

HALTON CORE STRATEGY PROPOSED SUBMISSION DOCUMENT

Habitats Regulations Assessment
Appropriate Assessment

OCTOBER 2010

Please acknowledge that this document is currently a working draft and includes inconsistencies in relation to the draft Proposed Submission Document.

This document will be subject to change.

HALTON LOCAL DEVELOPMENT FRAMEWORK
It's all happening IN HALTON
A Spatial Strategy for Halton 2026

Revision Schedule

HRA/AA Report October 2010

Rev	Date	Details	Prepared by	Reviewed by	Approved by
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1 Introduction

- 1.1 The Habitats Directive applies the precautionary principle to Natura 2000 sites (Special Areas of Conservation, SACs, and Special Protection Areas, SPAs; as a matter of UK Government policy, Ramsar sites¹ are given equivalent status). The need for AA is set out within Article 6 of the EC Habitats Directive 1992, and interpreted into British law by the Conservation of Habitats and Species Regulations 2010 (**Box 1**). The ultimate aim of the Directive is to “*maintain or restore, at favourable conservation status, natural habitats and species of wild fauna and flora of Community interest*” (Habitats Directive, Article 2(2)). This aim relates to habitats and species, not the European sites themselves, although the sites have a significant role in delivering favourable conservation status.

Box 1. The legislative basis for Appropriate Assessment

Habitats Directive 1992

“Any plan or project not directly connected with or necessary to the management of the site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subject to appropriate assessment of its implications for the site in view of the site’s conservation objectives.”

Article 6 (3)

Conservation of Habitats and Species Regulations 2010

“A competent authority, before deciding to ... give any consent for a plan or project which is likely to have a significant effect on a European site ... shall make an appropriate assessment of the implications for the site in view of that sites conservation objectives ... The authority shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the European site”.

- 1.2 Scott Wilson has been appointed by Halton Borough Council (“the Council”) to assist in undertaking a Habitat Regulations Assessment (HRA) of the potential effects of the Local Development Framework Core Strategy, on the Natura 2000 network and Ramsar sites.
- 1.3 The LDF will supersede the current Unitary Development Plan. The current Unitary Development Plan was adopted in 2005 and is saved until the LDF Development Plan Documents (DPDs) come into effect. The Council’s aim is to adopt an LDF Core Strategy from 2010.
- 1.4 This document reports on the HRA Screening of the Draft Publication Core Strategy. Earlier HRA work associated with the Issues and Options draft of the Core Strategy is reported elsewhere (Scott Wilson, June 2009).
- 1.5 Chapter 2 of this report explains the process by which the screening element of the HRA has been carried out. Chapter 3 explores the relevant pathways of impact resulting from the scale of

¹ Wetlands of International Importance designated under the Ramsar Convention 1979

development that will be delivered in Halton. Chapters 4 to 15 provide a screening exercise for the Core Strategy as a whole organised on the basis of one chapter per European site, except where multiple sites overlap in a particular geographic area (e.g. Ribble & Alt Estuaries SPA and Ramsar sites). Each chapter begins with a consideration of the interest features and ecological condition of the site and environmental process essential to maintain site integrity. A brief assessment of the Core Strategy in respect of each European site (both in isolation and in combination with other projects and plans) is then carried out. The conclusion of the screening exercise is then summarised in Chapter 16.

Halton Core Strategy

- 1.6 The purpose of the Core Strategy is to contribute to the delivery of sustainable development within Halton. This is to be achieved through setting out the vision, objectives and strategic approach for the spatial development of the Borough until 2026. The Core Strategy will therefore provide the over-arching policy framework for the Halton LDF (Local Development Framework).
- 1.7 The draft publication Core Strategy, subject to this HRA screening, sets out the vision, objective and strategy for development in the Borough. Whilst some broad particular locational sites for development are identified, the allocation of individual sites will be implemented through the Allocation and Policy DPDs.
- 1.8 The key aspects of the Core Strategy that are subject to HRA screening in this report relate to:
- the provision of 8,000 housing units (2003-2026) at rate of 600 units per annum (2008-2017) and 500 units per annum (2017-2026) (Policy CS2);
 - the provision of 289 hectares of new employment land (2010-2026) (Policy CS3);
 - provision of infrastructure (CS5) including transport infrastructure (roads, railways, public transport, walking and cycle routes) (also CS6; CS14, CS15); physical/environmental infrastructure e.g. water supply/treatment energy supply; green infrastructure (green spaces) (also CS210); and social infrastructure (community services/facilities);
 - 3MG (Mersey Multimodal Gateway) facilitating freight by rail and a new link road joining the site with Knowsley Expressway (CS6);
 - South Widnes town centre and waterfront revitalisation (CS7) (CS4);
 - East Runcorn mixed use/new housing/science park/business park development (CS8);
 - Runcorn old town centre to be developed as a vibrant waterside location (shopping, leisure) and Runcorn docklands to accommodate major residential /mixed use development on existing waterside employment sites (CS9, CS4);
 - Mersey Gateway Port (Western Docks within Runcorn) to be developed as a multimodal facility encouraging greater use of Manchester ship canal for freight, and making use of rail/road infrastructure (CS9);

- Mersey Gateway Bridge construction to improve cross-river sustainable transport opportunities (CS15);
- Liverpool John Lennon Airport expansion (CS16);
- meeting the needs of Gypsies, Travellers and Travelling Show People (CS12);
- renewable energy and low carbon energy (including wind turbines and CHP) (CS18);
- remediation of contaminated land (CS24);
- sustainable waste management (CS 25), and
- minerals management (CS26).

