened Out:

Holy Island Coast SPA

The SPA of Glannau Ynys Gybi / Holy Island Coast is located on the west coast of Holy Island which lies to the west of the Isle of Anglesey in North Wales. Nominated site at Wylfa lies over 15km away and is separated from this SPA by an almost estuarine shallow sea which lies between Holy Island and the Isle of Anglesey. This SPA is designated for it's over wintering and breeding populations of Chough *Pyrrhocorax pyrrhocorax* which depend upon the low-intensity agricultural management of the diverse mix of habitats present, including Atlantic sea cliffs, maritime grassland, maritime heath, wet heath and dry heath. Chough feed on invertebrates taken from or just below the surface and requires areas of short vegetation to do so, with populations predominantly residing within heathland but also within other habitats of Holy Island Coast SPA. Changes in water quality are therefore not likely to result in significant impacts upon this bird species given that their food source and habitat will unlikely be significantly impacted upon by any changes in groundwater levels resulting from abstraction or changes in the quality of discharge arising from the development. Given the distance of the SPA from Nominated site at Wylfa it is also considered unlikely for any significant effects to impact upon Chough through increased levels of disturbance or changes to air quality. Habitat loss and/ or fragmentation and impacts of coastal squeeze arising from the proposed development at the nominated site at Wylfa are also considered unlikely to affect this SPA due to its distance away and the nature of the sea cliffs supporting Chough at Holy Island Coast SPA being comprised of hard rock and therefore being resilient to minor changes to existing sediment transport regimes which may arise from the development.

Anglesey Coast Salt Marsh SAC

The Anglesey Coast SAC is located approximately 24Km to the south of the nomitated Site at Wylfa. The SAC is part of a complex of saltmarsh and sand dunes, including the Braint, Cefni and Ffraw estuaries, in the south west of Anglesey. Its qualifying interests include *Salicornia* and other annuals colonising mud and sand, and Atlantic salt meadows. These qualifying interests are under pressure from invasion by *Spartina anglica* on the seaward edges of the saltmarsh. This is largely due to drastic modification to the Cefni estuary in the early 19th century continues to cause rapid accretion of sediment. Any further changes to coastal processes

which increase sedimentation may exacerbate this problem. It is unlikely that development at nominated site at Wylfa would cause changes in coastal processes at the SAC due to the distance from site and the jagged morphology of the coastline between the two sites (the SAC is in the Grassholm Island and The Smalls water body unit, nominated site at Wylfa is on the boundary between The Skerries and Milford Havon Outer water body units). Salt marshes and mud flats are vulnerable to air pollution and poor water quality as toxins accumulate easily. Given the distance from the nominated site it is unlikely that water quality or air pollution will impact upon the SAC.

Glan-traeth SAC

Glan-traeth SAC is located in the south west of Anglesey, approximately 27Km south of nominated site at Wylfa. The primary qualifying feature is the significant Great Crested Newt population occupying water-filled depressions that have resulted from sand extraction from the dune system. The greatest risk to this population is the water table being lowered causing ponds to dry up resulting in habitat loss. Glan-traeth SAC is located within a separate groundwater body unit to nominated site at Wylfa, with several river water body catchment areas between the two sites also. It is therefore unlikely that the water table will be affected during the construction, operation or decommissioning of a nuclear power station at nominated site at Wylfa.

Snowdonia SAC

Snowdonia SAC is located 36km to the south-east of nominated site at Wylfa and covers 823 square miles of unspoilt countryside in North Wales. It is designated for a range of valuable habitats including oligotrophic.mesotrophic lakes and alpine/boreal grasslands. Despite being a well known tourist spot the SAC is vulnerable to increased recreational pressures, particularly trampling of habitats such as grasslands with thin soils. Development at nominated site at Wylfa will increase the local population but given the distance to Snowdonia and the variety of other recreational hot spots in the region it is unlikely that effects on the SAC would be significant. Although Snowdonia is vulnerable to acidification, given its distance from the nomination site and that impacts on air quality arising from development at the nominated site (increased development, traffic growth, emissions from cars) would be restricted to a local level, no significant effects upon this SAC are considered likely.

Great Orme's Head SAC

Great Orme's Head is located 41 km east of nominated site at Wylfa. The qualifying features for this SAC are dry heaths and semi-natural dry grasslands and scrubland facies. These habitats may be vulnerable to the effects of air pollution, particularly nitrogen containing substances which increase nutrient availability. However given that potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity would be restricted to a local level for example dust/ particulates

and given the proximity to the SAC, significant effects upon this SAC are considered unlikely. In addition, the semi-natural grasslands, dry heaths and sea-cliffs are vulnerable to disturbance, particularly trampling of thin soils, and recreational pressures are likely to increase due to an increased workforce. However given its distance from the nominated site it is considered unlikely that there will be significant effects upon this SAC arising from disturbance given the distance from Nominated site at Wylfa and the selection of other recreational attractions in the area.

Abermenai to Aberffraw Dunes SAC

Abermenia to Aberffraw Dunes SAC is located 28km south of the nominated site at Wylfa. Embryonic dunes form a zone across a broad part of the beach/dune interface, making this site one of the most extensive examples of this habitat type in the UK. It is a site where, in contrast to some others in north Wales, recreational damage is minimal. The SAC contains one of the largest areas of lyme-grass *Leymus arenarius* shifting dune community in Wales. Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], any increases in nutrient loading through discharge of synthetic and non-synthetic toxic compounds will be directed away from Abermenai to Aberffraw Dunes SAC. Significant effects upon this SAC are therefore considered unlikely.

Afon Gwyrfai and llyn Cwellyn SAC

Afon Gwyrfai and llyn Cwellyn SAC is located 36km south of nominated site at Wylfa, and comprises of Llyn Cwellyn, a large reservoir situated near to the village of Rhydd Du, situated on the Afon Gwyrfai. The reservoir provides drinking water to parts of Gwynedd and Anglesey, and is a glacial moraine lake formed during the last Ice Age now dammed at the northern end, near to the small village of Betws Garmon. Thi SAC is vulnerable to cumulative impact of small scale changes along its length which could affect water quality and habitat structure. Increases in abstraction and discharges may affect water quality and resources. However given that this SAC is located within a different ground water catchment unit to nominated site at Wylfa and is separated from Anglesey by the Menai Straits, impacts on water quality or resources arising from the nuclear development at Wylfa are unlikely. In addition, the Llyn Cwellyn lake is affected by acidification, partly due to acid rain. Decreases in local air quality (particularly increases in CO2 and SO2) are likely to further contribute to acidification. However given the distance of this SAC from the nominated site, impacts upon air quality arising from the development are not considered to have a significant effect upon this SAC.

1 North West England and North Wales Shoreline Management Plan: Appendix C: Baseline Process Understanding http://mycoastline.org/documents/overview1.pdf

Bae Cemlyn/Cemlyn Bay SAC

Authorities: Isle of Anglesey

Source: Construction (duration approx 5 years)

Bae Cemlyn/Cemlyn Bay SAC Construction (duration approx 5 years)	
Water Resources/Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the SAC: Receptor	Changes in organic, and nutrient discharge and changes in salinity in the catchment area can impact upon the lagoon communities which are sensitive to changes in water quality and nutrient loads, being a closed system.
Risk of Likely Significant Effect (LSE)?	Water quality, salinity and nutrient levels and are key environmental conditions required for the maintenance of the designated lagoon communities within the SAC site. Given the distance of the SAC from Nominated site at Wylfa the impacts upon water quality arising from construction need to be further assessed to determine any significant effects
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

Bae Cemlyn/Cemlyn Bay SAC Construction (duration approx 5 years)	
Water Resources/Quality	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Bae Cemlyn/Cemlyn Bay SAC Construction (duration approx 5 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example dust/ particulates.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading which can impact upon the lagoon communities within the SAC.
Risk of Likely Significant Effect (LSE)?	Air quality is a vulnerability for this SAC. Moreover given the distance of the SAC from the site (within 650m) the impacts of air quality arising from the construction stage of the development are likely to impact upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Bae Cemlyn/Cemlyn Bay SAC Construction (duration approx 5 years)	
Air Quality	
	Decommissioning of the existing nuclear power station at Wlyfa
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Bae Cemlyn/Cemlyn Bay SAC Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Construction of the power station and related infrastructure, extension of site into 'buffer' habitats. Possible development extending into the coastal fringes
Potential effects on the SAC: Receptor	Construction activities have the potential to result in the direct loss of terrestrial, marine and sub-tidal habitat and the ecological communities they support given the location of the proposed development on the coast.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site (within 650m) the impacts of loss and fragmentation of habitat and species arising from the construction stage of the development are likely to impact upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Bae Cemlyn/Cemlyn Bay SAC Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wlyfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Bae Cemlyn/Cemlyn Bay SAC Construction (duration approx 5 years)	
Coastal Squeeze	
Potential Impacts: Pathway	Construction of infrastructure and facilities relating to the operation of the nuclear power station may result in an encroachment upon land at the coastal fringes. All supporting habitats area sensitive to removal by land reclamation and construction activity.
Potential effects on the SAC: Receptor	The coastal lagoon is separated from the sea by a shingle bank with a narrow channel, therefore this coastal edge is particularly vulnerable to the physical loss of the shingle bank from changes in hydrology and/or sedimentation regimes. The ecological variation of perennial vegetation of stony banks relies on stability
Risk of Likely Significant Effect (LSE)?	The nominated Site lies approximately 650m from the SAC. The habitats and associated species within this SAC are vulnerable to physical loss or change to the structure of their supporting habitats or connected habitats affected further along the coastline
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss through development. **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. Local Development Plan (The Ynys Môn) - Land take through growth. Dwr Cymru Weslsh Water draft Water Resources Management Plan

Bae Cemlyn/Cemlyn Bay SAC Construction (duration approx 5 years)	
Coastal Squeeze	
	The CCW 2002 Review of SPAs Decommissioning of the existing nuclear power station at Wlyfa Ynsys Enli to Llandudno Shoreline Management Plan
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Source: Operation (duration approx 60 years)

Bae Cemlyn/Cemlyn Bay SAC Operation (duration approx 60 years)	
Water resources and Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
Potential effects on the SAC: Receptor	Changes in organic and nutrient loading, discharge of biocides used to clean cooling infrastructure, and increased water temperature of abstracted water returned to the sea can promote algal growth and directly impact upon the designated habitats of coastal lagoons and perennial vegetation of stony banks.
Risk of Likely Significant Effect (LSE)?	Potential for operation to effect changes to water quality and temperature to result in adverse effects on water quality need further investigation to determine whether changes are likely to be significant. Abstraction of water may result in impacts to hydrological regimes within this SAC, which could potentially alter the shingle bank which supports the lagoon
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Bae Cemlyn/Cemlyn Bay SAC Operation (duration approx 60 years)	
Water resources and Quality	
	Local Development Plan (The Ynys Môn) - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Bae Cemlyn/Cemlyn Bay SAC Operation (duration approx 60 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/traffic growth (nitrogen oxides, sulphur dioxide) are likely to be restricted to a local level for example. dust/ particulates. Potential impacts from planned (argon-41, krypton-85 and tritium,) and accidental radioactive emissions.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading and changes to water quality from aerial deposition. Indirect impacts include changes in water quality from aerial deposition. Changes in air quality can impact upon the lagoon, perennial vegetation of stony banks and associated species in these habitats.
Risk of Likely Significant Effect (LSE)?	The nominated Site lies very close to the SAC. The maintenance of good air quality is essential to protecting the ecological integrity of the SAC. As coastal lagoons are closed systems, they are vulnerable to changes in water quality. Accidental radioactive emissions are unlikely given the level of regulatory control. Risk of significant effects of this is therefore unlikely.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport.

Bae Cemlyn/Cemlyn Bay SAC Operation (duration approx 60 years)	
Air Quality	
	North Wales Regional Waste Plan – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wlyfa**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Bae Cemlyn/Cemlyn Bay SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to the footprint of the site through operation for example, to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
Potential effects on the SAC: Receptor	Construction activities arising from further expansions and maintenance of permanent infrastructure can result in a direct loss and fragmentation of terrestrial, marine and sub-tidal habitats given the location of the proposed development site on the coast.
Risk of Likely Significant Effect (LSE)?	The nominated Site lies close to the SAC. Any changes to the footprint of the site to accommodate further infrastructure will likely lead to the loss of supporting and buffer habitats, and potentially result in the loss or degradation of the qualifying habitats
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Bae Cemlyn/Cemlyn Bay SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
	Local Development Plan (The Ynys Môn) - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wlyfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Source: Decommissioning (duration approx 30 years)

Bae Cemlyn/Cemlyn Bay SAC Decommissioning (duration approx 30 years)	
Water resources/quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from deconstruction activities, earthworks, infrastructure and waste storage.
Potential effects on the SAC: Receptor	Changes in organic and nutrient loading can impact upon the composition of the featured habitats, and associated species within the SAC. Contamination by synthetic and non-synthetic compounds is potentially an issue for both coastal lagoons and perennial vegetation of stony banks. Lagoons are closed systems, which limits the diluting processes available in open waters.
Risk of Likely Significant Effect (LSE)?	The maintenance and stability of the water quality and existing hydrological and sedimentary regimes is crucial to maintain the coastal lagoon environment. As the SAC is approximately 650m from the nominated site, there is potential for significant effect at a local level
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

Bae Cemlyn/Cemlyn Bay SAC Decommissioning (duration approx 30 years)	
Water resources/quality	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Bae Cemlyn/Cemlyn Bay SAC Decommissioning (duration approx 30 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development and traffic growth associated with decommissioning and the emissions arising from deconstruction activity. Likely to be restricted to local levels for instance dust particulates.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading and changes in water quality from aerial deposition. Indirect impacts include changes to water quality from aerial deposition.
Risk of Likely Significant Effect (LSE)?	The nominated Site lies within 1km of the SAC. The maintenance of good air quality is essential in order to protect the ecological integrity of the SAC's sensitive habitats and associated species. Any potential effects of increased nutrient loading from airborne pollutants and their deposition upon the communities of the SAC need to be considered in the known operational scale/known environmental conditions. There is the potential for local significant effects upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport.

Bae Cemlyn/Cemlyn Bay SAC Decommissioning (duration approx 30 years)	
Air Quality	
	Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan – increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wlyfa**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Bae Cemlyn/Cemlyn Bay SAC Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to the footprint of the site through decommissioning activities for example to accommodate waste storage or develop infrastructure.
Potential effects on the SAC: Receptor	Decommissioning activities may result in further disturbance or loss of habitat and the ecological communities they support. In increase in runoff and sediment loading, and alterations to drainage arising from excavation and earthworks during decommissioning also has the potential to significantly affect the integrity of the lagoons and stony banks.
Risk of Likely Significant Effect (LSE)?	As the SAC lies only 650m from the development area, habitats which are designated within this SAC are particularly vulnerable to additional physical loss including direct loss of habitat, reduction in the extent, and changes in hydrology and sediment transport regimes, arising from additional construction works relating to decommissioning
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.

Bae Cemlyn/Cemlyn Bay SAC Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	Dwr Cymru Welsh Water draft Water Resources Management Plan **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wlyfa** **Ynys Enli to Llandudno Shoreline Management Pla**
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Glannau Ynys Gybi / Holy Island Coast SAC

Authorities: Isle of Anglesey

Source: Construction (duration approx 5 years)

Glannau Ynys Gybi/Holy Island Coast SAC Construction (duration approx 5 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the SAC: Receptor	Changes in organic and nutrient loading can impact on maritime communities within the SAC. The maintenance and management of existing water quality and sedimentary regime are key environmental condition requirements of this SAC in the maintenance of the maritime communities present.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site impacts upon water quality as a result of the construction need to be further assessed to determine whether any significant effects are likely.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land.

Glannau Ynys Gybi/Holy Island Coast SAC Construction (duration approx 5 years)	
Water Resources and Quality	
	North Wales Regional Waste Plan – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Glannau Ynys Gybi/Holy Island Coast SAC Construction (duration approx 5 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example dust/ particulates.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading which can impact upon maritime communities of the vegetated sea cliffs and heathlands present within the SAC.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for the SAC. However given the distance of the SAC from the site the impacts of emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Glannau Ynys Gybi/Holy Island Coast SAC Construction (duration approx 5 years)	
Air Quality	
	Decommissioning of the existing nuclear power station at Wlyfa
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Glannau Ynys Gybi/Holy Island Coast SAC Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Construction of the power station and related infrastructure, extension of the site into 'buffer' habitats. Possible development extending into the coastal fringes
Potential effects on the SAC: Receptor	Construction activities can result in a direct loss of terrestrial, marine and sub-tidal habitats given the location of the proposed development site on the coast.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site the impacts of loss and fragmentation of habitat and species arising from the construction stage of the development are unlikely to significantly impact upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Glannau Ynys Gybi/Holy Island Coast SAC Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wlyfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Glannau Ynys Gybi/Holy Island Coast SAC Construction (duration approx 5 years)	
Coastal Squeeze	
Potential Impacts: Pathway	Construction of infrastructure and facilities relating to the operation of the nuclear power station may result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
Potential effects on the SAC: Receptor	Designated habitats of this SAC are vulnerable to the physical loss of supporting habitats and changes to sedimentation regimes. Should construction encroach onto the coastal fringe this may impact on natural sedimentation regimes resulting in changes in erosion and deposition cycles further along the coast.
Risk of Likely Significant Effect (LSE)?	Of the qualifying features of this SAC, vegetated sea cliffs are exposed to changes in sediment transport regimes. However these acidic cliffs are comprised of hard rock, their important vegetation communities residing in the extensive crevices within the folded rocks, thereby are able to withstand harsh conditions. In addition to the distance of this SAC from Nominated site at Wylfa (more than 15km away), significant impacts of coastal squeeze upon this SAC arising from the development are therefore considered unlikely.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss through development. **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. Local Development Plan (The Ynys Môn) - Land take through growth.

Glannau Ynys Gybi/Holy Island Coast SAC Construction (duration approx 5 years)	
Coastal Squeeze	
	Dwr Cymru Weslsh Water draft Water Resources Management Plan The CCW 2002 Review of SPAs Decommissioning of the existing nuclear power station at Wlyfa Ynsys Enli to Llandudno Shoreline Management Plan
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Source: Operation (duration approx 60 years)

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Water Resources/Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10^{o} warmer than the receiving environment).
Potential effects on the SAC: Receptor	Changes in organic and nutrient loading, discharge of biocides used to clean cooling infrastructure, and increased water temperature of water returned to the lake/river/ocean from which it was abstracted can impact on maritime communities within the SAC. Abstraction removes water from the natural cycle, affecting groundwater supply to other habitats including rivers and wet heath, resulting in habitat degradation.
Risk of Likely Significant Effect (LSE)?	The potential impacts of operation effects upon water quality include changes to nutrient composition, temperature and hydrological regimes. Given the distance of the SAC from the site, impacts upon water quality during operation need further investigation to determine whether changes are likely to be significant. With the geographical situation of this SAC being located on Holy Island, an island separated from the Isle of Anglesey by an almost estuarine shallow sea, impacts of water abstraction are unlikely to impact hydrological regimes within this SAC. Accidental radioactive discharges are unlikely given the level of regulatory control. Risk of significant effects of this is therefore unlikely
Potential Impacts - other Plans and	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures).

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Water Resources/Quality	
Programmes	**Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth (nitrogen oxides, sulphur dioxide) are likely to be restricted to a local level for example dust/ particulates. Potential impacts from planned (argon-41, krypton-85 and tritium) and accidental radioactive emissions may impact on local and regional scales.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading. Indirect impacts include changes to water quality from aerial deposition. Changes in air quality can impact upon sensitive maritime communities of the vegetated sea cliffs and heathlands present within the SAC.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for the SAC, although given the distance of the SAC from the site the impacts of planned emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this SAC. Accidental radioactive emissions are unlikely given the level of regulatory control. Risk of significant effects of this is therefore unlikely
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport.

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Air Quality	
	North Wales Regional Waste Plan – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wlyfa**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to footprint of site through operation, for example to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
Potential effects on the SAC: Receptor	Construction activities arising from further expansions and maintenance of permanent infrastructure can result in a direct loss and fragmentation of terrestrial, marine and sub-tidal habitats given the location of the proposed development site on the coast.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site the impacts of loss and fragmentation of habitat and species arising from the operation stage of the development are unlikely to impact upon this SAC
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
	Local Development Plan (The Ynys Môn) - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wlyfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Source: Decommissioning (duration approx 30 years)

Glannau Ynys Gybi/Holy Island Coast SAC Decomissioning (duration approx 30 years)	
Water resources and quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
Potential effects on the SAC: Receptor	Accidental spillage of synthetic and non-synthetic compounds and sediment input may result in nutrient loading, and its discharge into watercourses and sea may lead to impacts upon maritime communities within the SAC.
Risk of Likely Significant Effect (LSE)?	The maintenance of and management of the existing water quality and sedimentary regime is a key environmental condition requirement at this site in the maintenance of the maritime communities present. Given the distance of the SAC from the site the impacts upon water quality arising from decommissioning need to be further assessed before the likelihood of significant effects upon the SAC can be determined.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Glannau Ynys Gybi/Holy Island Coast SAC Decomissioning (duration approx 30 years)	
Water resources and quality	
	Local Development Plan (The Ynys Môn) - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth associated with decommissioning and the emissions arising from [de]construction activity. Likely to be restricted to a local level for example dust/ particulates.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading which can impact upon maritime communities of the vegetated sea cliffs and heathlands present within the SAC.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for the SAC, although given the distance of the SAC from the site the impacts of emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs**

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Air Quality	
	Wales Transport Strategy Plan (2008) **Decommissioning of the existing nuclear power station at Wlyfa**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to footprint of site through decommissioning activities for example to accommodate waste storage, develop infrastructure.
Potential effects on the SAC: Receptor	Deconstruction activities can result in a direct loss and fragmentation of terrestrial, marine and sub-tidal habitats given the location of the proposed development site on the coast.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site the impacts of loss and fragmentation of habitat and species arising from the construction stage of the development are unlikely to impact upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Glannau Ynys Gybi/Holy Island Coast SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wlyfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Corsydd Môn /Anglesey Fens SAC

Authorities: Isle of Anglesey

Source: Construction (duration approx 5 years)

Corsydd Môn /Anglesey Fens SAC Construction (duration approx 5 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the SAC: Receptor	Changes in organic and nutrient discharge and seepage into the catchment area can impact on fen communities and other communities including lakes, wet meadows and wet heaths designated within the SAC which are highly sensitive to changes in water quality and nutrient loads. Earthworks and excavations can alter groundwater levels which may impact upon those designated communities and species within the SAC which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Water quality, nutrient levels and groundwater levels are key environmental conditions required for the maintenance of designated lake, fen, meadow and wet heath communities and their associated designated species within this SAC. Given the distance of the SAC from the site the impacts upon water quality arising from construction need to be further assessed to determine any significant effects.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth.

Corsydd Môn /Anglesey Fens SAC Construction (duration approx 5 years)	
Water Resources and Quality	
	Ynys Môn Deposit Unitary Development Plan – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Corsydd Môn /Anglesey Fens SAC Construction (duration approx 5 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example dust/ particulates.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading and deposition within water sources which can impact upon fen communities including lakes, wet meadows and wet heaths present within the SAC and the species they support.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for this SAC, although given the distance of the SAC from the site the impacts of emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Corsydd Môn /Anglesey Fens SAC Construction (duration approx 5 years)	
Air Quality	
	Decommissioning of the existing nuclear power station at Wlyfa
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Corsydd Môn /Anglesey Fens SAC Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Construction of the power station and related infrastructure, extension of site into 'buffer' habitats.
Potential effects on the SAC: Receptor	Construction activities can lead to increases in organic and nutrient discharge and seepage into the water catchment area. This can adversely impact on fen and other communities including lakes, wet meadows and wet heaths within the SAC which are highly sensitive to changes in water quality and nutrient loads. Earthworks and excavations can also alter groundwater levels which may impact upon those designated communities within the SAC which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site no direct impacts of loss and fragmentation of habitat and species will likely arise from the construction stage of the development.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.