1.9 It is important to note that the population of Halton is not actually expected to increase over the Core Strategy period despite the delivery of new housing (it may either stabilise or continue its current declining trend), but the relative demographic distribution is likely to change leading to a shift from a younger population to an older population and a greater number of smaller households. In addition, part of the intent of the Core Strategy is to stimulate growth and investment in the Borough which may over the Core Strategy period reverse the declining trend.

1.10 It should be noted that the proposed expansion of the Port of Liverpool onto Seaforth Nature Reserve, while referenced in the Core Strategy is not ultimately in the control of Halton Council but will be decided through the Harbour Revision Order process. For this reason we have treated the port expansion as a 'plan or project' to be considered 'in combination' with the Core Strategy throughout this report.

2 Methodology

Introduction

- 2.1 This section sets out our approach and methodology for undertaking the HRA. Although this report relates only to the HRA Screening stage, the full HRA process is described briefly below in order to provide context and clarity to the current assessment. Habitat Regulations Assessment itself operates independently from the Planning Policy system, being a legal requirement of a discrete Statutory Instrument. Therefore there is no direct relationship to PPS12 and the 'Test of Soundness'. The HRA process that we have adopted has been designed to ensure that the HRA is: a) compliant, b) accepted by key stakeholders including Natural England c) has clear recommendations that can be used by the Council to develop their plan; and d) has a clear record of the process undertaken, providing the necessary evidence base for the plan.

A Proportionate Assessment

- 2.2 Project-related HRA often requires bespoke survey work and novel data generation in order to accurately determine the significance of adverse effects, that is, to look beyond the risk of an effect to a justified prediction of the actual likely effect and to the development of avoidance or mitigation measures.
- 2.3 However, the draft CLG guidance² makes it clear that when implementing HRA of land-use plans, the Appropriate Assessment (AA) should be undertaken at a level of detail that is appropriate and proportional to the level of detail provided within the plan itself:
- "The comprehensiveness of the [Appropriate] assessment work undertaken should be proportionate to the geographical scope of the option and the nature and extent of any effects identified. An AA need not be done in any more detail, or using more resources, than is useful for its purpose. It would be inappropriate and impracticable to assess the effects [of a strategic land use plan] in the degree of detail that would normally be required for the Environmental Impact Assessment (EIA) of a project."*
- 2.4 In other words, there is a tacit acceptance that appropriate assessment can be tiered and that all impacts are not necessarily appropriate for consideration to the same degree of detail at all tiers (**Figure 1**).
- 2.5 For an LDF the level of detail concerning the developments that will be delivered is usually insufficient to make a highly detailed assessment of significance of effects. For example, precise and full determination of the impacts and significant effects of a new settlement will require extensive details concerning the design of the town, including layout of greenspace and type of development to be delivered in particular locations, yet these data will not be decided until subsequent stages.
- 2.6 The most robust and defensible approach to the absence of fine grain detail at this level is to make use of the precautionary principle. In other words, the plan is never given the benefit of the

² CLG (2006) Planning for the Protection of European Sites, Consultation Paper

doubt; it must be assumed that a policy/measure is likely to have an impact leading to a significant adverse effect upon a European site unless it can be clearly established otherwise.

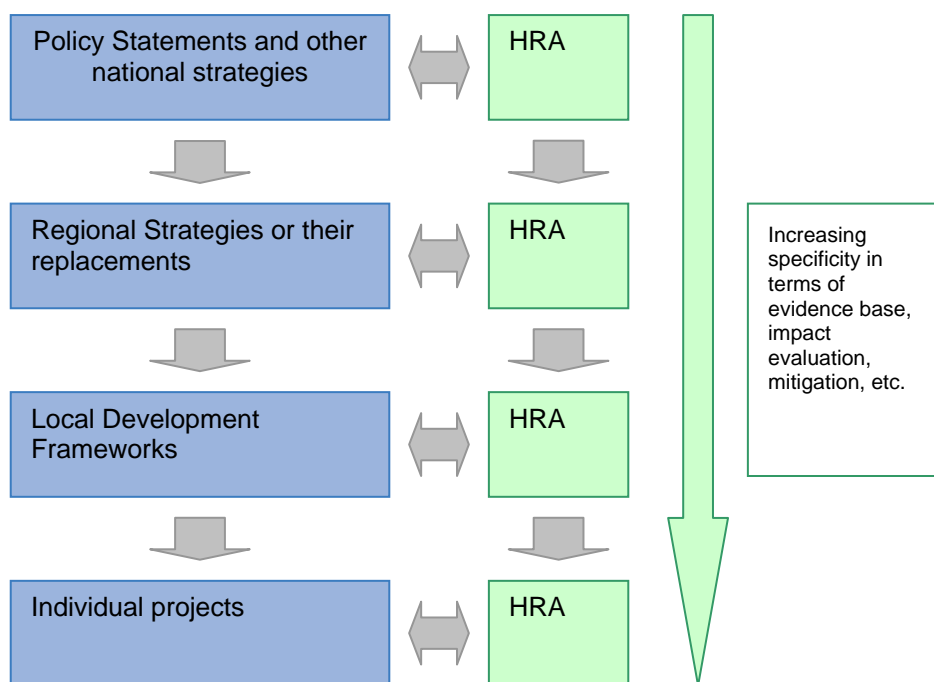


Figure 1: Tiering in HRA of Land Use Plans

The Process of HRA

- 2.7 The HRA is likely to be carried out in the continuing absence of formal Government guidance. CLG released a consultation paper on AA of Plans in 2006³. As yet, no further formal guidance has emerged.
- 2.8 **Figure 2** below outlines the stages of HRA according to current draft CLG guidance. The stages are essentially iterative, being revisited as necessary in response to more detailed information, recommendations and any relevant changes to the plan until no significant adverse effects remain.

³ CLG (2006) Planning for the Protection of European Sites, Consultation Paper

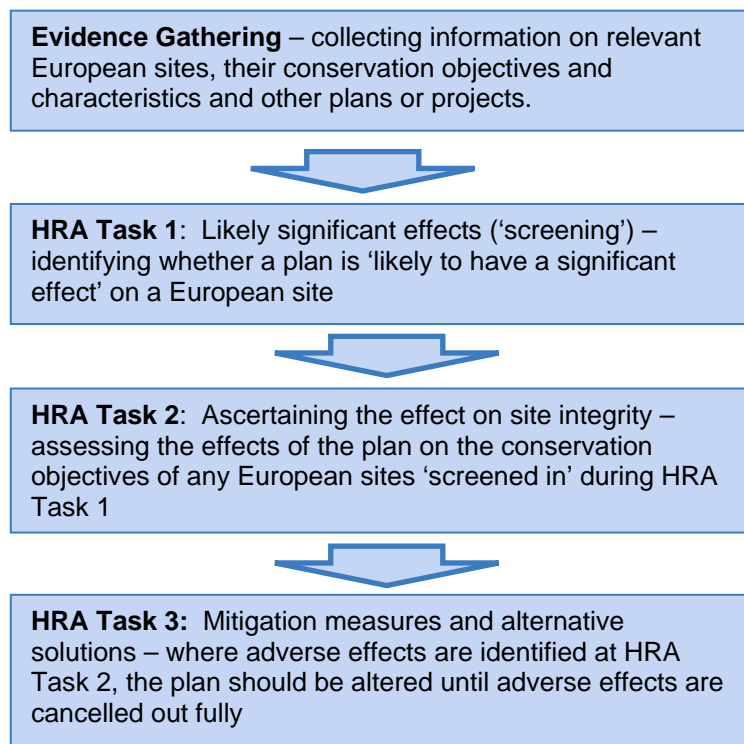


Figure 2: Four-Stage Approach to Habitat Regulations Assessment

2.9 In practice, we and other practitioners have discovered that this broad outline requires some amendment in order to feed into a developing land use plan such as a Core Strategy. The following process has been adopted for carrying out the subsequent stages of the HRA.

Stage Two: Likely Significant Effect Test (Screening)

2.10 This stage is the purpose of the current report.

2.11 The first stage of any Habitat Regulations Assessment is a Likely Significant Effect (LSE) test - essentially a high level risk assessment to decide whether the full subsequent stage known as Appropriate Assessment is required. The essential question is:

"Is the Plan, either alone or in combination with other relevant projects and plans, likely to result in a significant effect upon European sites?"

2.12 The objective is to 'screen out' those plans and projects (or site allocations/policies) that can, without any detailed appraisal, be said to be unlikely to result in significant adverse effects upon European sites, usually because there is no mechanism or pathway for an adverse interaction with European sites. In addition, European sites may be screened out where there is no mechanism or pathway for an adverse effect from any element of a plan or project.

- 2.13 Habitat Regulations Assessment Screening was undertaken by Scott Wilson (June 2009) on the Core Strategy Preferred Options Report. The Core Strategy was screened in with respect to likely significant effects on the Natura 2000 sites listed below in Table 1.

Appropriate Assessment and Mitigation

- 2.14 With regard to those European sites where it was considered not possible to ‘screen out’ the Core Strategy without detailed appraisal, it was necessary to progress to the later ‘Appropriate Assessment’ stage to explore the adverse effects and devise mitigation.
- 2.15 The steps involved are detailed in Box 2.

Box 2. The steps involved in the Appropriate Assessment exercise undertaken for the Rushmoor Core Strategy

1. Explore the reasons for the European designation of these sites.
2. Explore the environmental conditions required to maintain the integrity of the selected sites and become familiar with the current trends in these environmental processes.
3. Gain a full understanding of the plan and its policies and consider each policy within the context of the environmental processes – would the policy lead to an impact on any identified process?
4. Decide if the identified impact will lead to an adverse effect.
5. Identify other plans and projects that might affect these sites in combination with the Plan and decide whether there any adverse effects that might not result from the Plan in isolation will do so “in combination”.
6. Develop measures to avoid the effect entirely, or if not possible, to mitigate the impact sufficiently that its effect on the European site is rendered effectively inconsequential.

- 2.16 In evaluating significance, Scott Wilson have relied on our professional judgement as well as stakeholder consultation. We believe that we are in an excellent position to provide such judgement given our previous experience in undertaking HRA of plans in the East of England, South East and North West at RSS, LDF and Area Action Plan levels.
- 2.17 The level of detail concerning developments that will be permitted under land use plans will never be sufficient to make a detailed quantification of adverse effects. Therefore, we have again taken a precautionary approach (in the absence of more precise data) assuming as the default position that if an adverse effect cannot be confidently ruled out, avoidance or mitigation measures must be provided. This is in line with CLG guidance that the level of detail of the assessment, whilst meeting the relevant requirements of the Habitats Regulations, should be ‘appropriate’ to the level of plan or project that it addresses (see Figure 2 for a summary of this ‘tiering’ of assessment).

- 2.18 When undertaking this part of the assessment it is essential to bear in mind the principal intention behind the legislation i.e. to ensure that those projects or plans which in themselves have minor impacts are not simply dismissed on that basis, but are evaluated for any cumulative contribution they may make to an overall significant effect. In practice, in combination assessment is therefore of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential.

Physical scope of the HRA

- 2.19 The physical scope of the HRA is as shown in Table 1. The location of these European Sites is illustrated in Figures 3 and 4.