Corsydd Môn /Anglesey Fens SAC Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Dwr Cymru Welsh Water draft Water Resources Management Plan **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wlyfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Source: Operation (duration approx 60 years)

Corsydd Môn /Anglesey Fens SAC Operation (duration approx 60 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10^{o} warmer than the receiving environment).
Potential effects on the SAC: Receptor	Input of organic and nutrient discharge and seepage into the water catchment area can impact on fen communities including lakes, wet meadows and wet heaths within the SAC which are highly sensitive to changes in water quality and nutrient loads. Abstraction removes water from the natural cycle, affecting groundwater supply to these habitats which are dependent upon groundwater levels being maintained. Such habitats support species designated within the SAC.
Risk of Likely Significant Effect (LSE)?	Impacts upon the SAC of organic and nutrient loading arising from planned discharges need further investigation to determine whether changes are likely to be significant. Abstraction of water may result in impacts to hydrological regimes within this SAC should abstraction of water be from the same catchment area as that feeding designated habitats within this SAC. Accidental radioactive discharges are unlikely given the level of regulatory control. Risk of significant effects of this is therefore unlikely.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development.

Corsydd Môn /Anglesey Fens SAC Operation (duration approx 60 years)	
Water Resources and Quality	
	Gwynedd Structure Plan - Minerals –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Corsydd Môn /Anglesey Fens SAC Operation (duration approx 60 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth (nitrogen oxides, sulphur dioxide) are likely to be restricted to a local level for example dust/ particulates. Potential impacts from planned (argon-41, krypton-85 and tritium) and accidental radioactive emissions may impact on local and regional scales.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading. Indirect impacts include changes to water quality from aerial deposition. Changes in air quality can impact upon sensitive fen communities within this SAC including lakes, wet meadows and wet heaths and upon those designated species they support.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for this SAC, although given the distance of the SAC from the site the impacts of planned emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this SAC. Accidental radioactive emissions are unlikely given the level of regulatory control. Risk of significant effects of this is therefore unlikely.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport.

Corsydd Môn /Anglesey Fens SAC Operation (duration approx 60 years)	
Air Quality	
	North Wales Regional Waste Plan – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wlyfa**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Corsydd Môn /Anglesey Fens SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to footprint of site through operation, for exmaple to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
Potential effects on the SAC: Receptor	Additional construction activities May lead to increases in organic and nutrient discharge and seepage into the water catchment area. This can adversely impact on fen and other communities including lakes, wet meadows and wet heaths within the SAC which are highly sensitive to changes in water quality and nutrient loads. Additional earthworks and excavations can also alter groundwater levels which may impact upon those designated communities within the SAC which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site no direct impacts of loss and fragmentation of habitat and species will likely arise from the construction stage of the development.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

Corsydd Môn /Anglesey Fens SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wlyfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Source: Decommissioning (duration approx 30 years)

Corsydd Môn /Anglesey Fens SAC Decommissioning (duration approx 30 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
Potential effects on the SAC: Receptor	Accidental spillage of synthetic and non-synthetic compounds and sediment input may result in nutrient loading, and its discharge into watercourses may lead to impacts upon fen and other communities including lakes, wet meadows and wet heaths within the SAC which are highly sensitive to changes in water quality and nutrient loads.
Risk of Likely Significant Effect (LSE)?	The maintenance and management of existing hydrology is key to maintaining designated sites within the SAC in favourable condition. Given the distance of the SAC from the site the impacts upon water quality arising from decommissioning need to be further assessed to determine whether catchment areas are shared and therefore whether impacts will be transferred to the SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

Corsydd Môn /Anglesey Fens SAC Decommissioning (duration approx 30 years)	
Water Resources and Quality	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Corsydd Môn /Anglesey Fens SAC Decommissioning (duration approx 30 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth associated with decommissioning and the emissions arising from [de]construction activity. Likely to be restricted to a local level for example dust/ particulates.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading which can impact upon designated communities and upon those species they support.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for this SAC, although given the distance of the SAC from the site the impacts of emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Corsydd Môn /Anglesey Fens SAC Decommissioning (duration approx 30 years)	
Air Quality	
	Decommissioning of the existing nuclear power station at Wlyfa
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Corsydd Môn /Anglesey Fens SAC Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to footprint of site through decommissioning activities for example to accommodate waste storage, develop infrastructure.
Potential effects on the SAC: Receptor	Deconstruction activities can lead to increases in organic and nutrient discharge and seepage into the water catchment area. This can adversely impact on fen and other communities including lakes, wet meadows and wet heaths within the SAC which are highly sensitive to changes in water quality and nutrient loads. Earthworks and excavations arising from deconstruction works can also alter groundwater levels which may impact upon those designated communities within the SAC which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site no direct impacts of loss and fragmentation of habitat and species will likely arise from deconstruction.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Corsydd Môn /Anglesey Fens SAC Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	Local Development Plan (The Ynys Môn) - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wlyfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Llyn Dinam SAC

Authorities: Isle of Anglesey

Source: Construction (duration approx 5 years)

Llyn Dinam SAC Construction (duration approx 5 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the SAC: Receptor	Changes in organic and nutrient discharge and seepage into the catchment area can impact upon the lake community which is highly sensitive to changes in water quality and nutrient loads. Earthworks and excavations can alter groundwater levels which may impact upon the designated community within the SAC which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Water quality, nutrient levels and groundwater levels are key environmental conditions required for the maintenance of the designated lake community within the SAC site. Given the distance of the SAC from the site the impacts upon water quality arising from construction need to be further assessed to determine any significant effects.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land.

Llyn Dinam SAC Construction (duration approx 5 years)	
Water Resources and Quality	
	North Wales Regional Waste Plan – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Llyn Dinam SAC Construction (duration approx 5 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example dust/ particulates.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading which can impact upon the lake communities within the SAC.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for this SAC, although given the distance of the SAC from the site the impacts of emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Llyn Dinam SAC Construction (duration approx 5 years)	
Air Quality	
	Decommissioning of the existing nuclear power station at Wlyfa
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Llyn Dinam SAC Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Construction of the power station and related infrastructure, extension of site into 'buffer' habitats
Potential effects on the SAC: Receptor	Construction activities can lead to increases in organic and nutrient discharge and seepage into the water catchment area. This can adversely impact on lake communities within the SAC which are highly sensitive to changes in water quality and nutrient loads. Earthworks and excavations can also alter groundwater levels which may impact upon designated communities within the SAC which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site no direct impacts of loss and fragmentation of habitat and species will likely arise from the construction stage of the development.
Potential Impacts - other Plans and Programmes	**Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wylfa**

Llyn Dinam SAC Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Ynys Enli to Llandudno Shoreline Management Plan
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Source: Operation (duration approx 60 years)

Llyn Dinam SAC Operation (duration approx 60 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10^{o} warmer than the receiving environment).
Potential effects on the SAC: Receptor	Abstraction removes water from the natural cycle, affecting groundwater levels within the catchment area which may be linked to those catchment areas upon which the SAC rely.
Risk of Likely Significant Effect (LSE)?	Abstraction of water may result in impacts to hydrological regimes within this SAC should abstraction of water be from the same catchment area as that feeding the designated habitat. Given the distance of the SAC from the site, impacts upon water quality during operation need further investigation to determine whether changes are likely to be significant. Accidental radioactive discharges are unlikely given the level of regulatory control. Risk of significant effects of this is therefore unlikely.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

Llyn Dinam SAC Operation (duration approx 60 years)	
Water Resources and Quality	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Llyn Dinam SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to footprint of site through operation, for example to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats.
Potential effects on the SAC: Receptor	Additional construction activities May lead to increases in organic and nutrient discharge and seepage into the water catchment area. This can adversely lake communities within the SAC which are highly sensitive to changes in water quality and nutrient loads. Additional earthworks and excavations can also alter groundwater levels which may impact upon designated communities within the SAC which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site no direct impacts of loss and fragmentation of habitat and species will likely arise from the construction stage of the development.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.

Llyn Dinam SAC Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
	Dwr Cymru Welsh Water draft Water Resources Management Plan **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wlyfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Source: Decommissioning (duration approx 30 years)

Llyn Dinam SAC Decommissioning (duration approx 30 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
Potential effects on the SAC: Receptor	Accidental spillage of synthetic and non-synthetic compounds and sediment input may result in nutrient loading, and its discharge into watercourses may lead to impacts upon groundwater quality which could impact upon groundwater sources feeding into the SAC
Risk of Likely Significant Effect (LSE)?	Water quality, nutrient levels and groundwater levels are key environmental conditions required for the maintenance of the designated lake community within the SAC site. Given the distance of the SAC from the site the impacts upon water quality arising from decommissioning need to be further assessed to determine whether catchment areas are shared and therefore whether impacts will be transferred to the SAC.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Llyn Dinam SAC Decommissioning (duration approx 30 years)	
Water Resources and Quality	
	Local Development Plan (The Ynys Môn) - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Llyn Dinam SAC Decommissioning (duration approx 30 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth associated with decommissioning and the emissions arising from [de]construction activity. Likely to be restricted to a local level for example dust/ particulates.
Potential effects on the SAC: Receptor	An increase in airborne pollutants can lead to nutrient loading which can impact upon designated lake communities and upon those species they support.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for this SAC, although given the distance of the SAC from the site the impacts of emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this SAC
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Llyn Dinam SAC Decommissioning (duration approx 30 years)	
Air Quality	
	Decommissioning of the existing nuclear power station at Wylfa
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Llyn Dinam SAC Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to footprint of site through decommissioning activities for example to accommodate waste storage, develop infrastructure.
Potential effects on the SAC: Receptor	Deconstruction activities can lead to increases in organic and nutrient discharge and seepage into the water catchment area. This can adversely impact lake communities within the SAC which are highly sensitive to changes in water quality and nutrient loads. Earthworks and excavations arising from deconstruction works can also alter groundwater levels which may impact upon designated communities within the SAC which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the site no direct impacts of loss and fragmentation of habitat and species will likely arise from deconstruction
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.

Llyn Dinam SAC Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	Dwr Cymru Welsh Water draft Water Resources Management Plan **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wylfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC

Authorities: Isle of Anglesey

Source: Construction (duration approx 5 years)

Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC Construction (duration approx 5 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the SAC: Receptor	Changes in organic and nutrient discharge; may impact upon this SAC. The qualifying habitats (sandbanks, mud flats, sand flats and reefs) are all sensitive to changes in water quality, and this could impact on the species associated with the SAC, for instance common scoter use sandbanks to feed on.
Risk of Likely Significant Effect (LSE)?	Water quality, and nutrient levels are key environmental conditions required for the maintenance of the designated SAC site. Given the distance of the SAC from the nominated site (over 15km away), the impacts upon water quality arising from construction may impact on the SAC
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land.

Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC Construction (duration approx 5 years)	
Water Resources and Quality	
	North Wales Regional Waste Plan – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC Construction (duration approx 5 years	
Coastal Squeeze	
Potential Impacts: Pathway	Construction of infrastructure and facilities relating to the operation of the nuclear power station may result in encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activities.
Potential effects on the SAC: Receptor	Designated habitats and species are located along the coastal fringe and are therefore particularly vulnerable to physical loss of supporting habitats, and changes to hydrology or sedimentation regimes arising from construction. Such impacts losses or changes could alter the condition of the SAC
Risk of Likely Significant Effect (LSE)?	Given the distance of the SAC from the nominated site (more than 15km away), the impacts of coastal squeeze arising from construction may have an impact on the designated features (habitats and associated species) of the SAC. The current footprint of the development and design requirements remains unknown therefore likely effects may occur.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss through development. **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. Local Development Plan (The Ynys Môn) - Land take through growth.

Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC Construction (duration approx 5 years	
Coastal Squeeze	
	Dwr Cymru Weslsh Water draft Water Resources Management Plan The CCW 2002 Review of SPAs Decommissioning of the existing nuclear power station at Wlyfa Ynsys Enli to Llandudno Shoreline Management Plan
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Source: Operation (duration approx 60 years)

Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC Operation (duration approx 60 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10^{o} warmer than the receiving environment).
Potential effects on the SAC: Receptor	Changes in organic and nutrient loading, discharge of biocides used to clean cooling infrastructure, and increased water temperature of abstracted water returned to the sea can promote algal growth and could potentially impact designated communities further downstream of the nominated Site.
Risk of Likely Significant Effect (LSE)?	Potential for operational works to have effects of water quality and temperature, which could impact on the SAC further downstream. Changes to hydrological and sediment loading may also impact on water quality, which could impact on the habitats, already in unfavourable condition.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.

Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC Operation (duration approx 60 years)	
Water Resources and Quality	
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Source: Decommissioning (duration approx 30 years)

Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC Decommissioning (duration approx 30 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from deconstruction activities, earthworks, infrastructure, waste storage.
Potential effects on the SAC: Receptor	Accidental spillage of synthetic and non-synthetic compounds and sediment input may result in nutrient loading, and such discharges into the sea may lead to impacts upon water quality, which could impact upon the SAC
Risk of Likely Significant Effect (LSE)?	Water quality, nutrient levels are key environmental conditions required for the maintenance of the designated habitats within the SAC site. However, given the distance of the SAC from the site the impacts upon water quality arising from construction need to be further assessed to determine any significant effects.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Y Fenai a Bae Conwy/Menai Strait and Conwy Bay SAC Decommissioning (duration approx 30 years)	
Water Resources and Quality	
	Local Development Plan (The Ynys Môn) - Land take through growth.
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA

Authorities: Isle of Anglesey

Source: Construction (duration approx 5 years)

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the SPA: Receptor	Changes in organic, and nutrient discharge; changes in salinity in can impact upon the lagoon and upon fish species which will impact upon designated bird species.
Risk of Likely Significant Effect (LSE)?	The nominated site partially lies within 650 m of the development site. Any changes in water quality and nutrient levels will impact upon designated species through contamination up the food chain. Given the distance of the SPA from the site the impacts upon water quality arising from construction need to be further assessed to determine any significant effects
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Water Resources and Quality	
	Local Development Plan (The Ynys Môn) - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example dust/ particulates.
Potential effects on the SPA: Receptor	An increase in airborne pollutants can lead to nutrient loading which can impact upon the lagoon communities within the SPA.
Risk of Likely Significant Effect (LSE)?	Air quality is a not a major vulnerability for this SPA, however given the distance of the SPA from the site the impacts of air quality arising from the construction stage of the development are likely to impact upon habitats within the SPA upon which designated bird species depend.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Air Quality	
	Decommissioning of the existing nuclear power station at Wylfa
Risk from 'In Combination' Effects?	Unlikely to be significant.
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Construction activity (scheduled for up to 6-7 years) likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. In some years, the Roseate Terns favour the Skerries to breed on, while during other years the prefer other sites. The reasons for this desertion during some years is unknown, however an increase in disturbance locally could impact further on this site, from on site and off site sources. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success.
Risk of Likely Significant Effect (LSE)?	The SPA is divided into 3 isolated locations. Cemlyn Bay being the closed at approximately 650m from the development site. The Skerries could potentially be impacted upon through an increase in marine transport, passing the island. It is thought that Ynys Feurig will not be impacted upon through disturbance, given the distance of this part of the SPA from the site the development site. Impacts of noise, light and visual disturbance arising from the development are likely to impact upon this SPA, in particular the Cemlyn Bay part. Part of the nominated SPA is very close to the development site, being approximately 650m away. Physical disturbance through noise, vibration and an increase in light could potentially impact on the integrity of the site. Disturbance to birds is known to alter their foraging, roosting and breeding patterns, which could result in displacement, reduced feeding capacity and effects on breeding success/survival. The risk of disturbance, in particular to the Skerries and Cemlyn Bay, given their proximity to the development site, is considered likely.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport.

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Disturbance (Noise, light, visual)	
	Gwynedd Structure Plan - Minerals –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**
Risk from 'In Combination' Effects?	Unlikely to be significant.
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	General construction of facilities and infrastructure, construction of cooling water culverts, extension of site into 'buffer' habitats, possible development at the coastal fringes.
Potential effects on the SPA: Receptor	Direct loss of habitat is likely to reduce the carrying capacity of the designated site, by reducing the available food and roosting habitats available for birds.
Risk of Likely Significant Effect (LSE)?	Bird species designated within the SPA could be impacted upon through loss of fish and habitat
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wylfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Coastal Squeeze	
Potential Impacts: Pathway	Construction of infrastructure and facilities relating to the operation of the power station may result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
Potential effects on the SPA: Receptor	The designated habitats and associated bird species, located along the coastal fringe, are sensitive to the physical losses of supporting habitats, changes in hydrology and sedimentation regimes.
Risk of Likely Significant Effect (LSE)?	The nominated Site lies close to one part of the SPA (Cemlyn Bay). This would be vulnerable to any physical loss or changes in structure. The exact development footprint remains unknown, however it is thought likely that coastal squeeze has the potential to impact significantly on the SPA. Both Ynys Feurig and The Skerries parts of the SPA are unlikely to be impacted upon, due to their distances from the development site.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss through development. **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. Local Development Plan (The Ynys Môn) - Land take through growth. Dwr Cymru Weslsh Water draft Water Resources Management Plan

Ynys Feurig, Cemlyn Bay and the Skerries SPA Construction (duration approx 5 years)	
Coastal Squeeze	
	The CCW 2002 Review of SPAs Decommissioning of the existing nuclear power station at Wylfa Ynys Enli to Llandudno Shoreline Management Plan
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Source: Operation (duration approx 60 years)

Ynys Feurig, Cemlyn Bay and the Skerries SPA Operation (duration approx 60 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10^{o} warmer than the receiving environment).
Potential effects on the SPA: Receptor	Changes in organic, nutrient loading, discharge of biocides used to clean cooling infrastructure, and increased water temperatures of abstracted water returned to the sea can adversely impact upon fish populations and therefore directly impact upon the designated bird species. Waterfowl are particularly susceptible to the accumulation of toxins through the food chain.
Risk of Likely Significant Effect (LSE)?	There is the potential for operational uses to change the water quality and temperature. This could impact upon fish populations which designated bird species depend upon as a food resource. Adverse impacts upon this SPA are therefore likely.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.

Ynys Feurig, Cemlyn Bay and the Skerries SPA Operation (duration approx 60 years)	
Water Resources and Quality	
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA Operation (duration approx 60 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/traffic growth (nitrogen oxides, sulphur dioxide). Potential impacts from planned (argon-41, krypton-85 and tritium) and accidental radioactive emissions. .
Potential effects on the SPA: Receptor	An increase in airborne pollutants can lead to nutrient loading and changes in water quality from aerial deposition, affecting habitats upon which designated bird species depend. Accidental radioactive emissions are unlikely given the level of regulatory control. Risk of significant effects of this is therefore unlikely.
Risk of Likely Significant Effect (LSE)?	The nominated Site lies close to one part of the SPA (Cemlyn Bay), this would be vulnerable to detrimental changes in air quality. Ynys Feurig part of the SPA is likely to be unaffected to changes in air quality due to prevailing winds coming from the south west. Similarly for The Skerries, however this part is closer to the nominated Site, and may be impacted upon to some extent.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport

Ynys Feurig, Cemlyn Bay and the Skerries SPA Operation (duration approx 60 years)	
Air Quality	
	movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA Operation (duration approx 60 years)	
Air Quality	
Potential Impacts: Pathway	Changes to footprint of site through operation, for example to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
Potential effects on the SPA: Receptor	Potential loss of designated habitats as well as of supporting and buffer habitats upon which designated breeding birds are dependant**.**
Risk of Likely Significant Effect (LSE)?	Part of the nominated Site lies near to Cemlyn Bay. Changes to the footprint of the site to accommodate further infrastructure will likely lead to loss of supporting and buffer habitats, and potentially result in loss or degradation of habitats within the SPA. Ynys Feurig part of the SPA is likely to be unaffected to changes in habitat/species loss and fragmentation due to its distance from the nominated Site. However The Skerries, may be impacted upon to some extent, being closer to the nominated Site.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

Ynys Feurig, Cemlyn Bay and the Skerries SPA Operation (duration approx 60 years)	
Air Quality	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wylfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Source: Decommissioning (duration approx 30 years)

Ynys Feurig, Cemlyn Bay and the Skerries SPA Decommissioning (duration approx 30 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
Potential effects on the SPA: Receptor	Changes in organic and nutrient loading can impact upon the qualifying bird species of the SPA, through bioaccumulation through the food chain. Contamination by synthetic and non-synthetic compounds is also an issue for the surrounding habitats for instance mudflats, as toxins can bind to sediments, affecting the supporting species.
Risk of Likely Significant Effect (LSE)?	The maintenance of high water quality and existing hydrological and sedimentary regimes is critical at maintaining the lagoon environments at Cemlyn Bay, part of the SPA. A deterioration in water quality could impact on the food supplies around Cemlyn Bay and The Skerries, significantly impacting upon the qualifying bird species of the SPA.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth

Ynys Feurig, Cemlyn Bay and the Skerries SPA Decommissioning (duration approx 30 years)	
Water Resources and Quality	
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA Decommissioning (duration approx 30 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/traffic growth associated with decommissioning and the emission arising from deconstruction activity. Likely to be restricted to a local level for example dust/particulates
Potential effects on the SPA: Receptor	An increase in airborne pollutants can lead to nutrient loading and changes in water quality from aerial deposition.
Risk of Likely Significant Effect (LSE)?	The nominated Site lies close to one part of the SPA (Cemlyn Bay). Habitats which support designated bird species within this SPA are vulnerable to detrimental changes in air quality.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Ynys Feurig, Cemlyn Bay and the Skerries SPA Decommissioning (duration approx 30 years)	
Air Quality	
	Decommissioning of the existing nuclear power station at Wylfa
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to footprint of site through decommissioning activities for example to accommodate waste storage and develop infrastructure.
Potential effects on the SPA: Receptor	Deconstruction activities may result in further loss of habitat and the ecological communities dependent on them.
Risk of Likely Significant Effect (LSE)?	The nominated Site lies within 650 m to Cemlyn Bay (one third of the SPA). Habitat/species loss and fragmentation could impact upon the breeding success of the birds. Species (bird) qualifying in the SPA are particularly vulnerable to further physical loss including direct loss of habitat, loss of fish/food supplies, and changes to hydrology and sediment transport regimes arising from deconstruction. Loss of species and habitat is likely to have an impact.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan**

Ynys Feurig, Cemlyn Bay and the Skerries SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	The CCW 2002 Review of SPAs **Decommissioning of the existing nuclear power station at Wylfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	'In-combination' effects likely
AA Required?	Yes

Ynys Feurig, Cemlyn Bay and the Skerries SPA Decommissioning (duration approx 30 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Decommissioning activities (scheduled for up to 30 years) are likely to result in significant local increases in noise events, light pollution and visual disturbances in and around the vicinity of the nominated Site.
Potential effects on the SPA: Receptor	Physical disturbance arising from noise and vibration to coastal communities and component species (birds). Breeding birds around Cemlyn Bay are subject to disturbance from public access to the coastal footpath. Additional lighting in the area may cause disturbance to the nesting birds.
Risk of Likely Significant Effect (LSE)?	The nominated Site lies within 650 m to Cemlyn Bay (one third of the SPA). Physical disturbance through noise, light and vibration impacts could an impact upon the breeding success of the birds. Further studies are required.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**

Ynys Feurig, Cemlyn Bay and the Skerries SPA Decommissioning (duration approx 30 years)	
Disturbance (Noise, light, visual)	
Risk from 'In Combination' Effects?	In-combination' effects likely
AA Required?	Yes

Lavan Sands, Conwy Bay SPA

Authorities: Gwynedd, Conwy

Source: Construction (duration approx 5 years)

Lavan Sands, Conwy Bay SPA Construction (duration approx 5 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the SPA: Receptor	The release of pollutants including radioactive and non-radioactive toxins into the sea can lead to the bioaccumulation in ecosystems, particularly mud flats and salt marshes. The primary food source for the Oystercatcher is cockles and mussels which bioaccumulate toxins very efficiently due to their filter feeding physiology. Reductions in water quality can alter the abundance, distribution and quality of prey items.
Risk of Likely Significant Effect (LSE)?	Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], radioactive and non-radioactive toxic discharges will be directed easterly towards Puffin Island which overlaps with Menai Strait and Conwy Bay SAC. Despite the distance from nominated site at Wylfa the effects of toxic pollution are potentially significant.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development.