Table 1: Physical scope of the HRA

European site	Reason for inclusion
Mersey Estuary SPA/Ramsar Site	Located partly within the Halton Borough Core Strategy Area.
Manchester Mosses SAC	Located adjacent to the M62, which is one of the principal routes into and out of north Merseyside and therefore the north part of Halton
Oak Mere SAC	Located immediately adjacent to the A54 and A49, both of which are busy roads connecting Merseyside to Cheshire.
River Dee & Bala Lake SAC	Identified as a source of potable water for Merseyside.
Sefton Coast SAC	Located within Merseyside, currently subject to recreational pressures.
Dee Estuary SAC SPA & Ramsar site and pSPA extension	Downstream of the River Dee which is identified as a source of potable water for Merseyside.
Mersey Narrows & North Wirral Foreshore pRamsar and pSPA	Located within Merseyside, with hydraulic connections to the Mersey (within Halton Borough Core Strategy Area) and currently subject to recreational pressures.
Ribble & Alt Estuaries SPA and Ramsar site	Located within Merseyside with hydraulic connections to the Mersey (within Halton Borough Core Strategy Area) and currently subject to recreational pressures.
Liverpool Bay SPA	Located immediately adjacent to Merseyside and is therefore a potential water quality pathway through sewage effluent discharges as well as disturbance.
River Eden SAC	Haweswater Lake (to which the River is hydrologically connected) is likely to form part of the future water supply for Merseyside.
Martin Mere SPA	Whilst this is located approximately 20km north of Halton, any renewable energy policies (e.g. wind turbines), alone or in combination have the potential to affect flight paths of qualifying bird species.

- 2.20 No other pathways to European sites have been identified.
- 2.21 Thought was given to including the following European sites but we are currently minded to scope them out of consideration:

- **Rixton Claypits SAC** – Previous HRA Screening of the Core Strategy Preferred Options Report (Scott Wilson, 2009) found no realistic pathway;
- **Midland Meres and Mosses Phase 1 & Phase 2 Ramsar site** Located within 10km of Halton. No realistic pathway has been identified.
- **West Midlands Mosses SAC** - Located close to the A49 and lies within 10km of Halton. However, the A49 is not a direct link between Halton and Cheshire and the site lies more than 200m from the A49 which is outside the core impact zone with regard to local air quality (see Chapter 3 for further discussion of this zone).

2.22 Further details regarding the interest features and vulnerabilities of the European sites included within the scope of the HRA are given below.

2.23 All baseline data relating to these European Sites presented in subsequent sections of this Report is taken from Joint Nature Conservancy Council websites (JNCC) unless otherwise stated. A full reference list of sites used is given in Section 17 (References).

The ‘in combination’ scope

2.24 It is a requirement of the Regulations that the impacts and effects of any land use plan being assessed are not considered in isolation but in combination with other plans and projects that may also be affecting the European site(s) in question. In practice, ‘in combination assessment’ is of greatest importance when the DPD would otherwise be screened out because the individual contribution is inconsequential. It is neither practical nor necessary to assess the ‘in combination’ effects of the DPD within the context of all other plans and projects within the region. The principal other plans and projects that we are considering are:

Projects

- Gwynt Y Mor Offshore Windfarm Project;
- Peel Ports ‘Super Port’;
- Power from Mersey;
- Liverpool John Lennon Airport expansion;
- The Mersey Gateway: Proposed 2nd Mersey Crossing (Halton);
- Proposed incinerators at Runcorn and Ince Marches;
- Frodsham Windfarm;
- Thornton to Switch Island Link Road; and
- Crosby Water Centre, Seaforth Terminal and possible visitor centres at Formby/Marshside

Plans

- The Wales Spatial Plan;
- Draft West Cheshire and North East Wales Sub-Regional Spatial Strategy (2007);
- Liverpool City Region Renewable Energy Capacity Study;

- North West England & North Wales Shoreline Management Plan 2;
- Liverpool LDF Core Strategy;
- Cheshire West and Chester LDF Core Strategy;
- Knowsley LDF Core Strategy;
- Sefton LDF Core Strategy;
- Wirral LDF Core Strategy;
- St Helens Core Strategy;
- Flintshire Unitary Development Plan + Proposed Modifications;
- Denbighshire Unitary Development Plan + Local Development Plan;
- Mersey Heartlands Growth Point Programme of Delivery (Wirral and Liverpool);
- Merseyside Joint Waste Development Plan Document;
- Greater Manchester Joint Waste Development Framework;
- Dee Catchment Abstraction Management Strategy;
- Dee Draft River Basin Management Plan;
- North West River Basin Management Plan;
- United Utilities Water Resource Management Plan;
- West Lancashire Core Strategy;
- Great Ormes Head to Formby Point Shoreline Management Plan (under review);
- Formby Point to River Wyre Shoreline Management Plan (under review);
- Wales Transport Plan; and
- Liverpool and Wirral Waters Development masterplans.

2.25 In practice, in combination assessment is of greatest relevance when the plan would otherwise be screened out because its individual contribution is inconsequential. For the purposes of this assessment, we have determined that, due to the nature of the identified impacts, the key other plans and projects relate to the additional housing and commercial/industrial allocations proposed for other Merseyside authorities over the lifetime of the Core Strategy, and other transport priorities, specifically the expansion of Liverpool John Lennon Airport.