1 North West England and North Wales Shoreline Management Plan: Appendix C: Baseline Process Understanding http://mycoastline.org/documents/overview1.pdf

Lavan Sands, Conwy Bay SPA Construction (duration approx 5 years)	
Water Resources and Quality	
	Gwynedd Structure Plan - Minerals –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Lavan Sands, Conwy Bay SPA Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Construction of the power station and related infrastructure, extension of site into 'buffer' habitats. Possible development extending into the coastal fringes.
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Lavan Sands SAC through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Oystercatcher
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Lavan Sands.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Lavan Sands, Conwy Bay SPA Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wylfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Lavan Sands, Conwy Bay SPA Construction (duration approx 5 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Construction activity (scheduled for up to 6-7 years) likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success.
Risk of Likely Significant Effect (LSE)?	Direct impacts on Lavan Sands are unlikely however there is potential for indirect impacts through displacement of birds from sites nearer to Wylfa that are directly disturbed towards this SPA.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**

Lavan Sands, Conwy Bay SPA Construction (duration approx 5 years)	
Disturbance (Noise, light, visual)	
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Lavan Sands, Conwy Bay SPA Construction (duration approx 5 years)	
Coastal Squeeze	
Potential Impacts: Pathway	Construction of infrastructure and facilities relating to the operation of a new nuclear power station may result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
Potential effects on the SPA: Receptor	The degree of coastal squeeze impacts upon the Menai Strait and Conwy Bay SAC are currently undetermined and given that its boundaries overlap with Lavan Sands SAC.
Risk of Likely Significant Effect (LSE)?	Dependent upon the impacts upon Menai Straits and Conwy Bay SAC there is potential for significant effects upon Lavan Sands SAC
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss through development. **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. Local Development Plan (The Ynys Môn) - Land take through growth. Dwr Cymru Welsh Water draft Water Resources Management Plan The CCW 2002 Review of SPAs

Lavan Sands, Conwy Bay SPA Construction (duration approx 5 years)	
Coastal Squeeze	
	Decommissioning of the existing nuclear power station at Wylfa Ynys Enli to Llandudno Shoreline Management Plan
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Source: Operation (duration approx 60 years)

Lavan Sands, Conwy Bay SPA Operation (duration approx 60 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
Potential effects on the SPA: Receptor	The release of pollutants including radioactive and non-radioactive toxins into the sea can lead to the bioaccumulation in ecosystems, particularly mud flats and salt marshes. The primary food source for the Oystercatcher is cockles which bioaccumulate toxins very efficiently due to their filter feeding physiology. Reductions in water quality can alter the abundance, distribution and quality of prey items.
Risk of Likely Significant Effect (LSE)?	Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], radioactive and non-radioactive toxic discharges will be directed easterly towards Lavan Sands which overlaps with Menai Strait and Conwy Bay SAC. Despite the distance from nominated site at Wylfa the effects of toxic pollution are potentially significant
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land.

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Lavan Sands, Conwy Bay SPA Operation (duration approx 60 years)	
Water Resources and Quality	
	North Wales Regional Waste Plan – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Lavan Sands, Conwy Bay SPA Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to the footprint of the site through operation for example, to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Lavan Sands SAC through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Oystercatcher
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Lavan Sands.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.

Lavan Sands, Conwy Bay SPA Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
	Dwr Cymru Welsh Water draft Water Resources Management Plan **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wylfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	No
AA Required?	No

Lavan Sands, Conwy Bay SPA Operation (duration approx 60 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Operational activity may result in significant local increases in noise and vibration events, light pollution and visual disturbance in and around the immediate vicinity of the site.
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success.
Risk of Likely Significant Effect (LSE)?	Direct impacts on Lavan Sands are unlikely given its distance from the nominated site. However there is potential for indirect impacts through displacement of birds from sites nearer to Wylfa that are directly disturbed towards this SPA.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Lavan Sands, Conwy Bay SPA Operation (duration approx 60 years)	
Disturbance (Noise, light, visual)	
	Decommissioning of the existing nuclear power station at Wylfa
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Source: Decommissioning (duration approx 30 years)

Lavan Sands, Conwy Bay SPA Decommissioning (duration approx 30 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from deconstruction activities, earthworks, infrastructure and waste storage.
Potential effects on the SPA: Receptor	The release of pollutants including radioactive and non-radioactive toxins into the sea can lead to the bioaccumulation in ecosystems, particularly mud flats and salt marshes. The primary food source for the Oystercatcher is cockles and mussels which bioaccumulate toxins very efficiently due to their filter feeding physiology. Reductions in water quality can alter the abundance, distribution and quality of prey items.
Risk of Likely Significant Effect (LSE)?	Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], radioactive and non-radioactive toxic discharges will be directed easterly towards Lavan Sands which overlaps with Menai Strait and Conwy Bay SAC. Despite the distance from nominated site at Wylfa the effects of toxic pollution are potentially significant.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land.

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Lavan Sands, Conwy Bay SPA Decommissioning (duration approx 30 years)	
Water Resources and Quality	
	North Wales Regional Waste Plan – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Lavan Sands, Conwy Bay SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to the footprint of the site through decommissioning activities for example to accommodate waste storage or develop infrastructure.
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Lavan Sands SAC through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Oystercatcher.
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Lavan Sands.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Lavan Sands, Conwy Bay SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wylfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Lavan Sands, Conwy Bay SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to the footprint of the site through decommissioning activities for example to accommodate waste storage or develop infrastructure.
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Lavan Sands SAC through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Oystercatcher.
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Lavan Sands.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Lavan Sands, Conwy Bay SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wylfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Lavan Sands, Conwy Bay SPA Decommissioning (duration approx 30 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Decommissioning activities (scheduled for up to 30 years) are likely to result in significant local increases in noise events, light pollution and visual disturbances in and around the vicinity of the nominated Site.
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success
Risk of Likely Significant Effect (LSE)?	Direct impacts on Lavan Sands are unlikely however there is potential for indirect impacts through displacement of birds from sites nearer to Wylfa that are directly disturbed towards this SPA.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/transport. **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**

Lavan Sands, Conwy Bay SPA Decommissioning (duration approx 30 years)	
Disturbance (Noise, light, visual)	
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Puffin Island SPA

Source: Construction (duration approx 5 years)

Puffin Island SPA Construction (duration approx 5 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the SPA: Receptor	The release of pollutants including radioactive and non-radioactive toxins into the sea can lead to the bioaccumulation in ecosystems, particularly mud flats and salt marshes. Reductions in water quality can alter the abundance, distribution and quality of prey items.
Risk of Likely Significant Effect (LSE)?	Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], radioactive and non-radioactive toxic discharges will be directed easterly towards Puffin Island which overlaps with Menai Strait and Conwy Bay SAC. Despite the distance from nominated site at Wylfa the effects of toxic pollution are potentially significant.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land.

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Puffin Island SPA Construction (duration approx 5 years)	
Water Resources and Quality	
	North Wales Regional Waste Plan – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Puffin Island SPA Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Construction of the power station and related infrastructure, extension of site into 'buffer' habitats. Possible development extending into the coastal fringe
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Puffin Island SAC through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Cormorant
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Puffin Island
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Puffin Island SPA Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wylfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Puffin Island SPA Construction (duration approx 5 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Construction activity (scheduled for up to 6-7 years) likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success.
Risk of Likely Significant Effect (LSE)?	Direct impacts on Puffin Island are unlikely however there is potential for indirect impacts through displacement of birds from sites nearer to Wylfa that are directly disturbed towards this SPA.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)**

Puffin Island SPA Construction (duration approx 5 years)	
Disturbance (Noise, light, visual)	
	Decommissioning of the existing nuclear power station at Wylfa
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Puffin Island SPA Construction (duration approx 5 years)	
Coastal Squeeze	
Potential Impacts: Pathway	Construction of infrastructure and facilities relating to the operation of the nuclear power station may result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
Potential effects on the SPA: Receptor	The degree of coastal squeeze impacts upon Puffin Island SPA are currently undetermined and given that its boundaries overlap with Menai Strait and Conwy Bay SAC.
Risk of Likely Significant Effect (LSE)?	Dependent upon the impacts upon Menai Straits and Conwy Bay SAC there is potential for significant effects upon Puffin Island SPA
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss through development. **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. Local Development Plan (The Ynys Môn) - Land take through growth. Dwr Cymru Weslsh Water draft Water Resources Management Plan The CCW 2002 Review of SPAs

Puffin Island SPA Construction (duration approx 5 years)	
Coastal Squeeze	
	Decommissioning of the existing nuclear power station at Wylfa Ynys Enli to Llandudno Shoreline Management Plan
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Source: Operation (duration approx 60 years)

Puffin Island SPA Operation (duration approx 60 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
Potential effects on the SPA: Receptor	The release of pollutants including radioactive and non-radioactive toxins into the sea can lead to the bioaccumulation in ecosystems, particularly mud flats and salt marshes. Reductions in water quality can alter the abundance, distribution and quality of prey items.
Risk of Likely Significant Effect (LSE)?	Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], radioactive and non-radioactive toxic discharges will be directed easterly towards Puffin Island which overlaps with Menai Strait and Conwy Bay SAC. Despite the distance from nominated site at Wylfa the effects of toxic pollution are potentially significant.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

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Puffin Island SPA Operation (duration approx 60 years)	
Water Resources and Quality	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Puffin Island SPA Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to the footprint of the site through operation for example, to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Puffin Island SAC through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Cormorant
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Puffin Island
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.

Puffin Island SPA Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
	Dwr Cymru Welsh Water draft Water Resources Management Plan **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wylfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Puffin Island SPA Operation (duration approx 60 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Operational activity may result in significant local increases in noise and vibration events, light pollution and visual disturbance in and around the immediate vicinity of the site.
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success.
Risk of Likely Significant Effect (LSE)?	Direct impacts on Puffin Island are unlikely however there is potential for indirect impacts through displacement of birds from sites nearer to Wylfa that are directly disturbed towards this SPA
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**

Puffin Island SPA Operation (duration approx 60 years)	
Disturbance (Noise, light, visual)	
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Source: Decommissioning (duration approx 30 years)

Puffin Island SPA Decommissioning (duration approx 30 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from deconstruction activities, earthworks, infrastructure and waste storage.
Potential effects on the SPA: Receptor	The release of pollutants including radioactive and non-radioactive toxins into the sea can lead to the bioaccumulation in ecosystems, particularly mud flats and salt marshes. Reductions in water quality can alter the abundance, distribution and quality of prey items.
Risk of Likely Significant Effect (LSE)?	Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], radioactive and non-radioactive toxic discharges will be directed easterly towards Puffin Island which overlaps with Menai Strait and Conwy Bay SAC. Despite the distance from nominated site at Wylfa the effects of toxic pollution are potentially significant.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

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Puffin Island SPA Decommissioning (duration approx 30 years)	
Water Resources and Quality	
	Local Development Plan (The Ynys Môn) - Land take through growth.
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Puffin Island SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to the footprint of the site through decommissioning activities for example to accommodate waste storage or develop infrastructure.
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Puffin Island SAC through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Cormorant
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Puffin Island
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Puffin Island SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wylfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Puffin Island SPA Decommissioning (duration approx 30 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Decommissioning activities (scheduled for up to 30 years) are likely to result in significant local increases in noise events, light pollution and visual disturbances in and around the vicinity of the nominated Site.
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success.
Risk of Likely Significant Effect (LSE)?	Direct impacts on Puffin Island are unlikely however there is potential for indirect impacts through displacement of birds from sites nearer to Wylfa that are directly disturbed towards this SPA.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**

Puffin Island SPA Decommissioning (duration approx 30 years)	
Disturbance (Noise, light, visual)	
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Liverpool Bay SPA

Source: Construction (duration approx 5 years)

Liverpool Bay SPA Construction (duration approx 5 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the SPA: Receptor	The release of pollutants including radioactive and non-radioactive toxins into the sea can lead to the bioaccumulation in ecosystems, particularly mud flats and salt marshes. The primary food source for the Common Scroter is Bivalves which bioaccumulate toxins very efficiently due to their filter feeding physiology. Reductions in water quality can alter the abundance, distribution and quality of prey items.
Risk of Likely Significant Effect (LSE)?	Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], radioactive and non-radioactive toxic discharges will be directed easterly towards Liverpool Bay SPA which overlaps with Menai Strait and Conwy Bay SAC. Despite the distance from nominated site at Wylfa the effects of toxic pollution are potentially significant.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth.

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Liverpool Bay SPA Construction (duration approx 5 years)	
Water Resources and Quality	
	Ynys Môn Deposit Unitary Development Plan – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Liverpool Bay SPA Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Construction of the power station and related infrastructure, extension of site into 'buffer' habitats. Possible development extending into the coastal fringes.
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Liverpool Bay through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Cormorant.
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Liverpool Bay
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Liverpool Bay SPA Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wylfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Liverpool Bay SPA Construction (duration approx 5 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Construction activity (scheduled for up to 6-7 years) likely to result in significant local increases in noise events, light pollution and visual disturbance in and around the immediate vicinity of the site.
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success
Risk of Likely Significant Effect (LSE)?	Direct impacts on Liverpool Bay are unlikely however there is potential for indirect impacts through displacement of birds from sites nearer to Wylfa that are directly disturbed towards this SPA.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wlyfa**

Liverpool Bay SPA Construction (duration approx 5 years)	
Disturbance (Noise, light, visual)	
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Liverpool Bay SPA Construction (duration approx 5 years)	
Coastal Squeeze	
Potential Impacts: Pathway	Construction of infrastructure and facilities relating to the operation of the nuclear power station may result in an encroachment upon land at the coastal fringes. All supporting habitats are sensitive to removal by land reclamation and construction activity.
Potential effects on the SPA: Receptor	The degree of coastal squeeze impacts upon Liverpool Bay SPA are currently undetermined and given that its boundaries overlap with Menai Strait and Conwy Bay SAC.
Risk of Likely Significant Effect (LSE)?	Dependent upon the impacts upon Menai Straits and Conwy Bay SAC there is potential for significant effects upon Liverpool Bay SPA
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss through development. **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. Local Development Plan (The Ynys Môn) - Land take through growth. Dwr Cymru Welsh Water draft Water Resources Management Plan The CCW 2002 Review of SPAs

Liverpool Bay SPA Construction (duration approx 5 years)	
Coastal Squeeze	
	Decommissioning of the existing nuclear power station at Wylfa Ynys Enli to Llandudno Shoreline Management Plan
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Source: Operation (duration approx 60 years)

Liverpool Bay SPA Operation (duration approx 60 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10° warmer than the receiving environment).
Potential effects on the SPA: Receptor	The release of pollutants including radioactive and non-radioactive toxins into the sea can lead to the bioaccumulation in ecosystems, particularly mud flats and salt marshes. The primary food source for the Common Scoter is Bivalves which bioaccumulate toxins very efficiently due to their filter feeding physiology. Reductions in water quality can alter the abundance, distribution and quality of prey items.
Risk of Likely Significant Effect (LSE)?	Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], radioactive and non-radioactive toxic discharges will be directed easterly towards Liverpool Bay SPA which overlaps with Menai Strait and Conwy Bay SAC. Despite the distance from nominated site at Wylfa the effects of toxic pollution are potentially significant
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land.

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Liverpool Bay SPA Operation (duration approx 60 years)	
Water Resources and Quality	
	North Wales Regional Waste Plan – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Liverpool Bay SPA Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to the footprint of the site through operation for example, to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Puffin Island through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Cormorant.
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Liverpool Bay
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.

Liverpool Bay SPA Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
	Dwr Cymru Welsh Water draft Water Resources Management Plan **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wylfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Liverpool Bay SPA Operation (duration approx 60 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Operational activity may result in significant local increases in noise and vibration events, light pollution and visual disturbance in and around the immediate vicinity of the site.
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success.
Risk of Likely Significant Effect (LSE)?	Direct impacts on Liverpool Bay SPA are unlikely however there is potential for indirect impacts through displacement of birds from sites nearer to Wylfa that are directly disturbed towards this SPA.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**

Liverpool Bay SPA Operation (duration approx 60 years)	
Disturbance (Noise, light, visual)	
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Source: Decommissioning (duration approx 30 years)

Liverpool Bay SPA Decommissioning (duration approx 30 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from deconstruction activities, earthworks, infrastructure and waste storage
Potential effects on the SPA: Receptor	The release of pollutants including radioactive and non-radioactive toxins into the sea can lead to the bioaccumulation in ecosystems, particularly mud flats and salt marshes. The primary food source for the Common Scroter is Bivalves which bioaccumulate toxins very efficiently due to their filter feeding physiology. Reductions in water quality can alter the abundance, distribution and quality of prey items.
Risk of Likely Significant Effect (LSE)?	Given that prevailing wind directions are South Westerly along the West coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the North Wales Coast[1], radioactive and non-radioactive toxic discharges will be directed easterly towards Liverpool Bay SPA which overlaps with Menai Strait and Conwy Bay SAC. Despite the distance from nominated site at Wylfa the effects of toxic pollution are potentially significant.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

1 North West England and North Wales Shoreline Management Plan: Appendix C: Baseline Process Understanding http://mycoastline.org/documents/overview1.pdf

Liverpool Bay SPA Decommissioning (duration approx 30 years)	
Water Resources and Quality	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Liverpool Bay SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to the footprint of the site through decommissioning activities for example to accommodate waste storage or develop infrastructure.
Potential effects on the SPA: Receptor	Construction activities may alter the extent and quality of Liverpool Bay through the deposition of additional sediment loads transferred down the coast which may impact upon prey items of the Cormorant.
Risk of Likely Significant Effect (LSE)?	Any reduction in habitat and or extent may significantly affect foraging of the bird species at Liverpool Bay
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs**

Liverpool Bay SPA Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	Decommissioning of the existing nuclear power station at Wylfa **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Unknown
AA Required?	Yes

Liverpool Bay SPA Decommissioning (duration approx 30 years)	
Disturbance (Noise, light, visual)	
Potential Impacts: Pathway	Decommissioning activities (scheduled for up to 30 years) are likely to result in significant local increases in noise events, light pollution and visual disturbances in and around the vicinity of the nominated Site.
Potential effects on the SPA: Receptor	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success
Risk of Likely Significant Effect (LSE)?	Direct impacts on Liverpool Bay are unlikely however there is potential for indirect impacts through displacement of birds from sites nearer to Wylfa that are directly disturbed towards this SPA.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Disturbance through growth of new communities. **Welsh Coastal Tourism Strategy** – Disturbance through growth of new communities/ transport. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Disturbance through growth of new communities/ transport . **Isle of Anglesey Local Transport Plan -** Disturbance through growth of traffic. **Local Development Plan (The Ynys Môn)** - Disturbance through growth of development. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**

Liverpool Bay SPA Decommissioning (duration approx 30 years)	
Disturbance (Noise, light, visual)	
Risk from 'In Combination' Effects?	Decommissioning activities (scheduled for up to 30 years) are likely to result in significant local increases in noise events, light pollution and visual disturbances in and around the vicinity of the nominated Site.
AA Required?	Disturbance can impact upon foraging grounds for birds. Disturbance could result in displacement of birds from usual commuting routes, foraging and nesting grounds. Displacement from feeding and nesting sites may adversely impact upon species survival and long-term breeding success

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar

Authorities: Isle of Anglesey

Source: Construction (duration approx 5 years)

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Construction (duration approx 5 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from earthworks/excavations and infrastructure provision (sedimentation, pollution incidents through water courses and cycles).
Potential effects on the Ramsar: Receptor	Changes in organic and nutrient discharge and seepage into the catchment area can impact on fen communities including lakes, wet meadows and wet heaths and species they support within the Ramsar site which are highly sensitive to changes in water quality and nutrient loads. Earthworks and excavations can alter groundwater levels which may impact upon those designated communities within the Ramsar which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Water quality, nutrient levels and groundwater levels are key environmental conditions required for the maintenance of designated fen communities including lakes, wet meadows and wet heaths and species they support within the Ramsar site. Given the distance of the Ramsar site from the development site the impacts upon water quality arising from construction need to be further assessed to determine any significant effects.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development.

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Construction (duration approx 5 years)	
Water Resources and Quality	
	Gwynedd Structure Plan - Minerals –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Construction (duration approx 5 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth, and the emissions arising from construction activity. Likely to be restricted to a local level for example dust/ particulates
Potential effects on the Ramsar: Receptor	An increase in airborne pollutants can lead to nutrient loading and deposition within water sources which can impact upon designated fen communities including lakes, wet meadows and wet heaths and species they support within the Ramsar site.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for the habitats within the Ramsar site, although given the distance of the Ramsar site from the development site the impacts of emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this Ramsar site.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs**

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Construction (duration approx 5 years)	
Air Quality	
	Wales Transport Strategy Plan (2008) **Decommissioning of the existing nuclear power station at Wylfa**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Construction of the power station and related infrastructure, extension of site into 'buffer' habitats.
Potential effects on the Ramsar: Receptor	Changes in organic and nutrient discharge and seepage into the water catchment area can impact on designated fen communities including lakes, wet meadows and wet heaths and species they support within the Ramsar site which are highly sensitive to changes in water quality and nutrient loads. Earthworks and excavations can alter groundwater levels which may impact upon those designated communities within the Ramsar site which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Given the distance of the Ramsar site from the development site no direct impacts of loss and fragmentation of habitat and species will likely arise from the construction stage of the development
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Construction (duration approx 5 years)	
Habitat (and Species) Loss and Fragmentation	
	Local Development Plan (The Ynys Môn) - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wylfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Source: Operation (duration approx 60 years)

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Operation (duration approx 60 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential impacts on water quality and drainage from planned and accidental discharges (radioactive and non-radioactive), and from the abstraction and discharge of water for cooling (heated water up to 10^{o} warmer than the receiving environment).
Potential effects on the Ramsar: Receptor	Input of organic and nutrient discharge and seepage into the water catchment area can impact on designated fen communities including lakes, wet meadows and wet heaths and species they support within the Ramsar site which are highly sensitive to changes in water quality and nutrient loads. Abstraction removes water from the natural cycle, affecting groundwater supply to fen communities which are dependent on groundwater levels being maintained.
Risk of Likely Significant Effect (LSE)?	Impacts upon the Ramsar site of organic and nutrient loading arising from planned discharges need further investigation to determine whether changes are likely to be significant. Abstraction of water may result in impacts to hydrological regimes within this Ramsar site should abstraction of water be from the same catchment area as that feeding designated habitats within this Ramsar site.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land.

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Operation (duration approx 60 years)	
Water Resources and Quality	
	North Wales Regional Waste Plan – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Operation (duration approx 60 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth (nitrogen oxides, sulphur dioxide) are likely to be restricted to a local level for example dust/ particulates. Potential impacts from planned (argon-41, krypton-85 and tritium) and accidental radioactive emissions may impact on local and regional scales.
Potential effects on the Ramsar: Receptor	An increase in airborne pollutants can lead to nutrient loading. Indirect impacts include changes to water quality from aerial deposition. Changes in air quality can impact upon sensitive fen communities within this Ramsar site including lakes, wet meadows and wet heaths and upon those designated species they support.
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for the Ramsar site, although given the distance of the Ramsar site from the development site the impacts of planned emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this Ramsar site. Accidental radioactive emissions are unlikely given the level of regulatory control. Risk of significant effects of this is therefore unlikely
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport.