Table 2. Housing to be delivered within Merseyside under current Core Strategy plans

<i>Local Authority</i>	<i>Annual housing average</i>	<i>Total housing from 2003 to 2021</i>
Merseyside	4,470	80,460
Liverpool	1,950	35,100
Knowsley	450	8,100
<i>Halton</i>	<i>600 (until 2017), then 500</i>	<i>8,000</i>

St Helens	570	10,260
Wirral	500	9,000
Sefton	500	9,000 ⁴

2.26 With regard to the specific issue of water resources, the long distance transfer pathways that exist for the supply of water to the Merseyside area and the fact that these same pathways or water sources also supply parts of North Wales, the West Midlands, Manchester, Cumbria and Cheshire, means that development across a much broader area is required for the consideration of water resource impacts ‘in combination’, as follows:

- North East Wales – specific housing levels to be delivered are not mentioned in the Wales Spatial Plan or its 2008 update but a significant increase is likely;
- Greater Manchester area – 185,800 homes to be delivered across Manchester, Salford, Oldham, Rochdale, Tameside, Stockport, Trafford, Congleton, Macclesfield, Bolton, Bury and Wigan between 2003 and 2021;
- West Midlands – potentially up to 445,600 additional homes across the region until 2026;
- West Cumbria – 11,640 homes to be delivered across Allderdale, Barrow-in-Furness and Copeland between 2003 and 2021;
- Cheshire – 31,800 homes to be delivered across Crewe & Nantwich, Chester, Ellesmere Port & Neston and Vale Royal between 2003 and 2021, over half (17,955) within Cheshire West and Chester.

2.27 It should be noted that, while the broad potential impacts of these other projects and plans will be considered, we do not propose carrying out HRA on each of these plans – we will however draw upon existing HRA that have been carried out for surrounding regions and plans.

John Lennon Liverpool Airport Extension

2.28 The expansion of the John Lennon Liverpool Airport is (currently) an explicit element of national government policy as set out in the White Paper 'The Future of Air Transport' (2003). However, Halton does have a Core Strategy policy relating to the expansion and the Airport does lie immediately adjacent to the borough boundary. Due to the location of the airport expansion immediately adjacent to the Mersey Estuary SPA and Ramsar site and the potential for effects on the Mersey Estuary SPA and Ramsar Site, this project is described below.

2.29 The 'Draft Liverpool John Lennon Airport (JLA) Masterplan' (November 2007) shows how the Airport intends to respond to the White Paper's 'The Future of Air Transport' objectives.

2.30 The proposals for 2015 would involve the construction of new terminal facilities, with additional car-parking, as well as new cargo handling and aircraft maintenance facilities, a mixed-use development and hotel. There would also be an extension to the runway, extension of the northern parallel taxiway and additional apron areas and the European Air Transportation Command EATC at the end of the period leading up to 2015. The proposals for 2030 incorporate cargo development and a new parallel taxiway, and further additional apron, terminal and car

⁴ In addition to the 9,000 to be delivered to 2021, the Core Strategy includes a further 2,500 to be delivered by 2026

park areas. There would also be a requirement for an expanded fuel farm facility and a waste water treatment plant to serve the new cargo facilities.

- 2.31 At its western end JLA lies immediately adjacent to the Mersey Estuary SPA and Ramsar. The Masterplan highlights several potential adverse effects on nature conservation and biodiversity which could directly or indirectly affect the favourable status of Mersey Estuary SPA and Ramsar. These effects include: severance of habitats; bird and animal road deaths; pollution to adjacent habitats by road run-off; disturbance to feeding, roosting and breeding birds and bats due to increased lighting; and changes to the hydrology of the area. Potential indirect effects could include: sourcing and transport of construction materials and possibly disturbance to feeding waterfowl during construction, depending on its timing.
- 2.32 Aircraft currently take off or land over the adjacent mudflats. Since these flats are used by a proportion of the passage and wintering waterfowl for which the Estuary is of international importance, there is a potential for an increase in such traffic to effect on the integrity of the SPA/Ramsar site.

3 Pathways of Impact

Introduction

- 3.1 In carrying out an HRA it is important to avoid confining oneself to effectively arbitrary boundaries (such as Local Authority boundaries) but to use an understanding of the various ways in which land use plans can impact on European sites to follow the pathways along which development can be connected with European sites, in some cases many kilometres distant. Briefly defined, pathways are routes by which a change in activity associated with a development can lead to an effect upon a European site. It is also important to bear in mind CLG guidance which states that the AA should be '*proportionate to the geographical scope of the [plan policy]*' and that '*an AA need not be done in any more detail, or using more resources, than is useful for its purpose*' (CLG, 2006, p.6⁵).
- 3.2 The following indirect pathways of impact are considered relevant to the Habitat Regulations Assessment of the Core Strategy.

Disturbance

- 3.3 Habitat Regulation Assessments of Core Strategies tend to focus on recreational sources of disturbance as a result of new residents or an increasingly aging population with more leisure time available. While this is a key factor, other sources of disturbance associated with an increase in commercial development, road transport adjacent to sensitive sites or increases in shipping and aircraft movement may also result.

Breeding birds

- 3.4 Concern regarding the effects of disturbance on birds stems from the fact that they are expending energy unnecessarily and the time they spend responding to disturbance is time that is not spent feeding⁶. Disturbance therefore risks increasing energetic output while reducing energetic input, which can adversely affect the 'condition' and ultimately survival of the birds. In addition, displacement of birds from one feeding site to others can increase the pressure on the resources available within the remaining sites, as they have to sustain a greater number of birds⁷. Moreover, the more time a breeding bird spends disturbed from its nest, the more its eggs are likely to cool and the more vulnerable they, or any nestlings, are to predators.

Wintering birds

- 3.5 The potential for disturbance may be less in winter than in summer, in that there are often a smaller number of recreational users. In addition, the consequences of disturbance at a population level may be reduced because birds are not breeding. However, winter activity can still cause important disturbance, especially as birds are particularly vulnerable at this time of year

⁵ Department for Communities and Local Government. 2006. *Planning for the Protection of European Sites: Appropriate Assessment*. <http://www.communities.gov.uk/index.asp?id=1502244>

⁶ Riddington, R. *et al.* 1996. The impact of disturbance on the behaviour and energy budgets of Brent geese. *Bird Study* 43:269-279

⁷ Gill, J.A., Sutherland, W.J. & Norris, K. 1998. The consequences of human disturbance for estuarine birds. *RSPB Conservation Review* 12: 67-72

due to food shortages, such that disturbance which results in abandonment of suitable feeding areas through disturbance can have severe consequences. Several empirical studies have, through correlative analysis, demonstrated that out-of-season (October-March) recreational activity can result in quantifiable disturbance:

- Tuite et al⁸ found that during periods of high recreational activity, bird numbers at Llangorse Lake decreased by 30% as the morning progressed, matching the increase in recreational activity towards midday. During periods of low recreational activity, however, no change in numbers was observed as the morning progressed. In addition, all species were found to spend less time in their 'preferred zones' (the areas of the lake used most in the absence of recreational activity) as recreational intensity increased.
- Underhill et al⁹ counted waterfowl and all disturbance events on 54 water bodies within the South West London Water Bodies Special Protection Area and clearly correlated disturbance with a decrease in bird numbers at weekends in smaller sites and with the movement of birds within larger sites from disturbed to less disturbed areas.
- Evans & Warrington¹⁰ found that on Sundays total water bird numbers (including shoveler and gadwall) were 19% higher on Stocker's Lake LNR in Hertfordshire, and attributed this to observed greater recreational activity on surrounding water bodies at weekends relative to week days. However, in this study, recreational activity was not quantified in detail, nor were individual recreational activities evaluated separately.
- Tuite et al¹¹ used a large (379 site), long-term (10-year) dataset (September – March species counts) to correlate seasonal changes in wildfowl abundance with the presence of various recreational activities. They found that shoveler was one of the most sensitive species to disturbance. The greatest impact on winter wildfowl numbers was associated with sailing/windsurfing and rowing.

Other activities causing disturbance

- 3.6 Human activity can affect birds either directly (e.g. through causing them to flee) or indirectly (e.g. through damaging their habitat). The most obvious direct effect is that of immediate mortality such as death by shooting, but human activity can also lead to behavioural changes (e.g. alterations in feeding behaviour, avoidance of certain areas *etc.*) and physiological changes (e.g. an increase in heart rate) that, although less noticeable, may ultimately result in major population-level effects by altering the balance between immigration/birth and emigration/death¹².
- 3.7 The degree of impact that varying levels of noise will have on different species of bird is poorly understood except that a number of studies have found that an increase in traffic levels on roads does lead to a reduction in the bird abundance within adjacent hedgerows - Reijnen et al (1995)

⁸ Tuite, C. H., Owen, M. & Paynter, D. 1983. Interaction between wildfowl and recreation at Llangorse Lake and Talybont Reservoir, South Wales. *Wildfowl* 34: 48-63

⁹ Underhill, M.C. *et al.* 1993. *Use of Waterbodies in South West London by Waterfowl. An Investigation of the Factors Affecting Distribution, Abundance and Community Structure.* Report to Thames Water Utilities Ltd. and English Nature. Wetlands Advisory Service, Slimbridge

¹⁰ Evans, D.M. & Warrington, S. 1997. The effects of recreational disturbance on wintering waterbirds on a mature gravel pitlake near London. *International Journal of Environmental Studies* 53: 167-182

¹¹ Tuite, C.H., Hanson, P.R. & Owen, M. 1984. Some ecological factors affecting winter wildfowl distribution on inland waters in England and Wales and the influence of water-based recreation. *Journal of Applied Ecology* 21: 41-62

¹² Riley, J. 2003. Review of Recreational Disturbance Research on Selected Wildlife in Scotland. Scottish Natural Heritage.

examined the distribution of 43 passerine species (i.e. 'songbirds'), of which 60% had a lower density closer to the roadside than further away. By controlling vehicle usage they also found that the density generally was lower along busier roads than quieter roads¹³.

- 3.8 Activities other than recreation may also lead to disturbance of wildlife. Of relevance to the Wirral Core Strategy for example would be noise and visual disturbance from ports and airports, and potentially disturbance from wind farms. Disturbance and displacement from feeding and areas has been demonstrated with regard to wintering geese¹⁴, curlew and hen harriers¹⁵.
- 3.9 The sensitivity of wildlife to the noise of roads and aircraft varies greatly from species to species. However road and airport/aircraft noise can cause some wildlife – notably a range of grassland and woodland birds - to avoid areas near them, reducing the density of those animal populations¹⁶. Elsewhere, reduced breeding success has been recorded.
- 3.10 Large structures (e.g. a new bridge over the Mersey Estuary, offshore and onshore wind turbines), have the potential to alter bird flight paths (e.g. hunting flight paths for raptors, bird migratory paths, regular flight paths between roosting and feeding sites, and foraging routes for bats etc. This may result in a collision risk barrier effect or displacement which could make birds either vulnerable to predation or loss of vital energy stores.
- 3.11 Animals can also be disturbed by the movement of ships. For instance, a DTI study of birds of the North West coast noted that: "Divers and scoters were absent from the mouths of some busier estuaries, notably the Mersey... Both species are known to be susceptible to disturbance from boats, and their relative scarcity in these areas... may in part reflect the volume of boat traffic in these areas"¹⁷.
- 3.12 Disturbing activities are on a continuum. The most disturbing activities are likely to be those that involve irregular, infrequent, unpredictable loud noise events, movement or vibration of long duration. Birds are least likely to be disturbed by activities that involve regular, frequent, predictable, quiet patterns of sound or movement or minimal vibration. The further any activity is from the birds, the less likely it is to result in disturbance.
- 3.13 The factors that influence a species response to a disturbance are numerous, but the three key factors are species sensitivity, proximity of disturbance sources and timing/duration of the potentially disturbing activity.
- 3.14 The distance at which a species takes flight when approached by a disturbing stimulus is known as the 'tolerance distance' (also called the 'escape flight distance') and differs between species to the same stimulus and within a species to different stimuli. These are given in Table 3, which compiles 'tolerance distances' from across the literature. It is reasonable to assume from this that disturbance is unlikely to be experienced more than a few hundred metres from the birds in question. Tolerance distances are unknown for many birds and simple extrapolation to other species is not advised.