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Operation (duration approx 60 years)	
Air Quality	
	North Wales Regional Waste Plan – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs** **Wales Transport Strategy Plan (2008)** **Decommissioning of the existing nuclear power station at Wylfa**
Risk from 'In Combination' Effects?	Unlikely to be significant at this site.
AA Required?	No

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to footprint of site through operation, for example to accommodate waste storage, develop infrastructure may lead to the loss of supporting or buffer habitats. The construction and maintenance of permanent infrastructure such as roads, compound sites and waste storage facilities may result in fragmentation of habitats and reduce/alter available corridors for the movement of species across habitats and resources.
Potential effects on the Ramsar: Receptor	Additional construction activities May lead to increases in organic and nutrient discharge and seepage into the water catchment area. This can adversely impact on fen and other communities including lakes, wet meadows and wet heaths within the Ramsar site which are highly sensitive to changes in water quality and nutrient loads. Additional earthworks and excavations can also alter groundwater levels which may impact upon those designated communities within the Ramsar site which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Given the distance of the Ramsar site from the development no direct impacts of loss and fragmentation of habitat and species will likely arise from the construction stage of the development
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Operation (duration approx 60 years)	
Habitat (and Species) Loss and Fragmentation	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wylfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Unlikely to be significant at this site.
AA Required?	No

Source: Decommissioning (duration approx 30 years)

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Decommissioning (duration approx 30 years)	
Water Resources and Quality	
Potential Impacts: Pathway	Potential effects on water quality and drainage from [de]construction activities, earthworks, infrastructure, waste storage.
Potential effects on the Ramsar: Receptor	Contamination by synthetic and non-synthetic compounds and sediment input during deconstruction activities may result in nutrient loading, and its discharge into watercourses may lead to impacts upon designated fen communities including lakes, wet meadows and wet heaths and species they support within the Ramsar site.
Risk of Likely Significant Effect (LSE)?	The maintenance and management of existing hydrology is key to maintaining designated sites within the Ramsar site in favourable condition. Given the distance of the Ramsar site from the development site the impacts upon water quality arising from decommissioning need to be further assessed to determine whether catchment areas are shared and therefore whether impacts will be transferred to the Ramsar site.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats.

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Decommissioning (duration approx 30 years)	
Water Resources and Quality	
	Isle of Anglesey Local Transport Plan – Land take. **Local Development Plan (The Ynys Môn)** - Land take through growth.
Risk from 'In Combination' Effects?	Uncertain
AA Required?	Yes

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Decommissioning (duration approx 30 years)	
Air Quality	
Potential Impacts: Pathway	Potential local impacts from increased development/ traffic growth associated with decommissioning and the emissions arising from [de]construction activity. Likely to be restricted to a local level for example dust/ particulates.
Potential effects on the Ramsar: Receptor	An increase in airborne pollutants can lead to nutrient loading which can impact upon designated fen communities including lakes, wet meadows and wet heaths and species they support within the Ramsar site
Risk of Likely Significant Effect (LSE)?	Air quality is identified as a vulnerability for the Ramsar site, although given the distance of the Ramsar site from the development site the impacts of emissions arising from the development are likely to be local rather than diffuse and therefore unlikely to impact upon this Ramsar site.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** increase in communities, atmospheric pollution increase resulting from housing, employment and transport growth. **Welsh Coastal Tourism Strategy** – atmospheric pollution increase resulting from housing, employment and transport growth. **Ynys Mon Deposit Unitary Development Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **North Wales Regional Waste Plan** – increase in dust with industrial processes, diffuse air pollution due to increased transport. **Local Transport Plans, The Ynys Mon Local Plan, Gwynedd Structure Plan –** increased transport movements, contributing to atmospheric pollution loading. **The CCW 2002 Review of SPAs**

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Decommissioning (duration approx 30 years)	
Air Quality	
	Wales Transport Strategy Plan (2008) **Decommissioning of the existing nuclear power station at Wylfa**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
Potential Impacts: Pathway	Changes to footprint of site through decommissioning activities for example to accommodate waste storage, develop infrastructure.
Potential effects on the Ramsar: Receptor	Deconstruction activities can lead to increases in organic and nutrient discharge and seepage into the water catchment area. This can adversely impact on fen and other communities including lakes, wet meadows and wet heaths within the Ramsar site which are highly sensitive to changes in water quality and nutrient loads. Earthworks and excavations arising from deconstruction works can also alter groundwater levels which may impact upon those designated communities within the Ramsar site which are highly sensitive to such changes.
Risk of Likely Significant Effect (LSE)?	Given the distance of the Ramsar site from the development site no direct impacts of loss and fragmentation of habitat and species will likely arise from deconstruction.
Potential Impacts - other Plans and Programmes	**The Wales Spatial Plan –** Habitat loss (housing, employment, waste management, recreational pressures). **Welsh Coastal Tourism Strategy** – Habitat loss through development. **Gwynedd Structure Plan - Minerals** –land take through development and growth. **Ynys Môn Deposit Unitary Development Plan** – Direct loss of land. **North Wales Regional Waste Plan** – Direct loss of land, or indirect loss of surrounding habitats. **Isle of Anglesey Local Transport Plan** – Land take.

Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar Decommissioning (duration approx 30 years)	
Habitat (and Species) Loss and Fragmentation	
	Local Development Plan (The Ynys Môn) - Land take through growth. **Dwr Cymru Welsh Water draft Water Resources Management Plan** **The CCW 2002 Review of SPAs** **Decommissioning of the existing nuclear power station at Wylfa** **Ynys Enli to Llandudno Shoreline Management Plan**
Risk from 'In Combination' Effects?	Uncertain
AA Required?	No

Appendix 4: HRA/ Appropriate Assessment Proforma

Bae Cemlyn/ Cemlyn Bay SAC

- **Location: 04 30 40 W/ 53 24 42 N**
- **Size (ha): 43.43**
- **Designation: SAC**

	Bae Cemlyn/ Cemlyn Bay SAC
Qualifying Features	Annex I habitats that are a primary reason for selection of this site 1150 Coastal lagoons Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: 1220 Perennial vegetation of stony banks
Conservation Objectives	The interest features will be considered to be in favourable conservation status when, subject to natural processes, each of the following conditions are satisfied: **Interest Feature 1: Coastal Lagoon** • There is no loss of area other than that due to natural processes. • The specialised plant and animal communities within the lagoon remain. • All factors affecting the achievement of these conditions are under control. **Interest Feature 2: Perennial Vegetation of Stony Banks** • The extent of the vegetation of shingle banks is maintained unless altered by natural (for example storm) events. • Typical component species of vegetation of shingle banks are maintained.

	Bae Cemlyn/ Cemlyn Bay SAC
	• Invasive alien species (for example Japanese knotweed *Fallopia japonica*) are absent. • The management of activities or operations likely to damage or degrade the population dynamics, natural range and supporting habitat of the feature is appropriate for maintaining favourable conservation status and is secure in the long-term.
Key Environmental Conditions (factors that maintain site integrity)	**Coastal Lagoon** • Managing land use change in the catchment, for example, intensive dairy or arable farming have the potential to influence water quality. Sediment load, chemical (nutrient) and organic pollution could also affect the water quality within the lagoon. • Managing the freshwater inflow, seepage through the shingle and leakage through the weir to maintain the salinity balance within the lagoon. **Perennial Vegetation of Stony Banks** • The shingle ridge is maintained through a dynamic and generally cyclic process of deposition and erosion of the shingle. Structures or other intervention that interfere with this natural movement should be resisted. Removal of shingle to provide building materials must also be resisted.
Vulnerabilities (includes existing pressures and trends) ***Details in Appendix 1***	Designated habitats are vulnerable to: • Fish and Shellfish Aquaculture • Fishing • Invasive species • Pollution • Eutrophication • Coastal erosion and sea level rise • Management of water levels • Reclamation of land from sea/estuary or marsh

	Bae Cemlyn/ Cemlyn Bay SAC
	• Physical disturbance of the seabed. • Climate change and sea level rise • Anthropogenic activity and coastal development • Natural mobility of sediment and sediment supply • Exploitation of shingle • Access and recreation impacts • Grazing • Air pollution
Predicted Impacts ***What are the issues arising from the plan and how might the site be affected?***	**Water Resources and Quality** • Increased/ altered drainage from earthworks and excavation • Potential for toxic contamination from accidental leakage • Radioactive discharges (accidental and routine) • Alteration of flow from abstraction • Changes to water temperature from controlled discharge • Sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases **Habitat (and Species) Loss and Fragmentation** • Direct loss of coastal lagoon and stony bank habitats for which the SAC is designated for through general construction and deconstruction activities and where encroachment upon the coastal fringe is necessary • Fragmentation from encroachment onto surrounding habitats during construction of the nuclear power station and related infrastructure required during the construction and decommissioning phases • Loss of habitat arising from encroachment of the development into the coastal fringe resulting in erosion or accretion of designated habitats

	Bae Cemlyn/ Cemlyn Bay SAC
	Coastal Squeeze • Reduction of the coastal margin through encroachment of the development footprint onto the coastal fringe leading to alterations in sediment transport regimes which can impact upon coast morphology. **Air Quality** • Local level impacts (reduced air quality arising from increased emissions from road/ transport/ generation sources) arising from construction and decommissioning activities can result in deposition in the coastal lagoon, altering nutrient levels and acidity • Accidental radioactive discharges
Potential In-combination effects (screening) ***What other plans and programmes could lead to in-combinations effects?***	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those identified issues (for example Catchment Abstraction Management Strategies). **Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa **Habitat (and Species) Loss and Fragmentation**

	Bae Cemlyn/ Cemlyn Bay SAC
	• The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynsys Enli to Llandudno Shoreline Management Plan **Coastal Squeeze** • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynsys Enli to Llandudno Shoreline Management Plan **Air Quality** • The CCW 2002 Review of SPAs • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Wales Transport Strategy Plan (2008)

	Bae Cemlyn/ Cemlyn Bay SAC
	• Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa
Appropriate Assessment **Likelihood of adverse effect on integrity:**	**Water Resources and Quality** • "Key Environmental Conditions (factors maintaining site integrity)" (Appendix 1, Site Characterisations) listed for this SAC further indicate that alterations to sediment load, nutrient loading and freshwater inflow will likely have adverse impacts upon the ecological integrity of the coastal lagoon, whilst additional barriers which impact upon the natural cyclic processes of deposition and erosion will also likely degrade the vegetation communities of stony banks. • Radioactive discharges are subject to targets monitored by the EA, with nitrate contributions considered to be the most significant of the non-radioactive discharges (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges. • Current Environment Agency data[6] states that the ecological status of the coastal waters surrounding this SAC and Nominated site is in 'good' status. Cemlyn lagoon itself, although not assessed, is considered to achieve a good or better ecological potential by 2015, due particularly to its hydromorphology. The groundwater quantity status around the SAC and Nominated site (Ynys Mon Minor) is considered by the EA to be of 'good' status, with elements contributing to this rating including water balance, saline intrusion and impacts upon wetlands and surface waters. The chemical status of the groundwater body Ynys Mon Minor is currently considered to be 'poor', although the EA anticipate this status to increase to 'good' by 2027. Groundwater quantity status is expected to remain 'good' by 2015. Rivers feeding into the catchment area covering both the SAC and Nominated site include the River Wygyr, which is considered to be in 'good' overall and

[6] Environment AgencyDraft River Basin Management Plan: Western Wales River Basin District, 2008: The data used in this assessment is taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time. Draft plans were presented to the Government for approval in September 2009, with final plans published in December 2009.

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	ecological status, this rating anticipated to remain by 2015. • Given that water abstraction requirements, mechanisms used during abstraction and quality of discharge arising from the development of Nominated site are currently unknown, it is not possible to conclude that no adverse impacts upon water quality will occur at Cemlyn Bay SAC. **Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze** • Coastal lagoons and perennial vegetation of stony banks habitats designated within Cemlyn Bay SAC are currently in 'favourable maintained' and 'unfavourable' condition respectively. Alterations in deposition and erosion processes alongside trampling are thought to be key factors in preventing stony bank habitat from recovering towards a favourable condition. • According to projections by the UK Climate Change Impacts Programme In Wales[7], it is predicted that by 2050 net sea level change, after taking into account general subsidence rates around the Welsh coastline, could be between 26.5 to 35.5cm and 71cm. A report by the National Trust[8] in 2007 further states that Cemlyn Lagoon is at risk of disappearing altogether as a result of coastal erosion and flooding exacerbated by rising sea levels leading to coastal squeeze impacts. Although much of the coast proposed for development at Nominated site comprises hard rock cliffs less susceptible to erosion[2], the construction of off-site infrastructure (for example road and rail links) in addition to direct land take may result in the loss of buffer habitats adjacent to Cemlyn Bay SAC and coastal squeeze impacts, should the development encroach upon the lower lying areas at Cemlyn Bay SAC. • In the Conservation Status Assessments by the JNCC for each of the designated habitats within this SAC (H1150 Coastal lagoons and H1220 Perennial vegetation of stony banks)[9], main pressures and threats identified relate to increased nutrient loading causing eutrophication and alterations in sediment transport and hydrology regimes leading to coastal erosion and disturbance to the freshwater-saline balance. The latter impacts are likely to specifically arise from increasing coastal

[7] Wales: Changing Climate, Challenging choices – a scoping study of climate change impacts in Wales (May 2000) http://www.ukcip.org.uk/images/stories/Pub_pdfs/wales_tech.pdf
[8] Shifting Shores. (National Trust 2007) http://www.nationaltrust.org.uk/main/w-global/w-localtoyou/w-wales/w-wales-news/w-wales-news-shifting_shores.htm
[9] http://www.jncc.gov.uk/pdf/Article17

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	development including coastal defence works which are likely to be exacerbated by sea level rise. • The extent of the loss and/or fragmentation of marine and terrestrial habitats from the construction of nuclear reactors, construction areas and other infrastructure and facilities relating to the operation of the nuclear power station is currently unknown, given that the exact scope of the development and the requirements for coastal or sea defence infrastructure remain undetermined at this stage. However given the proximity of this SAC to the Nominated site (650m away), it is likely that adverse impacts upon this SAC including coastal squeeze impacts leading to habitat loss and fragmentation will arise as a result of the proposed development at Nominated site. **Air Quality** • Information provided by the UK Air Pollution Information System (APIS)[10] indicate that the designated habitats within Cemlyn Bay SAC, including Coastal lagoon and Perennial vegetation of stony banks are highly sensitive to nitrogen loads, with atmospheric deposition likely to result in increased nutrient loading within these habitats. • Information provided by the Welsh Air Quality Forum[11] indicates that air quality for the Isle of Anglesey is generally good with low levels of ozone, nitrogen dioxide and PM_{10} levels (fine particulate matter) relative to the rest of Wales. • The EA assesses that non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority. The Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.[12] • Air quality issues around Nominated site will arise during construction and decommissioning phases, although the extent of such impacts remains unknown. Given that air pollution is an identified

[10] http://www.apis.ac.uk/
[11] Air Quality in Wales: Website of the Welsh Air Quality Forum http://www.welshairquality.co.uk/trend.php?t=4
[12] Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).

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	vulnerability for these designated habitats within this SAC, the potential for significant adverse impacts to occur at Cemlyn Bay SAC therefore cannot be ruled out.
Possible Avoidance and Mitigation Measures – *includes recommendations for policy/proposals*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[13] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted. • The use of cooling towers instead of direct intake methods used in cooling water intake should be considered if environmental impacts arising from the use of cooling towers (whereby additional land take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of

[13] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

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	the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed. **Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze** • Direct loss and fragmentation of habitat (and species) arising from land take from the development of the new nuclear power station together with induced and ancillary infrastructure can be effectively mitigated against by the implementation of a number of key mitigation requirements. These include: – a requirement for the site layout/ design to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for habitat connectivity of wildlife corridors around the site and around induced/ ancillary developments to be maintained and enhanced to reduce the extent of indirect impacts arising from direct land take at these developments; – a requirement for the avoidance of adverse environmental impacts arising from general construction/ operation/ deconstruction activities through the safe operation and decommissioning of the development and of interim waste storage management; – a requirement for adequate ecological mitigation and construction environmental management plans to be produced for the site to minimise further direct and indirect impacts upon habitats and species (such as disturbance, pollution, run-off and drainage etc.), and for such plans to link to existing integrated land and coastal management plans. The interest features and conservation objectives of the designated sites should guide the identification of potential mitigation and compensation measures. – In addition, the reinstatement of a non-working railtrack connecting to the existing power station could reduce the need for additional infrastructure during construction, operation and

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	decommissioning, whilst a proposed 3rd crossing over the Menai strait could further reduce pressures on the existing transport infrastructure. • Avoidance and/or mitigation against any additional losses and fragmentation of habitats and species resulting from the movement of coastal habitat due to changes to the geomorphological processes at the coastal frontage of the site and beyond (as a result of maintenance of/ improvements to existing coastal defences and the construction of additional defences and a marine off-loading facility), is required. Effective mitigation measures include: – a requirement for the layout/ design of additional sea defence measures and marine off-shore landing facilities to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for ecological mitigation and construction environmental management plans to ensure the protection of the coastal fringe and for such plans to link to existing integrated coastal management plans; – a requirement for the consultation of strategic coastal management documents such as the CHaMP, Shoreline Management Plan (and the developing SMP2) and Flood Risk Strategy when determining the location and type of coastal defence required and where such efforts should be concentrated; and – a requirement for other soft engineering techniques such as managed retreat and foreshore recharge to be considered as possible flood defence techniques. • In addition, the construction and generation of physical, chemical and thermal barriers to the migration, commuting and dispersal of fish and bird species will require adequate mitigation to ensure no adverse impacts upon the integrity of European sites. Effective mitigation will require the following to ensure no adverse effects on site integrity is likely: – a requirements for works areas to be screened appropriately with height restrictions implemented where necessary to limit disturbance impacts upon migratory paths;

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	– a requirement for the minimisation of the extent of cooling water culverts and that modern tunnelling and discharge techniques are applied to reduce the impact of thermal plumes; – a requirement for the height of cooling towers (if required) to be kept to a minimum height considered practicable; and – a requirement for the incorporation of fish protection measures within the cooling water intake/system design. **Air Quality** • Whilst air quality impacts are not assessed as being a significant vulnerability at Cemlyn Bay SAC it is appropriate that potential air quality impacts arising from developments are addressed as part of the development plan process. Requirements should include the following: – a requirement that sustainable transport plans are available which include the requirement for the use of non-road transport where possible; – a requirement for the phasing of the development to minimise emissions and dust generation; a requirement for the use of carbon-efficient forms of transport and construction during the power station lifecycle; – a requirement for emissions to be off set where appropriate; – a requirement for appropriate air quality management plans to be implemented, with recommendations for mitigation and avoidance to take into account the potential for cumulative impacts where phasing between the existing power station and the new build overlap such that no adverse impacts upon site integrity will occur. – In addition, the reinstatement of a non-working railtrack connecting to the existing power station could reduce the need for additional infrastructure during construction, operation and decommissioning, whilst a proposed 3rd crossing over the Menai strait could further reduce pressures on the existing transport infrastructure. • The assessment has noted that radioactive emissions from the current nuclear power station around

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	Wylfa are low and are strictly controlled through regulation and the risk assessments undertaken for the consenting process. However additional measures are required to ensure no adverse impacts upon site integrity will occur. These measures include: – a requirement for management measures/ plans relating to emissions to be in place prior to site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments; – a requirement for all recommendations for mitigation and avoidance within management plans to take into account the potential for cumulative impacts where phasing between the existing power station and the new build overlaps; – a requirement to seek opportunities to offsett emissions where appropriate; – a requirement for radioactive emissions to be As Low As Reasonably Achievable (ALARA) [14] with non-radioactive emissions expected to be an improvement upon existing standards; and – the requirement that any emissions which lead to adverse effects on the integrity of European sites will not be permitted by the relevant regulatory authority
Conclude no adverse effect on integrity?	• It is not possible at this stage of the development of the Nuclear NPS to say that proposals at Wylfa will not have significant adverse effects on Cemlyn Bay SAC as a result of impacts to water resources and quality, loss or fragmentation of habitat and species, impacts arising from coastal squeeze or impacts upon air quality.

[14] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

Site Name: Glannau Ynys Gybi/ Holy Island Coast SAC

- **Location: 53 18 06 N/ 04 41 18 W**
- **Size (ha): 464.27**
- **Designation: SAC**

	Glannau Ynys Gybi/ Holy Island Coast SAC
Qualifying Features	Annex I habitats that are a primary reason for selection of this site: 1230 Vegetated sea cliffs of the Atlantic and Baltic coasts 4030 European dry heaths Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: 4010 Northern Atlantic wet heaths with Cross-leaved Heath *Erica tetralix*
Conservation Objectives	The interest features will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: **Interest Feature 1: Vegetated sea cliffs of the Atlantic and Baltic coasts (including cliff and crevice vegetation, maritime grassland and maritime heath)** • Cliff and crevice vegetation, maritime grassland and maritime heath occurs throughout the site in appropriate areas and their relative extent and zonation are determined by topography, exposure, grazing and natural stochastic events (for example, storms). • The cliff vegetation is composed of native plants such as Sea spurrey *Spergularia rupicola, S*ea lavenders *(Limonium britannicum, L procerum, L. binervosum)* and Sea sapphire *Crithmum maritimum*. • Non-native plants, such as Hottentot fig *Carpobrotus edulis* or Purple dew-plant *Disphyma*

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	crassifolium are preferably absent or at least not spreading from their 2000 extent. • Maritime Grassland occupies higher ledges on the coastal cliffs and the cliff-top. • The following plants are common in the maritime grassland: Red fescue *Festuca rubra*, Thrift *Armeria maritima;* Spring squill *Scilla verna* and Sea plantain *Plantago maritima* • Maritime Heathland occupies areas inland of the maritime grassland. • The following plants are common in the maritime heathland: Heather *Calluna vulgaris*; Bell heather *Erica cinerea* Western gorse *Ulex gallii,* Thrift, Sea plantain, Buck's-horn plantain *Plantago coronopus* or Spring squill. • Competitive species indicative of under-grazing, particularly Bracken *Pteridium aquilinum* and Gorse *Ulex europaeus* and grass species indicative of improvement including Creeping bent *Agrostis stolonifera,* Cock's foot *Dactylus glomerata,* Perennial rye-grass *Lolium perenne* and Yorkshire fog *Holcus lanatus* are largely absent from the heath. • Sustainable populations of the plants which make up the Atlantic sea cliff rare plant assemblage will be present, notably, South Stack fleawort *Tephroseris integrifolia*, Sea lavenders, Golden hair lichen *Teloschistes flavicans* and Ciliate strap lichen *Heterodermia leucomelos.* **Interest Feature 2: European dry heaths** • Dry heath covers no less than the present mapped extent (*to be determined*). • The following plants are common in the dry heath: Heather, Bell heather, Western gorse.

	Glannau Ynys Gybi/ Holy Island Coast SAC
	• Competitive species indicative of under-grazing, particularly Bracken, Purple moor-grass *Molinia caerulea* and Western gorse are kept in check. • 70% of dry heath will be "good condition" dry heath. • The dry heath provides abundant and accessible food for breeding Chough *Pyrrhocorax pyrrhocorax.* • The dry heath supports sustainable (flowering) populations of Dodder *Cuscuta epithymum*. • Spotted rock rose *Tuberaria Guttata* occurs in at least 5 distinct loci (presently South Stack, Porth Dafarch north, Porth y Garan, Pany yr Hyman path, Pant yr Hyman heath) of at least 200 plants each. • Juniper *Juniperus communis* occurs in at least 3 locations totalling 50 plants. • The dry heath supports a viable population of Silver studded blue *Plebeius argus*. **Interest Feature 3. Northern Atlantic wet heaths with *Erica tetralix*** • Wet heath covers no less than the present mapped extent (*to be determined*). • The following plants are common in the wet heath: Heather, Cross-leaved heath, Bog moss *Sphagnum* spp., Devil's bit scabious *Succisa pratensis* and Bog asphodel *Narthecium ossifragum.* • Competitive species indicative of under-grazing, particularly Bracken, Purple moor-grass and Western gorse are kept in check.

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	• 70% of wet heath will be "good condition" wet heath. • The wet heath supports sustainable (flowering) populations of Marsh gentian *Gentiana pneumonanthe*, Three-lobed water crowfoot *Ranunuclus tripartitus*, and Pillwort *Pilularia globulifera*. • The wet heath supports a viable population of Bog bush cricket *Metrioptera brachyptera* and contributes potential support of a meta-population of Marsh fritillary *Euphydryas aurinia*. The performance indicators can be found within the Glannau Ynys Gybi SAC and SPA Core Management Plan.
Key Environmental Conditions (factors that maintain site integrity)	• **Grazing** – Light grazing should be maintained to remove excess herbage, encourage the maintenance and development of dwarf shrub heath and maritime grasslands and control the development of scrub. • **Burning** –- Burning can rejuvenate heathland and creates opportunities for germination of marsh gentians. However, over-frequent burning impoverishes the invertebrate fauna and encourages gorse and purple moor-grass. It should be used as a tool to encourage correct grazing, not as a primary tool to control the vegetation. • **Low soil fertility** – No fertilisers of any kind should be applied. Low soil fertility helps heather and western gorse to compete against more aggressive agricultural grasses. • **Water quality** – The wet heath should be kept moist by precipitation and seepages, and should not be subject to run-off from agricultural activities such as fertiliser application. It could still be affected by airborne pollutants such as lime drift from adjoining farmland or nitrous oxides from hydrocarbon combustion. • **Scrub control** – Small patches of scrub should be tolerated on site since they provide shelter and nest sites for a variety of insects, birds and other animals. If burning and grazing are unsuccessful in limiting scrub distribution, it may be necessary to cut back European Gorse, Birch and Willow to

	Glannau Ynys Gybi/ Holy Island Coast SAC
	prevent it encroaching on the heathland areas. • **Public access, anthropogenic activity and development** – Significant disturbance attributable to human activities can result in displacement from foraging, roosting and breeding sites of Chough and other bird species, leading to reduced food intake and/or increased energy expenditure. Management of recreational activities (walking, climbing, cycling access) is required to prevent erosion/ disturbance.
Vulnerabilities (includes existing pressures and trends) ***Details in Appendix 1***	**Factors affecting Vegetated sea cliffs of the Atlantic and Baltic coasts:** • Erosion • Coastal protection • Built development • Agriculture • Recreational use • Introduced species • Grazing • Air pollution **Factors affecting European Dry Heaths and Northern Atlantic Wet Heaths with *Erica tetralix*:** • Over-grazing • Under-grazing • Invasive species • Development pressures • Burning • Air pollution • Water management
Predicted Impacts	**Water Resources and Quality** • Radioactive discharges (accidental and routine)

	Glannau Ynys Gybi/ Holy Island Coast SAC
What are the issues arising from the plan and how might the site be affected?	• Sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases
Potential In-combination effects (screening) ***What other plans and programmes could lead to in-combinations effects?***	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those identified issues (for example Catchment Abstraction Management Strategies). **Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa
Appropriate Assessment **Likelihood of adverse effect on integrity:**	**Water Resources and Quality** • Current Environment Agency data[15] show the ecological and chemical status of the coastal waters adjacent to Holy Island Coast SAC to be 'good' and anticipate this to be maintained by 2015. The EA considers the ecological and chemical potential of the heavily modified water body of shallow sea separating Holy Island from the Isle of Anglesey to be of 'moderate' status, and the expect these

[15] Environment Agency Draft River Basin Management Plan: Western Wales River Basin District, 2008: The data used in this assessment is taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time. Draft plans were presented to the Government for approval in September 2009, with final plans published in December 2009.

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	ratings to increase to 'good' ecological potential and 'good' chemical status by 2027 and 2015 respectively. • Groundwater quantity and chemical quality around Holy Island Coast SAC are assessed by the EA as being 'good' and 'poor' respectively. • Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges. • Given that prevailing wind directions are south-westerly along the west coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the north Wales Coast[16], any increases in nutrient loading through discharge of synthetic and non-synthetic toxic compounds will likely be directed away from this SAC, such that impacts upon those sensitive habitats designated within this SAC will likely be minimal. • Moreover water abstraction requirements at Nominated site are not expected to adversely impact upon sensitive habitats within this SAC given that groundwater and river catchment areas remain distinct between Holy Island and the Isle of Anglesey and are separated by a narrow channel of shallow sea.
Possible Avoidance and Mitigation Measures – *includes recommendations for policy/proposals*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with

[16] North West England and North Wales Shoreline Management Plan: Appendix C: Baseline Process Understanding http://mycoastline.org/documents/overview1.pdf

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	existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[17] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted. • The use of cooling towers instead of direct intake methods used in cooling water intake should be considered if environmental impacts arising from the use of cooling towers (whereby additional land take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed.
Conclude no adverse effect on integrity?	No adverse effects upon the ecological integrity of Holy Island Coast SAC arising from changes to water resources quality are anticipated as a result of the proposed nuclear development at Wylfa.

[17] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

Site Name: Corsydd Môn / Anglesey Fens SAC

- **Location: 53 18 45 N/ 04 17 44 W**
- **Size (ha): 467.19**
- **Designation: SAC**

	Corsydd Môn / Anglesey Fens SAC
Qualifying Features	Annex I habitats that are a primary reason for selection of this site: Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* Alkaline fens Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: Northern Atlantic wet heaths with *Erica tetralix* *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*) Annex II species that are a primary reason for selection of this site: Geyer`s whorl snail *Vertigo geyeri* Annex II species present as a qualifying feature, but not a primary reason for site selection: Southern damselfly *Coenagrion mercuriale* Marsh fritillary butterfly *Euphydryas* (*Eurodryas*, *Hypodryas*) *aurinia*
Conservation Objectives	The interest features will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: **Interest Feature 1: Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.** • Open water occupies not less than 1% of the total site area.

	Corsydd Môn / Anglesey Fens SAC
	• Natural deep lakes persist at Cors Goch and Cors Erddreiniog component sites. • The macrophyte, phytoplankton, zooplankton and predator components of the ecosystem operate in balance in a clear-water environment, where: Characteristic macrophyte species are present in the water bodies, including dense beds of Stoneworts (*Chara* spp), in areas <6m deep. • Invasive non-native species are absent, or occur at no more than rare or occasional frequency. • Locally native (non-coarse) fish are present. • All coarse fish are absent. • Water quality is such as to maintain pH 7-9 and mean annual Total Phosphorus <15µg/l. • The water is clear throughout the year, with an absence of algal blooms. • Marl deposition occurs within all the lakes. • There is minimal extraneous sediment input. • The integrity of the natural hydrological system (inputs and outputs) is intact. • Appropriate water level is maintained throughout the year, (seasonal fluctuation 30cm). **Interest Feature 2: Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae*** • Calcareous fen occupies at least 20% (93ha) of the total site area. • Calcareous fen is over at least 5 of the 7 sites including Cors Erddreiniog, Cors Bodeilio, Cors Goch, Gwenfro-Rhos Y Gad and Cors Y Farl. • Calcareous fen exhibits a range of condition states (see below) in which Great fen sedge *Cladium* is frequent to dominant, with no less than 10% referable to species-poor *Cladium* swamp and the remainder to either vegetation in which *Cladium* occurs with Sweet gale *Myrica gale*, Blunt flowered rush *Juncus subnodulosus*, Purple moor-grass *Molinia caerulea* and Cross-leaved heath *Erica tetralix*, or vegetation with many of the above elements as well as bog-bean *Menyanthes trifoliata* marsh cinquefoil *Potentilla palustris,* Bladderwort *Utricularia vulgaris*, and Slender sedge *Carex lasiocarpa* and other small sedges. • Species indicative of drainage or agricultural modification, such as Yorkshire fog *Holcus lanatus*, Bramble *Rubus spp*., Nettle *Urtica dioica* are largely absent from the calcareous fen.

	Corsydd Môn / Anglesey Fens SAC
	• Purple moor-grass does not exceed 25% of ground cover. • Leaf Litter forms no more than 20% of the ground cover at any location. • Scrub species such as Willow *Salix* and Birch *Betula* are largely absent from the calcareous fen. • *Rhododendron spp*. is absent. • Standing surface water is present or expressible on footfall over most of the winter period. • Groundwater is within 15cm of surface in mid summer. • All hydrological (diffuse, surface and sub-surface) pathways (inputs and outputs) are restored and/or intact (includes ditch infilling, blocking, diversion and re-engineering). Water quality reflects the base-rich but nutrient-poor requirements of the habitat. **Interest Feature 3: Alkaline fen** • Alkaline fen occupies at least 17% of the total site area. • Alkaline fen is found on all 7 component sites. • The following plants are common in the alkaline fen: Black bog rush *Schoenus nigricans*, Moss *Campyllium stellatum*, Great fen sedge (up to 1m tall), Blunt flowered rush *Juncus subnodulosus*, Sweet gale *Myrica gale*, Moss *Drepanocladus revolvens,* Bladderwort, Butterwort *Pinguicula vulgaris*. • Species indicative of drainage or agricultural modification, such as Yorkshire fog, Bramble and Nettle are largely absent from the alkaline fen Purple moor grass *Molinia caerulea* does not exceed 25% of ground cover and is restricted to drier areas. • Bare ground including tufa constitutes about 10% of the ground cover. • Alkaline Fen exhibits a diverse age and height structure across the site (tussocks are undamaged and 20% short grazed, 50% mature – 30% in between including bare ground). • Scrub species such as Willow and Birch are largely absent from the alkaline fen. • *Rhododendron spp*. is absent. • Water expressible on foot-fall or running surface water is present between tussocks throughout the year. • All hydrological (diffuse, surface and sub-surface) pathways (inputs and outputs) should be restored and/or intact (includes ditch infilling, blocking, diversion and re-engineering).

	Corsydd Môn / Anglesey Fens SAC
	• Water quality is appropriate to the needs of the vegetation and species. **Interest Feature 4: Northern Atlantic wet heaths with *Erica tetralix*** • Wet heath covers at least 4%ha of the site • The following plants are common in the wet heath: Heather, Cross-leaved heath *Erica tetralix* as well as Bog moss *Sphagnum* spp., Devil's bit scabious *Succisa pratensis* and Bog asphodel. • Competitive species indicative of under-grazing, particularly Bracken, Purple moor-grass and Western gorse will be kept in check. • 70% of wet heath will be "good condition" wet heath. • The wet heath supports viable populations of Marsh gentian at Cors Erddreiniog. • The wet heath contributes to the support of a viable meta-population of Marsh fritillary. **Interest Feature 5: *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils** • Molinia meadows occupy at least 2% of the total site area. • Molinia meadows are distributed over at all 7 component sites. • The following plants are common in the Molinia meadows: Purple moor-grass, Devil's bit scabious, Carnation sedge *Carex panacea, S*aw wort *Serratula tinctoria,* Lousewort *Pedicularis sylvestris*, *Carex pulicaris* and C. *hostiana and* Marsh orchids *Dactylorhiza* sp.. • Soft rush *Juncus effusus* and species indicative of agricultural modification, such as Perennial rye • grass *Lolium perenne* and White clover *Trifolium repens* are largely absent from the *Molinia* Meadows. • Purple moor-grass does not exceed 50% of ground cover. • Scrub species such as Willow and Birch are largely absent from the Molinia meadows. • *Rhododendron spp.* are absent. • Leaf litter should comprise <25% of ground cover. • Groundwater will be between –10cm and –25cm below ground level for most of the year. • The integrity of the hydrological system (inputs and outputs) will be intact. • Swards structure should reflect the requirements of Marsh fritillary.

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	Interest Feature 6: <u>Geyer`s whorl snail</u> • There are abundant areas of flushed fen grassland (M13 / feature 2) with sedge/moss lawns 5-15cm tall, containing species such as *Carex viridula* subsp. *brachyrrhyncha*, *Pinguicula vulgaris, Briza media, Equisetum palustre, Juncus articulatus* and the mosses *Drepanocladus revolvens, Campylium stellatum,* with scattered tussocks of *Schoenus nigricans* no greater than 80cm tall. • Soils are saturated *schoenus* tussocks lower than 80cm. **Interest Feature 7: <u>Southern damselfly</u>** • Population size is stable or increasing. • The population occupies at least 3 distinct management units. • The total area of good breeding habitat does not fall below 1000m^2. • Seepages and shallow runnels at Nant Isaf will be clear, pollution free and will support good numbers of native aquatic plants. • The population of Southern damselflies on the site (allowing for normal annual fluctuations) is maintained or increases. • Species indicative of drainage or agricultural modification, such as Yorkshire fog, Bramble, and Nettle are largely absent. • Alkaline Fen habitat exhibits a diverse age and height structure across the site (tussocks are undamaged and 20% short grazed, 50% mature – 30% in between including bare ground. • Scrub species such as Willow and Birch are largely absent from the alkaline fen habitat. • *Rhododendron spp*. is absent from the feature. • Appropriate grazing is managed across 100% of the site. • Standing or running surface water is present between tussocks throughout the year, and visible over 30% of the tussock covered area. • All hydrological (diffuse, surface and sub-surface) pathways (inputs and outputs) should be restored and/or intact (includes ditch infilling, blocking, diversion and re-engineering). • Water quality is appropriate to the needs of the vegetation and species.

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	Interest Feature 8: Marsh fritillary butterfly • The site supports a sustainable meta population of the Marsh fritillary. • The population is viable in the long term, (acknowledging the extreme population fluctuations of the species). • Habitats on the site are in optimal condition to support the metapopulation. • At least 6% (approximately 30ha) of the total site area is marshy grassland or wet heath suitable for supporting Marsh fritillary, with Devil's-bit scabious *Succisa pratensis* present and only a low cover of scrub. • At least 40% of this 30ha is good Marsh fritillary breeding habitat, dominated by purple moor-grass with *S. pratensis* abundant throughout and a vegetation height of 10-20cm over the winter period. • Areas of good marsh fritillary habitat are scattered over several management units. • Off site habitats that function as stepping stone or corridors located between SAC compartments will be maintained for migration, dispersal, foraging and genetic exchange purposes.
Key Environmental Conditions (factors that maintain site integrity)	• **Drainage** - Water Level Management Plans are in preparation by the Environment Agency supported and advised by CCW. • **Water abstraction –** Abstraction levels need to be managed to prevent loss of area through drainage and conversion to intensive agriculture impact upon alkaline fens. Excessive water abstraction can dry up aquifers and reduce spring line flows, leading to lowered water tables. Abstractions can also affect the natural balance between the differing water qualities of ground water and surface water. • **Water management and quality** - The management of surface and groundwater is crucial to providing the surface:groundwater requirements of each type of fen, as are its constituents, for example basic ions such as calcium, its pH, and quantity of the plant nutrients nitrogen and phosphorus. Water quality and quantity within the lakes are crucial factors determining their survival. • **Grazing** –Management agreements or direct management by conservation agencies (namely CCW and North Wales Wildlife Trust) are seeking to reinstate grazing with cattle or ponies, scrub and reed cutting and in some instances possibly peat-cutting, to slow down or in places reverse successional

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	change. • **Burning -** Burning regimes, traditionally a management tool for management of moorland should be reintroduced appropriately to rejuvenate heathland and create opportunities for germination. • **Nutrient enrichment** – Pollution of water supplies, especially by agricultural run-off of nitrate and phosphate, threatens the site with eutrophication which can lead to substantial adverse changes to key plant communities. • **Air pollution** - Airborne nitrogen inputs are an insidious but long-term threat. Nitrogen deposition is of particular concern for oligotrophic water bodies, especially where there are elevated phosphate levels.
Vulnerabilities (includes existing pressures and trends) ***Details in Appendix 1***	Main pressures and threats for Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp. • Pollution • Air pollution • Sea level rise Main pressures and threats for Calcareous fens with *Cladium mariscus* and species of the *Caricion davallianae* • Water abstraction • Grazing • Fragmentation • absence of or inappropriate management • pollution (though air pollution is not considered to be a threat) • climate change Main pressures and threats for Alkaline fens • Water abstraction • Grazing • Burning

	Corsydd Môn / Anglesey Fens SAC
	• Fragmentation • Absence of or inappropriate management • Pollution • Air pollution <u>Main pressures and threats for Northern Atlantic wet heaths with *Erica tetralix*</u> • Grazing • Invasive species • Development pressures • Burning • Water management • Air pollution <u>Main pressures and threats for *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils</u> • Grazing • Lack of remedial management • Water management and quality • Agricultural improvement • Air pollution • invasive species • too frequent burning • agricultural abandonment • development • afforestation <u>Main pressures and threats for the Geyer`s whorl snail</u> • Drainage • grazing

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	• modification of cultivation practices <u>Main pressures and threats for the Southern damselfly</u> • Inappropriate heathland management • agricultural drainage and water pollution • dredging of breeding sites <u>Main pressures and threats for the Marsh fritillary butterfly</u> • Cultivation, mowing and cutting • use of pesticides and fertilisers • grazing pressures and changes in agricultural management • planting and scrub encroachment • burning and soil pollution/nutrient enrichment • drainage • development • recreation
Predicted Impacts ***What are the issues arising from the plan and how might the site be affected?***	**Water Resources and Quality** • Alteration of flow from abstraction • Potential for toxic contamination from accidental leakage • Radioactive discharges (accidental and routine) • Changes to water temperature from controlled discharge
Potential In-combination effects (screening)	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those identified issues (for example Catchment Abstraction Management Strategies).

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What other plans and programmes could lead to in-combinations effects?	**Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa
Appropriate Assessment **Likelihood of adverse effect on integrity:**	**Water Resources and Quality** • 7 of the 8 qualifying features of this SAC are currently considered to be in unfavourable declining condition, whilst North Atlantic wet heath habitats within this SAC, also in unfavourable condition, remains unclassified as to whether it is showing any sign of improvement or further decline. Furthermore, "Key Environmental Conditions (factors maintaining site integrity)" (Appendix 1, Site Characterisations) for this SAC indicate that any alterations to drainage and abstraction regimes will lead to the loss of area through drainage and lowered water tables, whilst also affecting the natural balance between ground and surface water feeding these designated habitats. Any changes to water quality will also detrimentally impact designated habitats and species supported within this SAC by altering the delicate balance of constituent ions and nutrients required for its maintenance. • Currently water abstraction requirements and the mechanisms used during abstraction are currently unknown. Radioactive discharges are subject to targets monitored by the EA, with nitrate contributions considered to be the most significant of the non-radioactive discharges (research cited

	Corsydd Môn / Anglesey Fens SAC
	by the EA in the nuclear sector report). • Current EA data[18] state that current water quality status (where assessed) of the rivers within the catchment area of the SAC range between 'moderate' to 'good' status with regards to both their chemical and ecological status. The EA anticipate these water bodies to achieve an overall 'good' status by 2015 (River Ceint and Afon Nodwydd) or 2027 (River Lligwy, Afon Goch). • The EA also state that groundwater quantity and chemical quality around this SAC are assessed by the EA as being 'good', with elements contributing to this status being water balance and its impact upon wetlands and surface waters. Moreover given that the groundwater body covering the Anglesey Fens (Ynys Mon central Carboniferous Limestone) is distinct from that covering Nominated site (Ynys Mon Minor), increased levels of abstraction at Nominated site are not considered to significantly impact upon the groundwater levels at Anglesey Fens SAC.
Possible Avoidance and Mitigation Measures – *includes recommendations for policy/proposals*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[19] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted. • The use of cooling towers instead of direct intake methods used in cooling water intake should be

[18] Environment Agency Draft River Basin Management Plan: Western Wales River Basin District, 2008: The data used in this assessment is taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time. Draft plans were presented to the Government for approval in September 2009, with final plans published in December 2009.

[19] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

	Corsydd Môn / Anglesey Fens SAC
	considered if environmental impacts arising from the use of cooling towers (whereby additional land take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed.
Conclude no adverse effect on integrity?	• It is considered unlikely for the development of a nuclear power station at Wylfa to have adverse effects upon the integrity of Anglesey Fens SAC as a result of impacts to water resources and quality.

Site Name:Llyn Dinam SAC

Location: 53 18 89 N/ 04 32 03 W
Size (ha): 36.69
Designation: SAC

	Llyn Dinam SAC
Qualifying Features	Annex I habitats that are a primary reason for selection of this site: Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation
Conservation Objectives	The interest features will be considered to be in favourable condition when, subject to natural processes, each of the following conditions are met: **Interest Feature 1: Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation** • There is no loss of area other than that due to natural processes (succession). • The aquatic plant community is typical of this lake type in terms of composition and structure. • Plants indicating very high nutrient levels and/or excessive silt loads are not dominant. • Invasive non-native water plants do not threaten to out-compete the native flora. • Invasive non-native fauna do not threaten the native flora and/or fauna. • Bird species listed as SSSI features continue to be present at m1% of UK populations. • The nutrient, pH and dissolved oxygen levels are typical for a lake of this type and there is no excessive growth of cyanobacteria or green algae. • Chlorophyll • values are low, and sufficient to allow Llyn Dinam and Llyn Penrhyn to be passed as 'Good' or better for an 'high alkalinity shallow lake' using Water Framework Directive classification methods http://www.wfduk.org/management_info/News/UKCLASSPUB/. • The fringing swamp and mire vegetation is maintained.

	Llyn Dinam SAC
	• The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future.
Key Environmental Conditions (factors that maintain site integrity)	The site should continue to support a clear-water aquatic plant community characterised by a wide variety of pondweeds, while the lakes persist. Reedswamp and fen should support, amongst other things, Marsh fern, while providing suitable habitat for breeding and wintering wildfowl and other wetland birds. The mixture of lakes, ponds, ditches and other water habitats; together with the reedbeds, marshland, scrub and wet grassland, should display the process of natural succession from open water to marshy grassland.
Vulnerabilities (includes existing pressures and trends) ***Details in Appendix 1***	• Water levels • Water quality • Nutrient inputs • Air pollution • Sea level rise • Fish populations/angling • Grazing • Recreational use • Invasive species
Predicted Impacts ***What are the issues arising from the plan and how might the site be affected?***	**Water Resources and Quality** • Alteration of flow from abstraction • Potential for toxic contamination from accidental leakage • Radioactive discharges (accidental and routine) • Changes to water temperature from controlled discharge
Potential In-combination effects	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those

	Llyn Dinam SAC
(screening) ***What other plans and programmes could lead to in-combinations effects?***	identified issues (for example Catchment Abstraction Management Strategies). **Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa
Appropriate Assessment **Likelihood of adverse effect on integrity:**	**Water Resources and Quality** • Natural eutrophic lakes, the primary qualifying feature of this SAC are currently considered to be in unfavourable unclassified condition due to the limited presence of pondweed species indicative of such lake types and the high levels of phosphorous exceeding acceptable levels. This habitat is considered to be in recovery should catchment input levels be maintained. Furthermore, "Key Environmental Conditions (factors maintaining site integrity)" (Appendix 1, Site Characterisations) for this SAC indicate that any alterations to drainage and abstraction regimes will lead to the loss of area through drainage and lowered water tables affecting inflow and outflow streams. Any increases in nutrient discharge, particularly of phosphorous will also detrimentally impact upon water quality of the designated habitat and species supported. • Currently water abstraction requirements and the mechanisms used during abstraction are unknown. Radioactive discharges are subject to targets monitored by the EA, with nitrate contributions considered to be the most significant of the non-radioactive discharges (research cited by the EA in the nuclear sector report).

	Llyn Dinam SAC
	• Current EA data[20] state that the overall and ecological status of Llyn Dinam lake is 'poor'. Elements responsible for this rating include the phytobenthos and invertebrate communities, with phytobenthos communities expecting to remain 'poor' and invertebrate communities expected to increase to 'moderate' status by 2015. The EA anticipate the overall status and ecological status of Llyn Dinam lake to increase to a 'good' status by 2027. Adjacent coastal waters to the west of Llyn Dinam SAC are considered by the EA to be in good ecological, chemical and overall status, and to remain so by 2015. • The EA also state that groundwater quantity around this SAC are of 'good' status, with elements contributing to this including water balance, its impact upon wetlands and surface waters, and saline intrusion. The chemical status of the groundwater around this SAC however is considered to be 'poor''. Both groundwater quantity status and chemical status are anticipated to increase to a rating of 'good' by 2027. • Although the groundwater body covering Llyn Dinam SAC is shared with that covering Nominated site (Ynys Mon Minor), its distance away from Nominated site (more than 15km away) and the clear distinction between river water body catchment areas covering Nominated site and Llyn Dinam SAC (with at least 5 other river water body catchment areas lying between Nominated site and this SAC) together suggest that any adverse impacts arising from the development at Nominated site upon water quality will not likely result in significant adverse impacts upon the ecological integrity of Llyn Dinam SAC.
Possible Avoidance and Mitigation Measures – *includes*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water

[20] Environment Agency Draft River Basin Management Plan: Western Wales River Basin District, 2008: The data used in this assessment is taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time. Draft plans were presented to the Government for approval in September 2009, with final plans published in December 2009.

	Llyn Dinam SAC
recommendations for policy/proposals	Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[21] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted. • The use of cooling towers instead of direct intake methods used in cooling water intake should be considered if environmental impacts arising from the use of cooling towers (whereby additional land take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed.