¹³ Reijnen, R. et al. 1995. The effects of car traffic on breeding bird populations in woodland. III. Reduction of density in relation to the proximity of main roads. *Journal of Applied Ecology* 32: 187-202

¹⁴ Langston, R.H.W & Pullan, J.D. (2003). Effects of Wind Farms on Birds: Nature and Environment No. 139. Council of Europe.

¹⁵ Madders, M. & Whitfield, D.P. 2006. Upland raptors and the assessment of wind farm impacts. *Ibis* 148 (Suppl. 1), 43-56.

¹⁶ Kaseloo, P. A. and K. O. Tyson. 2004. Synthesis of Noise Effects on Wildlife Populations. FHWA Report.

¹⁷ DTI (2006). Aerial Surveys of Waterbirds in Strategic Wind Farm Areas: 2004/05 Final Report

Table 3 - Tolerance distances of 21 water bird species to various forms of recreational disturbance, as described in the literature. All distances are in metres. Single figures are mean distances; when means are not published, ranges are given. ¹Tydeman (1978), ²Keller (1989), ³Van der Meer (1985), ⁴Wolff et al (1982), ⁵Blankestijn et al (1986).¹⁸

Species	Type of disturbance		
	Rowing boats/kayak	Sailing boats	Walking
Little grebe		60 – 100 ¹	
Great crested grebe	50 – 100 ²	20 – 400 ¹	
Mute swan		3 – 30 ¹	
Teal		0 – 400 ¹	
Mallard		10 – 100 ¹	
Shoveler		200 – 400 ¹	
Pochard		60 – 400 ¹	
Tufted duck		60 – 400 ¹	
Goldeneye		100 – 400 ¹	
Smew		0 – 400 ¹	
Moorhen		100 – 400 ¹	
Coot		5 – 50 ¹	
Curlew			211 ³ ; 339 ⁴ ; 213 ⁵
Shelduck			148 ³ ; 250 ⁴
Grey plover			124 ³
Ringed plover			121 ³
Bar-tailed godwit			107 ³ ; 219 ⁴
Brent goose			105 ³
Oystercatcher			85 ³ ; 136 ⁴ ; 82 ⁵
Dunlin			71 ³ ; 163 ²

¹⁸ Tydeman, C.F. 1978. *Gravel Pits as conservation areas for breeding bird communities*. PhD thesis. Bedford College
 Keller, V. 1989. Variations in the response of Great Crested Grebes *Podiceps cristatus* to human disturbance - a sign of adaptation? *Biological Conservation* 49:31-45
 Van der Meer, J. 1985. *De verstoring van vogels op de slikken van de Oosterschelde*. Report 85.09 Deltadienst Milieu en Inrichting, Middelburg. 37 pp.
 Wolf, W.J., Reijnders, P.J.H. & Smit, C.J. 1982. The effects of recreation on the Wadden Sea ecosystem: many questions but few answers. In: G. Luck & H. Michaelis (Eds.), *Schriftenreihe M.E.L.F., Reihe A: Agnew. Wissensch* 275: 85-107
 Blankestijn, S. et al. 1986. *Seizoensverbreiding in de recreatie en verstoring van Wulp en Scholkester op hoogwatervluchplaatsen op Terschelling*. Report Projectgroep Wadden, L.H. Wageningen. 261pp.

Mechanical/abrasive damage and nutrient enrichment

- 3.15 Most types of aquatic or terrestrial European site can be affected by trampling, which in turn causes soil compaction and erosion. Walkers with dogs contribute to pressure on sites through nutrient enrichment via dog fouling and also have potential to cause greater disturbance to fauna as dogs are less likely to keep to marked footpaths and also tend to move in a more erratic manner. Motorcycle scrambling and off-road vehicle use can cause more serious erosion, as well as disturbance to sensitive species. Boats can also cause some mechanical damage to intertidal habitats through grounding.

Atmospheric pollution

- 3.16 The main pollutants of concern for European sites are oxides of nitrogen (NO_x), ammonia (NH₃) and sulphur dioxide (SO₂). NO_x can have a directly toxic effect upon vegetation. In addition, greater NO_x or ammonia concentrations within the atmosphere will lead to greater rates of nitrogen deposition to soils. An increase in the deposition of nitrogen from the atmosphere to soils is generally regarded to lead to an increase in soil fertility, which can have a serious deleterious effect on the quality of semi-natural, nitrogen-limited terrestrial habitats.