[21] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

	Llyn Dinam SAC
Conclude no adverse effect on integrity?	• It is considered unlikely for the proposals for nuclear development at Wylfa to result in adverse effects upon the integrity of Llyn Dinam SAC arising from impacts to water resources and quality.

Site Name: Y Fenai a Bae/Menai Strait and Conwy Bay SAC

- **Location: 04 03 18 W/ 53 14 04 N**
- **Size (ha): 26,483**
- **Designation: SAC**
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	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
Qualifying Features	Annex I habitats that are a primary reason for selection of this site: 1110 Sandbanks which are slightly covered by sea water all the time 1140 Mudflats and sand flats not covered by seawater at low tide 1170 Reefs Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site: 1160 Large shallow inlets and bays 8330 Submerged or partially submerged sea caves
Conservation Objectives	**Interest Feature 1: Sandbanks which are slightly covered by sea water all the time** **Interest Feature 2: Mudflats and sand flats not covered by seawater at low tide** **Interest Feature 3: Reefs** **Interest Feature 4: Large shallow inlets and bays** **Interest Feature 5: Submerged or partially submerged sea caves** To achieve favourable conservation status all of the following, subject to natural processes, need to be fulfilled and maintained in the long-term. If these objectives are not met then restoration measures will be needed to achieve favourable conservation status. The overall distribution and extent of the habitat features within the site, and each of their main component parts should also be stable or increasing. **Interest Feature 1: Sandbanks which are slightly covered by sea water all the time; Interest Feature 2: Mudflats and sand flats not covered by seawater at low tide:** Muddy gravel communities

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
	Dwarf eelgrass, Zostera noltei beds Sediment communities at Traeth Lafan **Interest Feature 3: Reefs** • Reef communities in high energy wave-sheltered, tide-swept conditions • Under-boulder, overhang and crevice communities • Limestone reef communities • Clay outcrop reef communities **Interest Feature 4: Large shallow inlets and bays:** • Organically enriched muddy sediment areas Other conservation objectives for designated features within this SAC include the following: • The physical biological and chemical structure and functions necessary for the long-term maintenance and quality of the habitat are not degraded. Important elements include; geology, sedimentology, geomorphology, hydrography and meteorology, water and sediment chemistry, and biological interactions. • Nutrient levels in the water column and sediments to be at or below existing statutory guideline concentrations, and within ranges that are not potentially detrimental to the long term maintenance of the features species populations, their abundance and range. • Contaminant levels in the water column and sediments derived from human activity to be at or below existing statutory guideline concentrations and below levels that would potentially result in increase in contaminant concentrations within sediments or biota. They should also be below levels potentially detrimental to the long-term maintenance of the features species populations, their abundance or range. • Some reef features such as under boulder, overhang and crevice communities, and of some mudflat and sand flat features such as the muddy gravel habitats and sheltered muddy habitats require

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
	restoration and/or recovery. All of these habitats are also part of the large inlets and bays feature. • The presence, abundance, condition and diversity of typical species are such that habitat quality is not degraded. Important elements include: species richness, population structure and dynamics, physiological heath, reproductive capacity, recruitment, mobility and range. • Populations of typical species subject to existing commercial fisheries need to be at an abundance equal to or greater than that required to achieve maximum sustainable yield and secure in the long term. • The management and control of activities or operations likely to adversely affect the habitat feature, is appropriate for maintaining it in favourable condition and is secure in the long term.
Key Environmental Conditions (factors that maintain site integrity)	**Feature 1-5: 1) Sandbanks, 2) Mudflats and Sand flats, 3) Reefs, 4) Large shallow inlets and bays, 5) Submerged/ partially submerged sea caves:** The maintenance of the following pressures at tolerable levels are required to ensure site integrity is retained: • Fisheries • Coastal development and other disturbances • Climate change • Non-indigenous species • Wasting disease of eelgrass beds • Coastal erosion/sea level rise • Water Quality ▪ Offshore disturbance
Vulnerabilities (includes existing	Designated habitats within this SAC are vulnerable to the following threats and pressures: ▪ Fish and Shellfish Aquaculture

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
pressures and trends) ***Details in Appendix 1***	▪ Fishing ▪ Sand and gravel extraction and other exploration ▪ Pollution and discharges ▪ Eutrophication ▪ Modification of marine currents arising from sea defence or coast protection works ▪ Coastal erosion and removal of sediments ▪ Invasive and non-indigenous species ▪ Wasting disease of eelgrass beds ▪ Physical disturbance of the seabed and sandbanks such as through dredging and trawling ▪ Coastal and offshore development and other disturbances ▪ Climate Change ▪ Water quality ▪ Disturbance to the hydrological regime
Predicted Impacts ***What are the issues arising from the plan and how might the site be affected?***	**Water Resources and Quality** • Increased/ altered drainage from earthworks and excavation • Potential for toxic contamination from accidental leakage • Radioactive discharges (accidental and routine) • Changes to water temperature from controlled discharge • Sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases **Habitat (and Species) Loss and Fragmentation** • Loss of habitat arising from encroachment of the development into the coastal fringe resulting in erosion or accretion of designated habitats **Coastal Squeeze**

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
	• Reduction of the coastal margin through encroachment of the development footprint onto the coastal fringe leading to alterations in sediment transport regimes which can impact upon coast morphology.
Potential In-combination effects (screening) ***What other plans and programmes could lead to in-combinations effects?***	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those identified issues (for example Catchment Abstraction Management Strategies). **Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa **Habitat (and Species) Loss and Fragmentation** • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
	• Ynsys Enli to Llandudno Shoreline Management Plan **Coastal Squeeze** • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynsys Enli to Llandudno Shoreline Management Plan
Appropriate Assessment **Likelihood of adverse effect on integrity:**	**Water Resources and Quality** • Current EA data[22] show the ecological and chemical status of the coastal waters around this SAC to be 'good'. Conwy Bay in particular is considered to be in 'good' status in regards to its ecological and chemical health, and is expected to remain in 'good' status by 2015. The ecological status of the Menai Strait has yet to be assessed, although its chemical status is 'good' and is expected to remain so by 2015. Groundwater chemical status and quantity status around this SAC are assessed by the EA as being 'good', and is expected to remain so by 2015. • Radioactive discharges are subject to targets monitored by the EA and of the non-radioactive discharges, nitrate contributions are considered to be the most significant (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges.

[22] Environment Agency Draft River Basin Management Plan: Western Wales River Basin District, 2008: The data used in this assessment is taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time. Draft plans were presented to the Government for approval in September 2009, with final plans published in December 2009.

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
	• The EA consider the coastal water body type of the SAC located within 20km of Nominated site to be 'moderately exposed and macro tidal, becoming more sheltered further southwards. Given that the prevailing wind directions are south-westerly along the west coast of Wales, and that wave-induced sediment and littoral transport is eastwards along the north Wales Coast[23], any increases in sediment and nutrient loading during construction and operation will likely be directed towards this SAC, leading to changes in deposition and erosion regimes at sensitive habitats designated within this SAC. • The ecological integrity of this SAC is dependant upon the maintenance of hydrology and nutrient levels. With the majority of the habitats designated within this SAC being depositional habitats - sandbanks, mud flats, sand flats and shallow inlets and bays - the communities and rare species they support will likely be particularly sensitive to increases in nutrient loading through the discharge of synthetic and non-synthetic toxic compounds. Given that mud flat, sand flat and shallow inlet and bay habitats in particular are currently in unfavourable condition, significant impacts are likely to arise as a result in reductions in water quality at Nominated site. • Water abstraction requirements at Nominated site are not expected to have any significant effects upon the hydrology of these sensitive habitats within this SAC, as its distance away from the proposed development (more than 15km away) ensures that groundwater and river catchment areas remain distinct between the SAC and Nominated site. **Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze** • In the Conservation Status Assessments by the JNCC for each of the designated habitats within this SAC[24], the main pressures and threats relate to alterations in sediment transport and hydrology regimes arising from development of the coastline and construction of sea defences. Habitats designated within this SAC are habitat complexes comprising an interdependent mosaic of sub tidal and intertidal habitats rich in animal and plant communities. Such habitats and the biotic

[23] North West England and North Wales Shoreline Management Plan: Appendix C: Baseline Process Understanding http://mycoastline.org/documents/overview1.pdf
[24] http://www.jncc.gov.uk/pdf/Article17

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
	communities they support depend upon the maintenance of nutrient deposition levels and sediment transport regimes. Greater concentrations of nutrients deposited within these habitats can lead to the creation of abiotic areas or in the production of algal mats which can have detrimental impacts upon the physical structure and upon the biotic communities they support. Increases in sediment load can also impact upon reef communities by affecting the turbidity of the water resulting in reduced light penetration with direct adverse impacts upon seaweed communities. • The extent of the loss and/or fragmentation of marine and terrestrial habitats from the construction of nuclear reactors, construction areas and other infrastructure and facilities relating to the operation of the nuclear power station is currently unknown given that the exact scope of the development and the requirements for coastal or sea defence infrastructure remain undetermined at this stage. The significance of habitat and species loss arising from such development in the context of wider habitat changes and sensitivities therefore cannot be assessed. At this strategic stage where detailed development plans are unknown, it is therefore not possible to conclude that no adverse impacts upon the SAC will arise from impacts of coastal squeeze occurring at Nominated site, leading to indirect habitat loss and fragmentation.
Possible Avoidance and Mitigation Measures – *includes recommendations for policy/proposals*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[25] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted.

[25] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
	• The use of cooling towers instead of direct intake methods used in cooling water intake should be considered if environmental impacts arising from the use of cooling towers (whereby additional land take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed. **Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze** • Direct loss and fragmentation of habitat (and species) arising from land take from the development of the new nuclear power station together with induced and ancillary infrastructure can be effectively mitigated against by the implementation of a number of key mitigation requirements. These include: – a requirement for the site layout/ design to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for habitat connectivity of wildlife corridors around the site and around induced/

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
	ancillary developments to be maintained and enhanced to reduce the extent of indirect impacts arising from direct land take at these developments; – a requirement for the avoidance of adverse environmental impacts arising from general construction/ operation/ deconstruction activities through the safe operation and decommissioning of the development and of interim waste storage management; – a requirement for adequate ecological mitigation and construction environmental management plans to be produced for the site to minimise further direct and indirect impacts upon habitats and species (such as disturbance, pollution, run-off and drainage etc.), and for such plans to link to existing integrated land and coastal management plans. The interest features and conservation objectives of the designated sites should guide the identification of potential mitigation and compensation measures. – In addition, the reinstatement of a non-working railtrack connecting to the existing power station could reduce the need for additional infrastructure during construction, operation and decommissioning, whilst a proposed 3rd crossing over the Menai strait could further reduce pressures on the existing transport infrastructure. • Avoidance and/or mitigation against any additional losses and fragmentation of habitats and species resulting from the movement of coastal habitat due to changes to the geomorphological processes at the coastal frontage of the site and beyond (as a result of maintenance of/ improvements to existing coastal defences and the construction of additional defences and a marine off-loading facility), is required. Effective mitigation measures include: – a requirement for the layout/ design of additional sea defence measures and marine off-shore landing facilities to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for ecological mitigation and construction environmental management plans to ensure the protection of the coastal fringe and for such plans to link to existing integrated coastal management plans;

	Y Fenai a Bae/Menai Strait and Conwy Bay SAC
	– a requirement for the consultation of strategic coastal management documents such as the CHaMP, Shoreline Management Plan (and the developing SMP2) and Flood Risk Strategy when determining the location and type of coastal defence required and where such efforts should be concentrated; and – a requirement for other soft engineering techniques such as managed retreat and foreshore recharge to be considered as possible flood defence techniques. • In addition, the construction and generation of physical, chemical and thermal barriers to the migration, commuting and dispersal of fish and bird species will require adequate mitigation to ensure no adverse impacts upon the integrity of European sites. Effective mitigation will require the following to ensure no adverse effects on site integrity is likely: – a requirements for works areas to be screened appropriately with height restrictions implemented where necessary to limit disturbance impacts upon migratory paths; – a requirement for the minimisation of the extent of cooling water culverts and that modern tunnelling and discharge techniques are applied to reduce the impact of thermal plumes; – a requirement for the height of cooling towers (if required) to be kept to a minimum height considered practicable; and – a requirement for the incorporation of fish protection measures within the cooling water intake/system design.
Conclude no adverse effect on integrity?	• It is not possible at this stage of the development of the Nuclear NPS to say that the development of a nuclear power station at Wylfa will not have adverse effects upon the integrity of the Menai Strait and Conwy Bay SAC as a result of impacts to water resources and quality, habitat (and species) loss and fragmentation, or coastal squeeze.

Site Name: Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar

- **Location: 53 18 45 N/ 04 17 44 W**
- **Size (ha): 629.9**
- **Designation: Ramsar**

	Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar
Qualifying Features	**Ramsar criterion 1** • Hard oligo-mesotrophic waters with benthic vegetation of *Chara sp.* • Molinia meadows on calcareous, peaty or clayey— silt-laden soils (*Molinion caeruleae)* • Calcareous fens with *Cladium mariscus* and species of the *Caricion davallinae* • Alkaline fens • Geyer's Whorl Snail *Vertigo geyeri* • Southern damselfly *Ceonagrion mercuriale* • Marsh Fritillary butterfly *Euphydryas* (*Eurodryas, Hypodryas) aurinia* • Northern Atlantic wet heaths with *Erica tetralix* **Ramsar Criterion 3** The site supports a diverse flora and fauna with associated rare species and is of special value for maintaining the genetic and ecological diversity of the region. Noteworthy flora include: Higher plants: • Narrow-leaved marsh orchid *Dactylorhiza traunsteineri* • Slender cottongrass *Eriophorum gracile* Lower plants*:* • Dwarf Stonewort *Nitella tenuissima*

	Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar
	Noteworthy fauna include: Invertebrates: • Geyer's whorl snail *Vertigo geyeri* (Habitats Directive Annex II) • Desmoulin's whorl snail *Vertigo moulinsiana* (Annex II (Habitats Directive; RDB3) • Southern damselfly *Coenagrion mercuriale* (Habitats Directive Annex II) • Marsh fritillary *Euphydryas aurinia* (Habitats Directive Annex II) • Ground beetle *Chlaenius tristis* (RDB1) • Hornet robber fly *Asilus crabroniformis* (Notable) • Soldier fly *Stratiomys chamaeleon*, Parasitic fly *Acrometopia wahlbergi*, Medicinal leech *Hirudo medicinalis* (Habitats Directive Annex V) Mammals: • Otter *Lutra lutra* (Habitats Directive Annex II)
Conservation Objectives	• Refer to Anglesey Fens SAC.
Key Environmental Conditions (factors that maintain site integrity)	• Refer to Anglesey Fens SAC.
Vulnerabilities (includes existing pressures and trends) ***Details in Appendix 1***	• Refer to Anglesey Fens SAC.
Predicted Impacts ***What are the issues arising from the plan***	**Water Resources and Quality** • Alteration of flow from abstraction • Potential for toxic contamination from accidental leakage • Radioactive discharges (accidental and routine)

	Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar
and how might the site be affected?	• Changes to water temperature from controlled discharge
Potential In-combination effects (screening) ***What other plans and programmes could lead to in-combinations effects?***	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those identified issues (for example Catchment Abstraction Management Strategies). **Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa
Appropriate Assessment **Likelihood of adverse effect on integrity:**	**Water Resources and Quality** • 7 of the 8 qualifying features under Ramsar criterion 1 of this Ramsar site are currently considered to be in unfavourable declining condition. The 8th feature, North Atlantic wet heath habitats, whilst also in unfavourable condition, remains unclassified as to whether it is showing any sign of improvement or further decline. Furthermore, "Key Environmental Conditions (factors maintaining site integrity)" (Appendix 1, Site Characterisations) for this Ramsar site indicate that any alterations to drainage and abstraction regimes will lead to the loss of area through drainage and lowered water tables, whilst also affecting the natural balance between ground and surface water feeding these designated habitats. Any changes to water quality will also detrimentally impact designated habitats and species supported within this Ramsar site by altering the delicate balance of constituent ions and nutrients

	Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar
	required for its maintenance. • Currently water abstraction requirements and the mechanisms used during abstraction are unknown. Radioactive discharges are subject to targets monitored by the EA, with nitrate contributions considered to be the most significant of the non-radioactive discharges (research cited by the EA in the nuclear sector report). • Current EA data[26] state that water quality status (where assessed) of the rivers within the catchment area of the Ramsar site range between 'moderate' to 'good' status with regards to both their chemical and ecological status. The EA anticipate these water bodies to achieve an overall 'good' status by 2015 (for Rivers Ceint and Afon Nodwydd) or by 2027 (for Rivers Lligwy, Afon Goch). • The EA also state that groundwater quantity and chemical quality around the Ramsar site are assessed as being 'good', with elements contributing to this status being water balance and its impact upon wetlands and surface waters. Moreover given that the groundwater body covering the Anglesey Fens Ramsar site (Ynys Mon central Carboniferous Limestone) is distinct from that covering Nominated site (Ynys Mon Minor), increased levels of abstraction at Nominated site are not considered likely to significantly impact upon the groundwater levels at Anglesey and Llyn Fens Ramsar site.
Possible Avoidance and Mitigation Measures – *includes recommendations for policy/proposals*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with

[26] Environment Agency Draft River Basin Management Plan: Western Wales River Basin District, 2008: The data used in this assessment is taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time. Draft plans were presented to the Government for approval in September 2009, with final plans published in December 2009.

	Corsydd Môn a Llyn / Anglesey and Llyn Fens Ramsar
	existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[27] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted. • The use of cooling towers instead of direct intake methods used in cooling water intake should be considered if environmental impacts arising from the use of cooling towers (whereby additional land take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed.
Conclude no adverse effect on integrity?	• It is considered unlikely for the development of a nuclear power station at Wylfa to result in adverse effects upon the integrity of the Anglesey and Llyn Fens Ramsar site arising from impacts to water resources and quality.

[27] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

Site Name: Ynys Feurig, Cemlyn Bay and The Skerries SPA

- **Location: 04 30 40 W/ 53 24 42 N**
- **Size (ha): 85.66**
- **Designation: SPA**

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
Qualifying Features	This site qualifies under **Article 4.1** of the Directive (79/409/EEC) by supporting populations of European importance of the following species listed on Annex I of the Directive: **During the breeding season:** • Arctic Tern *Sterna paradisaea*, 1,290 pairs representing at least 2.9% of the breeding population in Great Britain (5 year mean, 1992-1996) • Common Tern *Sterna hirundo*, 189 pairs representing at least 1.5% of the breeding population in Great Britain (5 year mean, 1992-1996) • Roseate Tern *Sterna dougallii*, 3 pairs representing at least 5.0% of the breeding population in Great Britain (5 year mean, 1992-1996) • Sandwich Tern *Sterna sandvicensis*, 460 pairs representing at least 3.3% of the breeding population in Great Britain (5 year mean, 1993-1997)
Conservation Objectives	• The interest features will be considered to be in favourable conservation status when, subject to natural processes, each of the following conditions are satisfied: • **Interest Feature 1-4: Breeding population of Terns**

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	• The number of breeding terns within the SPA is stable or increasing. • The number of chicks successfully fledged in the SPA and beyond is sufficient to help sustain the population. • The range and distribution of terns within the SPA and beyond is not constrained or hindered. • The extent of supporting habitats used by terns is stable or increasing. • Supporting habitats are of sufficient quality to support the requirements of terns. • There are appropriate and sufficient food sources for terns within access of the SPA. • Actions or events likely to impinge on the sustainability of the population are under control.
Key Environmental Conditions (factors that maintain site integrity)	• Provision of alternative nest sites (boxes) • Predator control (Foxes *Vulpes vulpes* and avian predators) • Managing recreation (walking, climbing, canoeing cycling access) to prevent disturbance
Vulnerabilities (includes existing pressures and trends) ***Details in Appendix 1***	The SPA is subdivided into three distinct areas which are used at various times as breeding sites by the Irish Sea Roseate Tern populations, though may be deserted for a period of years while other sites are more favoured, for reasons unknown. Currently Rockabill Island in Dunlin Bay is the favoured breeding location. The three islands within the SPA continue to support important colonies of Arctic, Common and Sandwich Terns. Roseate Terns spend much of their lifespan away from these breeding colonies and are therefore vulnerable to pressures beyond the control of the site managers; including factors affecting food supply, winter survival etc. Recreational pressures at Cemlyn Bay arise from the promotion of the coastal footpath which passes close to the colonies and requires 24 hour wardens to guide the public below the skyline. Other colonies suffer occasional disturbance from inadvertent public access and also require wardens. Ground predators (Stoat *Mustela erminea* and Fox *Vulpes vulpes*) require regular control at Cemlyn Bay and Ynys Feurig. Peregrine falcons *Falco peregrinus* and rogue gulls have caused mortality and desertion of colonies on some occasions. Theft of eggs by collectors continues to be a threat.

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	Close co-operation, research and monitoring of the Irish Sea Roseate Tern population are maintained through the Interreg Programme.
Predicted Impacts ***What are the issues arising from the plan and how might the site be affected?***	**Water Resources and Quality** Reductions in water quality arising from the below impacts listed can impact upon fish populations which are fed upon by bird species designated within this SPA: • Increased/ altered drainage from earthworks and excavation leading to increased sediment loading • Potential for toxic contamination from accidental leakage • Radioactive discharges (accidental and routine) • Alteration of flow from abstraction • Changes to water temperature from controlled discharges • Sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases **Habitat (and Species) Loss and Fragmentation** • Direct loss of terrestrial, marine and intertidal habitats upon which designated bird species within the SPA depend through general construction and deconstruction activities and where encroachment upon the coastal fringe is necessary • Fragmentation from encroachment onto surrounding habitats during construction of the nuclear power station and related infrastructure required during the construction and decommissioning phases • Impingement of fish and larvae on water intake filters during abstraction • Loss of habitat arising from encroachment of the development into the coastal fringe resulting in erosion or accretion of designated habitats **Coastal Squeeze**

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	• Reduction of the coastal margin through encroachment of the development footprint onto the coastal fringe leading to alterations in sediment transport regimes which can impact upon coast morphology. **Air Quality** • Local level impacts (reduced air quality arising from increased emissions from road/ transport/ generation sources) arising from construction and decommissioning activities can result in deposition in the coastal lagoon, altering nutrient levels and acidity • Accidental radioactive discharges **Disturbance (noise, light and visual)** Local level impacts arising from construction and decommissioning activities can impact upon over wintering and breeding birds for which the site is designated
Potential In-combination effects (screening) ***What other plans and programmes could lead to in-combinations effects?***	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those identified issues (for example Catchment Abstraction Management Strategies). **Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	Habitat (and Species) Loss and Fragmentation • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynsys Enli to Llandudno Shoreline Management Plan **Coastal Squeeze** • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynsys Enli to Llandudno Shoreline Management Plan **Disturbance** • The CCW 2002 Review of SPAs • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993)

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	• Unitary Development Plan (unadopted 2005) • Wales Transport Strategy Plan (2008) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa **Air Quality** • The CCW 2002 Review of SPAs • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Wales Transport Strategy Plan (2008) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa
Appropriate Assessment **Likelihood of adverse effect on integrity:**	**Water Resources and Quality** • Current Environment Agency data[28] states that the ecological status of the coastal waters surrounding this SPA and Nominated site is in 'good' status. Cemlyn lagoon, although not assessed, is considered to achieve a good or better ecological potential by 2015, due particularly to its hydromorphology. The coastal waters of The Skerries are currently considered to be 'good' in regards to its overall status and ecological status, these ratings anticipated to remain the same in 2015. The groundwater quantity status around this SPA and Nominated site (Ynys Mon Minor) is considered by the EA to be of 'good' status, with elements contributing to this rating including water balance, saline intrusion and impacts upon wetlands and surface waters. The chemical status of the

[28] Environment Agency Draft River Basin Management Plan: Western Wales River Basin District, 2008: The data used in this assessment is taken from the Draft River Basin Management Plan, which was the most up to date plan available at the time. Draft plans were presented to the Government for approval in September 2009, with final plans published in December 2009.

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	groundwater body Ynys Mon Minor is currently considered to be 'poor', although the EA anticipate this status to increase to 'good' by 2027. Groundwater quantity status is expected to remain 'good' by 2015. Rivers feeding into the catchment area covering both the SPA and Nominated site include the River Wygyr, which is considered to be in 'good' overall and ecological status, these ratings anticipated to remain unchanged in 2015. • Radioactive discharges are subject to targets monitored by the EA, with nitrate contributions considered to be the most significant of the non-radioactive discharges (research cited by the EA in the nuclear sector report). In particular it is noted that there can be measurable localised impacts on sea nutrient levels in the vicinity of discharges. Increases in nutrient loading through the discharge of synthetic and non-synthetic toxic compounds can directly impact upon fish populations, impacting upon food availability and quality upon which designated Tern species depend. Furthermore toxins accumulating within fish can be transferred to Tern species via the food chain. • Given that water abstraction requirements, mechanisms used during abstraction and quality of discharge arising from the development of Nominated site are currently unknown, it is not considered possible to determine that no adverse impacts upon water resources and quality will occur at Ynys Feurig, Cemlyn Bay and The Skerries SPA as a result of the proposed development at Nominated site. **Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze** • Breeding populations of Arctic, Common, and Sandwich Terns designated within this SPA are currently considered to be in a 'favourable maintained' condition, whilst breeding populations of Roseate Terns (also designated within this SPA) are in 'unfavourable, unchanged' condition. The lack of appropriate nesting sites (Roseate Terns need protected and enclosed nesting sites compared with the open nesting site requirements of the other species) are a key factor in preventing breeding populations of this species from moving towards a 'favourable condition'. Other specific vulnerabilities (Appendix 1, Site Characterisations) identified for these designated bird species include the availability of appropriate and sufficient food sources and habitat which affect their breeding and

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	winter survival rates. • According to projections by the UK Climate Change Impacts Programme In Wales[29], it is predicted that by 2050 net sea level change after taking into account general subsidence rates around the Welsh coastline, could be between 26.5 to 35.5cm and 71cm. A report by the National trust[30] in 2007 further states that Cemlyn Lagoon which support designated bird species within this SPA is at risk of disappearing altogether as a result of coastal erosion and flooding exacerbated by rising sea levels leading to coastal squeeze impacts. Although much of the coast proposed for development at Nominate Site comprises hard rock cliffs less susceptible to erosion[2], the construction of off-site infrastructure (for example road and rail links) in addition to direct land take may result in the loss of buffer habitats adjacent to Ynys Feurig, Cemlyn Bay and The Skerries SPA and coastal squeeze impacts, particularly should the development encroach upon the lower lying areas around Cemlyn Bay. Long term changes in sea-surface temperature arising from climate change may also be partly responsible for the consistent and continued decline of fish stocks, for example *Sardinella* species in coastal West Africa and the Gulf of Guinea[31]. As the winter progresses, *Sardinella* become less available to terns in this region and the whereabouts of Roseate Terns and the composition of their diet in the December to May period remains unknown. • In the CCW Core Management Plan for this SPA[32] the main pressures and threats identified for these designated bird species relate to reductions in food and nesting habitat resources. Adverse impacts to areas of scrub, coastal lagoons and salt marshes, marshy and coastal grassland, maritime cliff and associated ledges and crevices in particular are likely to impact directly upon the tern species designated within this SPA, with such impacts arising as a result of increased nutrient

[29] Wales: Changing Climate, Challenging choices – a scoping study of climate change impacts in Wales (May 2000) http://www.ukcip.org.uk/images/stories/Pub_pdfs/wales_tech.pdf
[30] Shifting Shores. (National Trust 2007) http://www.nationaltrust.org.uk/main/w-global/w-localtoyou/w-wales/w-wales-news/w-wales-news-shifting_shores.htm
[31] Core Management Plan for Cemlyn Bay and The Skerries SPA (CCW 2008) http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/bae-cemlyn--cemlyn-bay-sac.aspx
[32] Core Management Plan for Cemlyn Bay and The Skerries SPA (CCW 2008) http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/bae-cemlyn--cemlyn-bay-sac.aspx

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	loading causing eutrophication as well as alterations in sediment transport and hydrology regimes leading to coastal erosion and disturbance to the freshwater-saline balance. These latter impacts are likely to specifically arise from increasing coastal development including coastal defence works which are likely to be exacerbated by sea level rise. • Impacts of nutrient loading and changes to water quality as discussed earlier may also detrimentally affect fish populations. There is also evidence to suggest that cetaceans can be significant in driving fish to the surface where they then become an available food source to terns[33]. Any impacts arising from the development at Nominated site may therefore potentially impact upon cetacean populations (for example through alterations in coastal morphology or the creation of barriers off-shore such as marine landing platforms), which may have knock-on effects upon designated bird species within this SPA. • The extent of the loss and/or fragmentation of marine and terrestrial habitats supporting designated bird species within this SPA (as a result of the construction of nuclear reactors, construction areas and other infrastructure and facilities relating to the operation of the nuclear power station) is currently unknown given that the exact scope of the development and the requirements for coastal or sea defence infrastructure remain undetermined. However given the proximity of this SPA to Nominated site (650m away), it is likely that adverse impacts upon this SPA including coastal squeeze impacts leading to habitat loss and fragmentation will arise as a result of the proposed development at Nominated site. • The operation of the power station has implications associated with impingement of fish on the cooling water intake screens, and also entrainment of fish eggs and larvae (ichthyoplankton).

[33] Core Management Plan for Cemlyn Bay and The Skerries SPA (CCW 2008) http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/bae-cemlyn--cemlyn-bay-sac.aspx

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	Air Quality • Information provided by the UK Air Pollution Information System (APIS)[34] indicate that the habitats such as coastal lagoons and shingle banks which support designated bird species within Ynys Feurig, Cemlyn Bay and The Skerries SPA are highly sensitive to nitrogen loads, with atmospheric deposition likely to result in increased nutrient loading within these habitats. • Information provided by the Welsh Air Quality Forum[35] indicates that air quality for the Isle of Anglesey is generally good with low levels of ozone, nitrogen dioxide and PM_{10} levels (fine particulate matter) relative to the rest of Wales. • The EA assesses that non-radioactive aerial emissions (sulphur dioxide, nitrogen oxides and volatile organic compounds) from nuclear power stations are extremely low compared with other regulated industries and the Agency does not consider them to be an environmental priority. The Agency's most recent available assessment of radioactive aerial emissions indicates that all fall within authorised limits.[36] • Air quality issues around Nominated site will arise during construction and decommissioning phases, although the extent of this impact remains unknown. Given that air pollution is an identified vulnerability for habitats within this SPA upon which designated birds depend, the potential for significant adverse impacts to occur at Ynys Feurig, Cemlyn Bay and The Skerries SPA therefore cannot be ruled out. **Disturbance (noise, light and visual)** • Information provided by the CCW Core Management Plan for this SPA[37] state that nesting Terns are particularly vulnerable to human disturbance. Levels of human and noise disturbance during all stages of the development will therefore significantly impact upon nesting Tern species.

[34] http://www.apis.ac.uk/
[35] Air Quality in Wales: Website of the Welsh Air Quality Forum http://www.welshairquality.co.uk/trend.php?t=4
[36] Measuring Environmental Performance: Sector Report for the Nuclear Industry (Environment Agency, Nov 2005).
[37] Core Management Plan for Cemlyn Bay and The Skerries SPA (CCW 2008) http://www.ccw.gov.uk/landscape--wildlife/protecting-our-landscape/special-sites-project/aber-to--brecon-sac-list/bae-cemlyn--cemlyn-bay-sac.aspx

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	• It was also noted in the screening that disturbance arising from the construction and decommissioning phases also has the potential to alter foraging, roosting and breeding patterns such that designated bird species could be displaced leading to reduced feeding capacity, thereby indirectly impacting upon breeding and survival rates. • Disturbance during construction and deconstruction stages of the development at Nominated site may also impact upon fish and cetacean species, particularly if construction works take place off-shore. This may result in a depletion of food resources and foraging opportunities and thereby adversely impact upon Tern populations designated within this SPA. • Nominated site lies within 650m of this SPA. Given that the full extent and nature of the development proposals are currently unknown, the extent to which the nature or timing of the development works may affect designated bird species remains undetermined at this stage. The potential for significant adverse impacts to occur upon Ynys Feurig, Cemlyn Bay and The Skerries SPA therefore cannot be ruled out.
Possible Avoidance and Mitigation Measures – *includes recommendations for policy/proposals*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[38] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted. • The use of cooling towers instead of direct intake methods used in cooling water intake should be considered if environmental impacts arising from the use of cooling towers (whereby additional land

[38] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed. **Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze** • Direct loss and fragmentation of habitat (and species) arising from land take from the development of the new nuclear power station together with induced and ancillary infrastructure can be effectively mitigated against by the implementation of a number of key mitigation requirements. These include: – a requirement for the site layout/ design to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for habitat connectivity of wildlife corridors around the site and around induced/ ancillary developments to be maintained and enhanced to reduce the extent of indirect impacts arising from direct land take at these developments;

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	– a requirement for the avoidance of adverse environmental impacts arising from general construction/ operation/ deconstruction activities through the safe operation and decommissioning of the development and of interim waste storage management; – a requirement for adequate ecological mitigation and construction environmental management plans to be produced for the site to minimise further direct and indirect impacts upon habitats and species (such as disturbance, pollution, run-off and drainage etc.), and for such plans to link to existing integrated land and coastal management plans. The interest features and conservation objectives of the designated sites should guide the identification of potential mitigation and compensation measures. – In addition, the reinstatement of a non-working railtrack connecting to the existing power station could reduce the need for additional infrastructure during construction, operation and decommissioning, whilst a proposed 3rd crossing over the Menai strait could further reduce pressures on the existing transport infrastructure. • Avoidance and/or mitigation against any additional losses and fragmentation of habitats and species resulting from the movement of coastal habitat due to changes to the geomorphological processes at the coastal frontage of the site and beyond (as a result of maintenance of/ improvements to existing coastal defences and the construction of additional defences and a marine off-loading facility), is required. Effective mitigation measures include: – a requirement for the layout/ design of additional sea defence measures and marine off-shore landing facilities to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for ecological mitigation and construction environmental management plans to ensure the protection of the coastal fringe and for such plans to link to existing integrated coastal management plans; – a requirement for the consultation of strategic coastal management documents such as the CHaMP, Shoreline Management Plan (and the developing SMP2) and Flood Risk Strategy

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	when determining the location and type of coastal defence required and where such efforts should be concentrated; and – a requirement for other soft engineering techniques such as managed retreat and foreshore recharge to be considered as possible flood defence techniques. • In addition, the construction and generation of physical, chemical and thermal barriers to the migration, commuting and dispersal of fish and bird species will require adequate mitigation to ensure no adverse impacts upon the integrity of European sites. Effective mitigation will require the following to ensure no adverse effects on site integrity is likely: – a requirements for works areas to be screened appropriately with height restrictions implemented where necessary to limit disturbance impacts upon migratory paths; – a requirement for the minimisation of the extent of cooling water culverts and that modern tunnelling and discharge techniques are applied to reduce the impact of thermal plumes; – a requirement for the height of cooling towers (if required) to be kept to a minimum height considered practicable; and – a requirement for the incorporation of fish protection measures within the cooling water intake/system design. **Disturbance** • The implementation of avoidance and mitigation measures aimed to reduce noise, vibration, light and visual disturbance arising from the development of the site and associated induced and ancillary infrastructure during construction, operation and decommissioning is required to ensure no adverse impacts upon the integrity of European sites will occur. Mitigation measures required include: – the requirement for technologies and operating practices which take account identified sensitivities in fish and cetacean (particularly in relation to vibration impacts and low frequency noise) and bird populations (particularly in regard to the regularity of disturbance) in the estuarine environment to be implemented where practicable;

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	– the requirement to restrict encroachment of construction areas into sensitive habitats (particularly coastal) through site design; the requirement to implement appropriate screening of disturbance impacts arising during construction (and deconstruction) works; – the requirement for the phasing and timing of development works which take into account breeding and feeding cycles and habitats, and the flight lines and migration routes of sensitive species including birds, fish and cetaceans; and – the requirement for construction environmental management plans to be implemented at the site level which require the management of disturbance impacts through appropriate avoidance or mitigation to ensure no adverse impacts upon site integrity will arise. There is also a role for the IPC to ensure that developments at Wylfa incorporate technologies and operating practices which take into account identified sensitivities of species in the coastal environment around the proposed development at Wylfa. **Air Quality** • Whilst air quality impacts are not assessed as being a significant vulnerability at Cemlyn Bay SAC it is appropriate that potential air quality impacts arising from developments are addressed as part of the development plan process. Requirements should include the following: – a requirement that sustainable transport plans are available which include the requirement for the use of non-road transport where possible; – a requirement for the phasing of the development to minimise emissions and dust generation; a requirement for the use of carbon-efficient forms of transport and construction during the power station lifecycle; – a requirement for emissions to be off set where appropriate; – a requirement for appropriate air quality management plans to be implemented, with recommendations for mitigation and avoidance to take into account the potential for cumulative impacts where phasing between the existing power station and the new build overlap such that no adverse impacts upon site integrity will occur. – In addition, the reinstatement of a non-working railtrack connecting to the existing power station

	Ynys Feurig, Cemlyn Bay and The Skerries SPA
	could reduce the need for additional infrastructure during construction, operation and decommissioning, whilst a proposed 3rd crossing over the Menai strait could further reduce pressures on the existing transport infrastructure. • The assessment has noted that radioactive emissions from the current nuclear power station around Wylfa are low and are strictly controlled through regulation and the risk assessments undertaken for the consenting process. However additional measures are required to ensure no adverse impacts upon site integrity will occur. These measures include: – a requirement for management measures/ plans relating to emissions to be in place prior to site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments; – a requirement for all recommendations for mitigation and avoidance within management plans to take into account the potential for cumulative impacts where phasing between the existing power station and the new build overlaps; – a requirement to seek opportunities to offsett emissions where appropriate; – a requirement for radioactive emissions to be As Low As Reasonably Achievable (ALARA) [39] with non-radioactive emissions expected to be an improvement upon existing standards; and – the requirement that any emissions which lead to adverse effects on the integrity of European sites will not be permitted by the relevant regulatory authority
Conclude no adverse effect on integrity?	• It is not possible at this stage of the development of the Nuclear NPS to say that proposals at Wylfa will not have significant adverse effects on Cemlyn Bay SPA as a result of impacts to water resources and quality, loss or fragmentation of habitat and species, impacts arising from coastal squeeze, impacts of disturbance, or impacts upon air quality.

[39] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

Site Name:: Lavan Sands/ Traeth Lafan SPA

Location: 53 15 18 N/ 04 02 31 W
SPA EU Code: UK9013031
Size: 2642.98 ha
Designation: SPA

	Lavan Sands/ Traeth Lafan SPA
Qualifying Features	**Over winter the area regularly supports:** Oystercatcher *Haematopus ostralegus*, 4,931 individuals representing at least 0.5% of the wintering Europe and Northern/Western Africa population (5 year peak mean 1991/2 - 1995/6)
Conservation Objectives	**Conservation Objective for Feature 1:** Oystercatcher (*Haematopus ostralegus*) **Vision for feature 1:** The vision for this feature is for it to be in a favourable conservation status, where all of the following conditions are satisfied: • The 5 year mean peak of the number of wintering oystercatchers is at least 4,000. • The abundance and distribution of cockles of 15mm or larger and other suitable food are maintained at levels sufficient to support the population with a 5 year mean peak of 4,000 individuals. • Oystercatchers are not disturbed in ways that prevent them spending enough time feeding for survival. • Roost sites, including high tide roost sites, remain suitable for oystercatchers to roost undisturbed. • The management and control of activities or operations likely to adversely affect the oystercatchers, is appropriate for maintaining the feature in favourable condition and is secure in the long term.

	Lavan Sands/ Traeth Lafan SPA
Key Environmental Conditions (factors that maintain site integrity)	The following factors need to be maintained to ensure no impacts to the integrity of this SPA: • The extent of intertidal flats and the broad-scale spatial distribution of their constituent sediment and community types is maintained • The abundance and distribution of cockles => 15mm are maintained at levels sufficient to support the population at 4,000 individuals. • Disturbance of roosting or feeding oystercatcher is not significant • High tide roost sites do not deteriorate in habitat quality and suitability for birds.
Vulnerabilities (includes existing pressures and trends) ***Details in Appendix 1***	**Disturbance** The main risk to the population of oystercatchers at Traeth Lafan arises from human disturbance associated with the cockle fishery. CCW and other partners are actively working with the North West and North Wales Sea Fisheries Committee to ensure that any cockling is undertaken in a sustainable manner and in a way which does not cause unacceptable disturbance or loss of food resource to oystercatchers and other waders. Disturbance from increased or new types of recreation for example wind kites, small hovercraft etc could potentially threaten the oystercatchers but is mostly confined to the summer months and less likely to occur in the winter when they are roosting on Traeth Lafan. Management of the landward fringe of the site with appropriate birdwatching hides and public access is required given that these areas provide some suitable high tide roosts. However there is open access to the shore and localised disturbance from people and their dogs is difficult (or impossible) to control. Some of the high tide roosts are in fields close to the shore outside the SPA and LNR and it is important that these roosts are not subjected to excessive disturbance, particularly in periods of severe weather when the birds' energy reserves are low. **Food Supply**

	Lavan Sands/ Traeth Lafan SPA
	There have been concerns that the sporadic cockle suction-dredging may deplete oystercatchers' food source.CCW have developed a protocol with the North Wales Sea Fisheries Committee (NWSFC) to allow an assessment of applications for licences to harvest cockles. NWSFC will now only invite applications for licences if cockle stocks are considered to be relatively high. CCW is commissioning research to quantifycockle stocks in relation to their depletion by foraging oystercatchers. **Habitat Degredaton** High tide roosting sites are characterised by having good sightlines (i.e. open spaces where the birds can see any potential predators). Any significant increase in grass height through cessation of grazing, in hedge height or changes by means of tree planting or installation of tall structures could impact on the roosts and consequently the oystercatcher population. This should be considered in assessing any plans or projects close to the shore.
Predicted Impacts ***What are the issues arising from the plan and how might the site be affected?***	**Water Resources and Quality** • Increased/ altered drainage from earthworks and excavation • Potential for toxic contamination from accidental leakage • Radioactive discharges (accidental and routine) • Alteration of flow from abstraction • Changes to water temperature from controlled discharge • Sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases **Habitat (and Species) Loss and Fragmentation** • Direct loss of coastal lagoon and stony bank habitats for which the SAC is designated for through general construction and deconstruction activities and where encroachment upon the coastal fringe is necessary • Fragmentation from encroachment onto surrounding habitats during construction of the nuclear

	Lavan Sands/ Traeth Lafan SPA
	power station and related infrastructure required during the construction and decommissioning phases • Loss of habitat arising from encroachment of the development into the coastal fringe resulting in erosion or accretion of designated habitats **Coastal Squeeze** • Reduction of the coastal margin through encroachment of the development footprint onto the coastal fringe leading to alterations in sediment transport regimes which can impact upon coast morphology. **Disturbance (noise, light and visual)** • Local level impacts arising from construction and decommissioning activities can impact upon over wintering and breeding birds for which the site is designated
Potential In-combination effects (screening) ***What other plans and programmes could lead to in-combinations effects?***	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those identified issues (for example Catchment Abstraction Management Strategies). **Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa

	Lavan Sands/ Traeth Lafan SPA
	Habitat (and Species) Loss and Fragmentation • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynsys Enli to Llandudno Shoreline Management Plan **Coastal Squeeze** • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynsys Enli to Llandudno Shoreline Management Plan **Disturbance** • The CCW 2002 Review of SPAs • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993)

	Lavan Sands/ Traeth Lafan SPA
	• Unitary Development Plan (unadopted 2005) • Wales Transport Strategy Plan (2008) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa
Appropriate Assessment **Likelihood of adverse effect on integrity:**	**Water Resource and Quality** • Direct impacts upon water resources and quality at Lavan Sands SPA arising from the development at Wylfa are not considered likely given its distance from Wylfa (31km away) However indirect impacts may arise which may adversely affect the integrity of this European site. The discharge of synthetic and non-synthetic toxic compounds and transfer of additional sediment loading arising from the nomination site to habitats and species within this SPA may occur given that wave-induced sediment and littoral transport is eastwards along the north Wales Coast[40] and that Liverpool Bay (within which this SPA occurs) is a known net sink for sediment[41]. • Overwintering populations of oystercatcher designated within Lavan Sands SPA show preferences for relatively shallow waters and sandy bays where they feed actively over winter. Food resources such as sand eels, cockles, crustaceans, invertebrates, sprat and herring are concentrated in these shallower coastal waters and habitats and are the preferred prey items of these bird species. Any alterations to water quality such as through increases in nutrient and sediment loading at these habitats may alter the quality, abundance and distribution of these prey, whilst the deposition and accumulation of toxic, non-synthetic compounds within these mudflat, sand flat, and salt marsh habitats may be transferred to prey and predators through the food chain. In particular, oystercatchers favour bivalves such as cockles as part of their diet. However bivalves are known to be particularly efficient bioaccummulators due to their filtering physiology, such that the uptake of toxins and potential transfer to bird species which feed upon them may result in adverse effects upon

[40] North West England and North Wales Shoreline Management Plan: Appendix C: Baseline Process Understanding http://mycoastline.org/documents/overview1.pdf
[41] North West and North Wales Coastal Group (2008) Cell 11 Shoreline Management Plan SMP2: North West England and North Wales. Draft Baseline Process Understanding: Report C1 Introduction and Approach. http://mycoastline.org/documents/Intro1.pdf

	Lavan Sands/ Traeth Lafan SPA
	the integrity of these European sites. **Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze** • Direct impacts upon habitats and species at Lavan Sands SPA arising from direct land take as a result of the development at the nomination site are not likely given its distance away (30km away). Indirect impacts which may result in adverse effects upon site integrity however may arise. The bioaccumulation of synthetic and non-synthetic toxic compounds within habitats and prey items may be transferred up through the food chain to designated bird species within Lavan Sands SPA (overwintering populations of oystercatcher), impacting upon the growth rate, health and size of their populations[42]. However distances over which sediment-bound toxins are transferred are unknown. Moreover the loss and/or fragmentation of buffering habitats such as those within Menai Strait and Conwy Bay SAC may further impact upon the abundance and distribution of designated bird species given that their boundaries overlap. Adverse impacts upon the integrity of these sites must therefore be assumed at this strategic stage. **Disturbance (noise, light and visual)** • Given the distance of this European site from the nomination site at Wylfa, impacts of disturbance arising from the development of the nuclear power station upon designated bird species within this European site is not considered to result in adverse impacts upon their integrity.
Possible Avoidance and Mitigation Measures – *includes recommendations for*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and

[42] Murata M., Iseki N., Masunaga S. & Nakanishi J. (2003) Estimation of effects of dioxins and dioxin-like PCBs on wildlife population: a case study on common cormorant. Chemosphere, 53(4): 337-345

	Lavan Sands/ Traeth Lafan SPA
policy/proposals	discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[43] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted. • The use of cooling towers instead of direct intake methods used in cooling water intake should be considered if environmental impacts arising from the use of cooling towers (whereby additional land take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed.

[43] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

	Lavan Sands/ Traeth Lafan SPA
	Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze • Direct loss and fragmentation of habitat (and species) arising from land take from the development of the new nuclear power station together with induced and ancillary infrastructure can be effectively mitigated against by the implementation of a number of key mitigation requirements. These include: – a requirement for the site layout/ design to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for habitat connectivity of wildlife corridors around the site and around induced/ ancillary developments to be maintained and enhanced to reduce the extent of indirect impacts arising from direct land take at these developments; – a requirement for the avoidance of adverse environmental impacts arising from general construction/ operation/ deconstruction activities through the safe operation and decommissioning of the development and of interim waste storage management; – a requirement for adequate ecological mitigation and construction environmental management plans to be produced for the site to minimise further direct and indirect impacts upon habitats and species (such as disturbance, pollution, run-off and drainage etc.), and for such plans to link to existing integrated land and coastal management plans. The interest features and conservation objectives of the designated sites should guide the identification of potential mitigation and compensation measures. – In addition, the reinstatement of a non-working railtrack connecting to the existing power station could reduce the need for additional infrastructure during construction, operation and decommissioning, whilst a proposed 3rd crossing over the Menai strait could further reduce pressures on the existing transport infrastructure. • Avoidance and/or mitigation against any additional losses and fragmentation of habitats and species resulting from the movement of coastal habitat due to changes to the geomorphological processes at the coastal frontage of the site and beyond (as a result of maintenance of/ improvements to existing coastal defences and the construction of additional defences and a marine off-loading facility), is

	Lavan Sands/ Traeth Lafan SPA
	required. Effective mitigation measures include: – a requirement for the layout/ design of additional sea defence measures and marine off-shore landing facilities to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for ecological mitigation and construction environmental management plans to ensure the protection of the coastal fringe and for such plans to link to existing integrated coastal management plans; – a requirement for the consultation of strategic coastal management documents such as the CHaMP, Shoreline Management Plan (and the developing SMP2) and Flood Risk Strategy when determining the location and type of coastal defence required and where such efforts should be concentrated; and – a requirement for other soft engineering techniques such as managed retreat and foreshore recharge to be considered as possible flood defence techniques. • In addition, the construction and generation of physical, chemical and thermal barriers to the migration, commuting and dispersal of fish and bird species will require adequate mitigation to ensure no adverse impacts upon the integrity of European sites. Effective mitigation will require the following to ensure no adverse effects on site integrity is likely: – a requirements for works areas to be screened appropriately with height restrictions implemented where necessary to limit disturbance impacts upon migratory paths; – a requirement for the minimisation of the extent of cooling water culverts and that modern tunnelling and discharge techniques are applied to reduce the impact of thermal plumes; – a requirement for the height of cooling towers (if required) to be kept to a minimum height considered practicable; and – a requirement for the incorporation of fish protection measures within the cooling water intake/system design.

	Lavan Sands/ Traeth Lafan SPA
Conclude no adverse effect on integrity?	• It is not possible at this stage of the development of the Nuclear NPS to say that the development of a nuclear power station at Wylfa will not have adverse effects upon the integrity of Lavan Sands SPA as a result of impacts to water resources and quality, habitat (and species) loss and fragmentation, or coastal squeeze. • No adverse effects upon the integrity of this European site arising from impacts of disturbance are considered likely.

Site Name: Puffin Island /Ynys Seiriol SPA

- **Location: 53 31 69 N/ 04 02 54 W**
- **SPA EU Code: UK9020285**
- **Size: 31.6 ha**
- **Designation: SPA**

	Puffin Island /Ynys Seiriol SPA
Qualifying Features	This site qualifies under **Article 4.2** of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species: **During the breeding season;** Cormorant *Phalacrocorax carbo*, 776 pairs representing at least 1.9% of the breeding Northwestern Europe population (count as at 1996)
Conservation Objectives	**Conservation Objective for Feature 1:** Breeding population of cormorant *Phalacrocorax carbo* The conservation objective for the Cormorant is to achieve and maintain favourable conservation status, in which all the following conditions are satisfied: • The number of breeding cormorants within the SPA are stable or increasing. • The abundance and distribution of prey species are sufficient to support this number of breeding pairs and for successful breeding. • The management and control of activities or operations likely to adversely affect the Cormorants, is appropriate for maintaining the feature in favourable condition and is secure in the long term."
Key Environmental Conditions (factors	• Provision of nest sites through the management and maintenance of habitats such as sea cliffs, maritime grassland and intertidal rocks

	Puffin Island /Ynys Seiriol SPA
that maintain site integrity)	• Predator control (rats, cats and avian predators) • Managing recreation (fishing, walking, climbing, canoeing, cycling access) to prevent disturbance
Vulnerabilities (includes existing pressures and trends) ***Details in Appendix 1***	**Disturbance** Breeding seabirds require secure nesting sites, free from human disturbance. Visits to the island should be controlled during the nesting season (February to July inclusive) and any visits necessary should seek to avoid disturbance to sensitive areas, particularly nesting cliffs. No dogs (except guide-dogs) or cats should be permitted at any time. **Fishing** Non-sustainable exploitation of fishing stocks within the cormorants' feeding range during the breeding season can have a negative effect on breeding success and adequate recruitment of fledglings. Presence of fishing nets, especially fixed nets, close to the colony carries risk to foraging birds. **Predation** Breeding seabirds require freedom from ground predators to thrive. Small offshore islands should be naturally ground predator-free. Rats, cats or other ground predators can decimate breeding colonies. Although cormorants appear to have thrived alongside brown rats until their eradication in 1998, other seabirds appear to have been confined to marginal habitat. Every effort should be made to avoid introduction and to eradicate any ground predators present. Avian predators such as peregrine or greater black-backed gulls should be tolerated. **Invasive Species** The expansion of the elderwood may be inimical to further expansion of the seabird numbers. Consideration is being given to the reintroduction of grazing animals to control the vegetation.

	Puffin Island /Ynys Seiriol SPA
Predicted Impacts ***What are the issues arising from the plan and how might the site be affected?***	**Water Resources and Quality** • Increased/ altered drainage from earthworks and excavation • Potential for toxic contamination from accidental leakage • Radioactive discharges (accidental and routine) • Alteration of flow from abstraction • Changes to water temperature from controlled discharge • Sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases **Habitat (and Species) Loss and Fragmentation** • Direct loss of coastal lagoon and stony bank habitats for which the SAC is designated for through general construction and deconstruction activities and where encroachment upon the coastal fringe is necessary • Fragmentation from encroachment onto surrounding habitats during construction of the nuclear power station and related infrastructure required during the construction and decommissioning phases • Loss of habitat arising from encroachment of the development into the coastal fringe resulting in erosion or accretion of designated habitats **Coastal Squeeze** • Reduction of the coastal margin through encroachment of the development footprint onto the coastal fringe leading to alterations in sediment transport regimes which can impact upon coast morphology. **Disturbance (noise, light and visual)** • Local level impacts arising from construction and decommissioning activities can impact upon over wintering and breeding birds for which the site is designated

	Puffin Island /Ynys Seiriol SPA
Potential In-combination effects (screening) ***What other plans and programmes could lead to in-combinations effects?***	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those identified issues (for example Catchment Abstraction Management Strategies). **Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa **Habitat (and Species) Loss and Fragmentation** • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynys Enli to Llandudno Shoreline Management Plan **Coastal Squeeze** • The CCW 2002 Review of SPAs

	Puffin Island /Ynys Seiriol SPA
	• Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynys Enli to Llandudno Shoreline Management Plan **Disturbance** • The CCW 2002 Review of SPAs • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Wales Transport Strategy Plan (2008) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wylfa
Appropriate Assessment **Likelihood of adverse effect on integrity:**	**Water Resource and Quality** • Breeding populations of cormorant designated within Puffin Island SPA rarely forage in deeper waters, preferring to forage within shallower waters off the coast[44] where prey items including bottom-dwelling fish, cruscaceans and molluscs are abundant. Wave-induced sediment and littoral transport is eastwards along the north Wales Coast[45], whilst Liverpool Bay (within which this SPA occur) is a

[44] Snow D. W. & Perrins C. M. (eds) (1998) The Birds of the Western Palearctic. Concise edition. *Oxford Univ. Press, Oxford.*

[45] North West England and North Wales Shoreline Management Plan: Appendix C: Baseline Process Understanding http://mycoastline.org/documents/overview1.pdf

	Puffin Island /Ynys Seiriol SPA
	known net sink for sediment[46]. Impacts upon designated bird species may therefore arise as a result of alterations to water quality arising from the deposition of sediment-bound toxins at Puffin Island SPA, and the accumulation of such toxins within prey items upon which birds feed. Any uptake of toxins through the food chain to designated bird species may therefore result in adverse effects upon the integrity of this European site. **Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze** • Direct impacts upon habitats and species at Puffin Island SPA arising from direct land take as a result of the development at the nomination site are not likely given its distance away (40km away). Indirect impacts which may result in adverse effects upon site integrity however may arise. The bioaccumulation of synthetic and non-synthetic toxic compounds within habitats and prey items may be transferred up through the food chain to designated bird species within Puffin Island SPA (breeding populations of cormorant), impacting upon the growth rate, health and size of their populations[47]. However distances over which sediment-bound toxins are transferred are unknown. Moreover the loss and/or fragmentation of buffering habitats such as those within Menai Strait and Conwy Bay SAC may further impact upon the abundance and distribution of designated bird species given that their boundaries overlap. Adverse impacts upon the integrity of these sites must therefore be assumed at this strategic stage. **Disturbance (noise, light and visual)** • Given the distance of this European site from the nomination site at Wylfa, impacts of disturbance arising from the development of the nuclear power station upon designated bird species within this European site is not considered to result in adverse impacts upon their integrity.

[46] North West and North Wales Coastal Group (2008) Cell 11 Shoreline Management Plan SMP2: North West England and North Wales. Draft Baseline Process Understanding: Report C1 Introduction and Approach. http://mycoastline.org/documents/Intro1.pdf
[47] Murata M., Iseki N., Masunaga S. & Nakanishi J. (2003) Estimation of effects of dioxins and dioxin-like PCBs on wildlife population: a case study on common cormorant. Chemosphere, 53(4): 337-345

	Puffin Island /Ynys Seiriol SPA
Possible Avoidance and Mitigation Measures – *includes recommendations for policy/proposals*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[48] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted. • The use of cooling towers instead of direct intake methods used in cooling water intake should be considered if environmental impacts arising from the use of cooling towers (whereby additional land take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures.

[48] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

	Puffin Island /Ynys Seiriol SPA
	Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed. **Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze** • Direct loss and fragmentation of habitat (and species) arising from land take from the development of the new nuclear power station together with induced and ancillary infrastructure can be effectively mitigated against by the implementation of a number of key mitigation requirements. These include: – a requirement for the site layout/ design to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for habitat connectivity of wildlife corridors around the site and around induced/ ancillary developments to be maintained and enhanced to reduce the extent of indirect impacts arising from direct land take at these developments; – a requirement for the avoidance of adverse environmental impacts arising from general construction/ operation/ deconstruction activities through the safe operation and decommissioning of the development and of interim waste storage management; – a requirement for adequate ecological mitigation and construction environmental management plans to be produced for the site to minimise further direct and indirect impacts upon habitats and species (such as disturbance, pollution, run-off and drainage etc.), and for such plans to link to existing integrated land and coastal management plans. The interest features and conservation objectives of the designated sites should guide the identification of potential mitigation and compensation measures. – In addition, the reinstatement of a non-working railtrack connecting to the existing power station could reduce the need for additional infrastructure during construction, operation and decommissioning, whilst a proposed 3rd crossing over the Menai strait could further reduce pressures on the existing transport infrastructure. • Avoidance and/or mitigation against any additional losses and fragmentation of habitats and species

	Puffin Island /Ynys Seiriol SPA
	resulting from the movement of coastal habitat due to changes to the geomorphological processes at the coastal frontage of the site and beyond (as a result of maintenance of/ improvements to existing coastal defences and the construction of additional defences and a marine off-loading facility), is required. Effective mitigation measures include: – a requirement for the layout/ design of additional sea defence measures and marine off-shore landing facilities to avoid areas of known importance or sensitivities and to protect existing habitats which are to be retained; – a requirement for ecological mitigation and construction environmental management plans to ensure the protection of the coastal fringe and for such plans to link to existing integrated coastal management plans; – a requirement for the consultation of strategic coastal management documents such as the CHaMP, Shoreline Management Plan (and the developing SMP2) and Flood Risk Strategy when determining the location and type of coastal defence required and where such efforts should be concentrated; and – a requirement for other soft engineering techniques such as managed retreat and foreshore recharge to be considered as possible flood defence techniques. • In addition, the construction and generation of physical, chemical and thermal barriers to the migration, commuting and dispersal of fish and bird species will require adequate mitigation to ensure no adverse impacts upon the integrity of European sites. Effective mitigation will require the following to ensure no adverse effects on site integrity is likely: – a requirements for works areas to be screened appropriately with height restrictions implemented where necessary to limit disturbance impacts upon migratory paths; – a requirement for the minimisation of the extent of cooling water culverts and that modern tunnelling and discharge techniques are applied to reduce the impact of thermal plumes; – a requirement for the height of cooling towers (if required) to be kept to a minimum height considered practicable; and

	Puffin Island /Ynys Seiriol SPA
	– a requirement for the incorporation of fish protection measures within the cooling water intake/system design.
Conclude no adverse effect on integrity?	• It is not possible at this stage of the development of the Nuclear NPS to say that the development of a nuclear power station at Wylfa will not have adverse effects upon the integrity of Puffin Island SPA as a result of impacts to water resources and quality, habitat (and species) loss and fragmentation, or coastal squeeze. • No adverse effects upon the integrity of this European site arising from impacts of disturbance are considered likely.

Site Name: Liverpool Bay SPA

- **Location: 53 21 24 N/ 03 42 25 W**
- **SPA EU Code N/A**
- **Size: 197,594.24 ha**
- **Designation: SPA**

	Liverpool Bay SPA
Qualifying Features	28.7% of the GB population of Red-throated diver (*Gavia stellata*) Annex I species 3.3% of the migratory population of Common scoter (*Melanitta nigra*) Annex 2.2 Species
• **Conservation Objectives**	Whilst Natural England/CCW English Nature has not supplied a draft designation document for the SPA, the conservation objectives supplied for the Mersey Estuary lists the attributes and features required to be maintained so as to maintain favorable conditions for the qualifying species.
Key Environmental Conditions (factors that maintain site integrity)	**Feeding grounds for the qualifying species require the following:** • 20m-depth contour • Exposure to weak tidal currents • accumulations of mud and sand belts. • Limited potentially disturbing activities such as noise or lighting
Vulnerabilities (includes existing pressures and trends) ***Details in Appendix 1***	Existing pressures and trends include commercial interests in Liverpool Bay, particularly off the Wirral coast. The SPA is bisected by the channel to the Port of Liverpool and also contains a number of windfarms and oil and gas platforms. Categories of operations, which may cause deterioration or disturbance, includes • coast protection and sea defences,

	Liverpool Bay SPA
	• power generation, • sediment extraction, • transport and communication • noise or visual disturbance such as lighting
Predicted Impacts ***What are the issues arising from the plan and how might the site be affected?***	**Water Resources and Quality** • Increased/ altered drainage from earthworks and excavation • Potential for toxic contamination from accidental leakage • Radioactive discharges (accidental and routine) • Alteration of flow from abstraction • Changes to water temperature from controlled discharge • Sedimentation and changes in organic and nutrient loading arising from construction during the construction and decommissioning phases **Habitat (and Species) Loss and Fragmentation** • Direct loss of coastal lagoon and stony bank habitats for which the SAC is designated for through general construction and deconstruction activities and where encroachment upon the coastal fringe is necessary • Fragmentation from encroachment onto surrounding habitats during construction of the nuclear power station and related infrastructure required during the construction and decommissioning phases • Loss of habitat arising from encroachment of the development into the coastal fringe resulting in erosion or accretion of designated habitats **Coastal Squeeze** • Reduction of the coastal margin through encroachment of the development footprint onto the coastal fringe leading to alterations in sediment transport regimes which can impact upon coast morphology.

	Liverpool Bay SPA
	Disturbance (noise, light and visual) Local level impacts arising from construction and decommissioning activities can impact upon over wintering and breeding birds for which the site is designated
Potential In-combination effects (screening) ***What other plans and programmes could lead to in-combinations effects?***	The following plans have the potential to contribute 'in-combination' impacts in relation to the key issues identified. In-combination impacts may be positive where the plans' function is to actively manage those identified issues (for example Catchment Abstraction Management Strategies). **Water Resources and Quality** • The Environment Agency's Review of Consents (2010) • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa **Habitat (and Species) Loss and Fragmentation** • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005)

	Liverpool Bay SPA
	• Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wylfa • Ynys Enli to Llandudno Shoreline Management Plan **Coastal Squeeze** • The CCW 2002 Review of SPAs • Dwr Cymru Welsh Water draft Water Resources Management Plan • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa • Ynys Enli to Llandudno Shoreline Management Plan **Disturbance** • The CCW 2002 Review of SPAs • The Wales Spatial Plan (Updated 2008) • Ynys Môn (Anglesey) Local Plan (1996) • Gwynedd Structure Plan (1993) • Unitary Development Plan (unadopted 2005) • Wales Transport Strategy Plan (2008) • Welsh Coastal Tourism Strategy (2007) • Decommissioning of the existing nuclear power station at Wlyfa
Appropriate Assessment	**Water Resource and Quality** • Direct impacts upon water resources and quality at Liverpool Bay SPA arising from the development

	Liverpool Bay SPA
Likelihood of adverse effect on integrity:	at Wylfa are not considered likely given its distance from Wylfa (17km away) However indirect impacts may arise which may adversely affect the integrity of this European site. The discharge of synthetic and non-synthetic toxic compounds and transfer of additional sediment loading arising from the nomination site to habitats and species within this SPA may occur given that wave-induced sediment and littoral transport is eastwards along the north Wales Coast[49] and that Liverpool Bay (within which this SPA occurs) is a known net sink for sediment[50]. • Overwintering populations of red-throated diver and black scoter show preferences for relatively shallow waters and sandy bays where they feed actively over winter, with most individuals thought to roost close to their daytime feeding areas[51]. Food resources such as sand eels, molluscs, crustaceans, invertebrates, sprat and herring are concentrated in these shallower coastal waters and habitats and are the preferred prey items of these bird species. Any alterations to water quality such as through increases in nutrient and sediment loading at these habitats may alter the quality, abundance and distribution of these prey, whilst the deposition and accumulation of toxic, non-synthetic compounds within these mudflat, sand flat, and salt marsh habitats may be transferred to prey and predators through the food chain. In particular, common scoter favours bivalves such as blue mussels as part of their diet, with studies showing the abundance and biomass of bivalve prey species to be strong predictors of common scoter numbers within Liverpool Bay[52]. However bivalves are known to be particularly efficient bioaccummulators due to their filtering physiology, such that the uptake of toxins and potential transfer to bird species which feed upon them may result in adverse effects upon the integrity of these European sites.

[49] North West England and North Wales Shoreline Management Plan: Appendix C: Baseline Process Understanding http://mycoastline.org/documents/overview1.pdf
[50] North West and North Wales Coastal Group (2008) Cell 11 Shoreline Management Plan SMP2: North West England and North Wales. Draft Baseline Process Understanding: Report C1 Introduction and Approach. http://mycoastline.org/documents/Intro1.pdf
[51] Cork Ecology *2004) Review of divers, grebes and seaduck distribution and abundance in the SEA 5 area. http://www.offshore sea.org.uk/consultations/SEA_5/SEA5_TR_Seabirds_CorkEcology.pdf
[52] Kaiser M.J. (2002) Predicting the displacement of common scoter from benthic feeding areas due to offshore windfarms. http://www.offshorewindfarms.co.uk/Assets/ScoterExecutiveSummary.pdf

	Liverpool Bay SPA
	Habitat (and Species) Loss and Fragmentation/ Coastal Squeeze • Direct impacts upon habitats and species at Liverpool Bay SPA arising from direct land take as a result of the development at Wylfa are not considered likely given its distance away (the westernmost extent of Liverpool Bay SPA is located greater than 15km from Wylfa). However indirect impacts may arise which may adversely affect the integrity of this European site. The loss and/or fragmentation of buffering habitats such as those within Menai Strait and Conwy Bay SAC may impact upon the abundance and distribution of overwintering populations of designated bird species. Also, as discussed previously, the accumulation of synthetic and non-synthetic toxic compounds within habitats upon which designated bird species within Liverpool Bay SPA (common scoter and red-throated diver) depend for their food supply may also adversely impact these resources. Toxic compounds may be transferred from these habitats to fish, crustaceans, bivalves and invertebrates where they can result in endocrine disruption following synergistic impacts between toxic compounds, leading to altered rates of reproduction and dispersal. Such alterations of food availability will affect the abundance and distribution of designated bird species within this SPA, with studies showing the abundance and biomass of bivalve prey species in particular being strong predictors of common scoter numbers within Liverpool Bay[53]. However the extensive area over which red-throated diver and common scoter occur within Liverpool Bay SPA itself (boundaries of this SPA include all of the coastline between Dulas Bay, east coast of Anglesey, to Fleetwood, north of Blackpool) [54] suggest that adverse impacts upon the integrity of this site are unlikely. **Disturbance (noise, light and visual)** • Studies suggest that over-wintering populations of common scoter within Liverpool Bay SPA are

[53] Kaiser M.J. (2002) Predicting the displacement of common scoter from benthic feeding areas due to offshore windfarms. http://www.offshorewindfarms.co.uk/Assets/ScoterExecutiveSummary.pdf
[54] Webb, A., McSorley, C.A., Dean, B.J., Reid, J.B., (2006), Recommendations for the selection of and boundary options for an SPA in Liverpool Bay, JNCC Report 388 http://www.jncc.gov.uk/pdf/jncc388.pdf

	Liverpool Bay SPA
	sensitive to disturbance impacts arising from moving vessels within 1 - 2km from the flock, with smaller flocks being less sensitive to disturbance[55]. Given that the westernmost extent of Liverpool Bay SPA is located greater than 15km from Wylfa, and that the area of Liverpool Bay SPA is extensive, covering all of the coastline between Dulas Bay, east coast of Anglesey, to Fleetwood, north of Blackpool, noise, light and visual disturbance impacts arising from the development at Wylfa are therefore not anticipated to result in adverse effects upon the integrity of this European site.
Possible Avoidance and Mitigation Measures – *includes recommendations for policy/proposals*	**Water Resource and Quality** • Avoiding adverse effects upon surface, ground and estuarine waters is the responsibility of the developer, but is subject to a stringent management and regulatory frameworks by the Water Companies (resource planning) and the Environment Agency (EA) (abstraction licensing and discharge consents, to be reviewed under the Review of Consents process to be completed by 2010). Thermal, radioactive and non-radioactive discharges should go beyond complying with existing standards, with radioactive discharges required to be As Low As Reasonably Achievable (ALARA)[56] and that all other discharge levels are required to be an improvement on existing standards. All discharges which lead to adverse effects on the integrity of European sites should not be permitted. • The use of cooling towers instead of direct intake methods used in cooling water intake should be considered if environmental impacts arising from the use of cooling towers (whereby additional land take is necessary and visual impacts are likely) can be more effectively avoided or mitigated than for those impacts arising from the use of direct intake methods (where there are much greater abstraction requirements, a need for large culverts which extend a long way out into the water source, and result in higher thermal discharges). Should this not be the case, cooling water culverts should be designed to avoid effects on the existing thermal regime at Wylfa. Furthermore the volume

[55] Kaiser M.J. (2002) Predicting the displacement of common scoter from benthic feeding areas due to offshore windfarms. http://www.offshorewindfarms.co.uk/Assets/ScoterExecutiveSummary.pdf

[56] ALARA is not a dose limit; it is a practice that has as its objective the attainment of dose levels as far below applicable limits as possible.

	Liverpool Bay SPA
	of cooling water returned to the estuary should be required to be within the capacity of the immediate receiving environment such that sediment flow is not adversely affected. • The IPC, as guided by the NPS, can also direct requirements for the efficiency of water use and the protection of water quality. This may include requiring that management measures relating to supply and discharge (including potential effects on European sites), are in place prior site development, with decisions made taking into account Best Available Technology (BAT) which ensure protection of the sensitivities of the receiving environments. • The majority of remaining adverse effects upon water quality and resources will be effectively mitigated for through the implementation of suitable design (including use of Sustainable Urban Drainage Systems (SuDS)) and through the required selection of appropriate construction measures. Impacts upon groundwater flow should also be effectively avoided or mitigated by requiring that suitable design in abstraction mechanisms is employed.
Conclude no adverse effect on integrity?	• It is not possible at this stage of the development of the Nuclear NPS to say that the development of a nuclear power station at Wylfa will not have adverse effects upon the integrity of Liverpool Bay SPA as a result of impacts to water resources and quality, habitat (and species) loss and fragmentation, or coastal squeeze. • No adverse effects upon the integrity of this European site arising from impacts of habitat loss (and species) and fragmentation or disturbance are considered likely.

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