Table 4. Main sources and effects of air pollutants on habitats and species

Pollutant	Source	Effects on habitats and species
Acid deposition	SO ₂ , NO _x and ammonia all contribute to acid deposition. Although future trends in S emissions and subsequent deposition to terrestrial and aquatic ecosystems will continue to decline, it is likely that increased N emissions may cancel out any gains produced by reduced S levels.	Can affect habitats and species through both wet (acid rain) and dry deposition. Some sites will be more at risk than others depending on soil type, bed rock geology, weathering rate and buffering capacity.
Ammonia (NH ₃)	Ammonia is released following decomposition and volatilisation of animal wastes. It is a naturally occurring trace gas, but levels have increased considerably with expansion in numbers of agricultural livestock. Ammonia reacts with acid pollutants such as the products of SO ₂ and NO _x emissions to produce fine ammonium (NH ₄ ⁺)- containing aerosol which may be transferred much longer distances (can therefore be a significant trans-boundary issue.)	Adverse effects are as a result of nitrogen deposition leading to eutrophication. As emissions mostly occur at ground level in the rural environment and NH ₃ is rapidly deposited, some of the most acute problems of NH ₃ deposition are for small relict nature reserves located in intensive agricultural landscapes.
Nitrogen oxides NO _x	Nitrogen oxides are mostly produced in combustion processes. About one quarter of the UK's emissions are from power stations, one-half from motor vehicles, and the rest from other industrial and domestic combustion processes.	Deposition of nitrogen compounds (nitrates (NO ₃), nitrogen dioxide (NO ₂) and nitric acid (HNO ₃)) can lead to both soil and freshwater acidification. In addition, NO _x can cause eutrophication of soils and water. This alters the species composition of plant communities and can eliminate sensitive

Pollutant	Source	Effects on habitats and species
		species.
Nitrogen (N) deposition	The pollutants that contribute to nitrogen deposition derive mainly from NO _x and NH ₃ emissions. These pollutants cause acidification (see also acid deposition) as well as eutrophication.	Species-rich plant communities with relatively high proportions of slow-growing perennial species and bryophytes are most at risk from N eutrophication, due to its promotion of competitive and invasive species which can respond readily to elevated levels of N. N deposition can also increase the risk of damage from abiotic factors, e.g. drought and frost.
Ozone (O ₃)	A secondary pollutant generated by photochemical reactions from NO _x and volatile organic compounds (VOCs). These are mainly released by the combustion of fossil fuels. The increase in combustion of fossil fuels in the UK has led to a large increase in background ozone concentration, leading to an increased number of days when levels across the region are above 40ppb. Reducing ozone pollution is believed to require action at international level to reduce levels of the precursors that form ozone.	Concentrations of O ₃ above 40 ppb can be toxic to humans and wildlife, and can affect buildings. Increased ozone concentrations may lead to a reduction in growth of agricultural crops, decreased forest production and altered species composition in semi-natural plant communities.
Sulphur Dioxide SO ₂	Main sources of SO ₂ emissions are electricity generation, industry and domestic fuel combustion. May also arise from shipping and increased atmospheric concentrations in busy ports. Total SO ₂ emissions have decreased substantially in the UK since the 1980s.	Wet and dry deposition of SO ₂ acidifies soils and freshwater, and alters the species composition of plant and associated animal communities. The significance of impacts depends on levels of deposition and the buffering capacity of soils.

- 3.17 Sulphur dioxide emissions are overwhelmingly influenced by the output of power stations and industrial processes that require the combustion of coal and oil, as well (particularly on a local scale) as shipping.
- 3.18 Ammonia emissions are dominated by agriculture, with some chemical processes also making notable contributions. As such, it is unlikely that material increases in SO₂ or NH₃ emissions will be associated with Local Development Frameworks. NO_x emissions, however, are dominated by the output of vehicle exhausts (more than half of all emissions). Within a 'typical' housing development, by far the largest contribution to NO_x (92%) will be made by the associated road traffic. Other sources, although relevant, are of minor importance (8%) in comparison¹⁹. Emissions of NO_x could therefore be reasonably expected to increase as a result of greater vehicle use as an indirect effect of the LDF.
- 3.19 According to the World Health Organisation, the critical NO_x concentration (critical threshold) for the protection of vegetation is 30 µgm⁻³; the threshold for sulphur dioxide is 20 µgm⁻³. In addition,

¹⁹ Proportions calculated based upon data presented in Dore CJ et al. 2005. UK Emissions of Air Pollutants 1970 – 2003. UK National Atmospheric Emissions Inventory. <http://www.airquality.co.uk/archive/index.php>

ecological studies have determined 'critical loads'²⁰ of atmospheric nitrogen deposition (that is, NO_x combined with ammonia NH₃).

3.20 The National Expert Group on Transboundary Air Pollution (2001)²¹ concluded that:

- In 1997, critical loads for acidification were exceeded in 71% of UK ecosystems. This was expected to decline to 47% by 2010.
- Reductions in SO₂ concentrations over the last three decades have virtually eliminated the direct impact of sulphur on vegetation.
- By 2010, deposited nitrogen was expected to be the major contributor to acidification, replacing the reductions in SO₂.
- Current nitrogen deposition is probably already changing species composition in many nutrient-poor habitats, and these changes may not readily be reversed.
- The effects of nitrogen deposition are likely to remain significant beyond 2010.
- Current ozone concentrations threaten crops and forest production nationally. The effects of ozone deposition are likely to remain significant beyond 2010.
- Reduced inputs of acidity and nitrogen from the atmosphere may provide the conditions in which chemical and biological recovery from previous air pollution impacts can begin, but the timescales of these processes are very long relative to the timescales of reductions in emissions.

3.21 Grice et al^{22 23} do however suggest that air quality in the UK will improve significantly over the next 15 years due primarily to reduced emissions from road transport and power stations.

²⁰ The critical load is the rate of deposition beyond which research indicates that adverse effects can reasonably be expected to occur

²¹ National Expert Group on Transboundary Air Pollution (2001) Transboundary Air Pollution: Acidification, Eutrophication and Ground-Level Ozone in the UK.

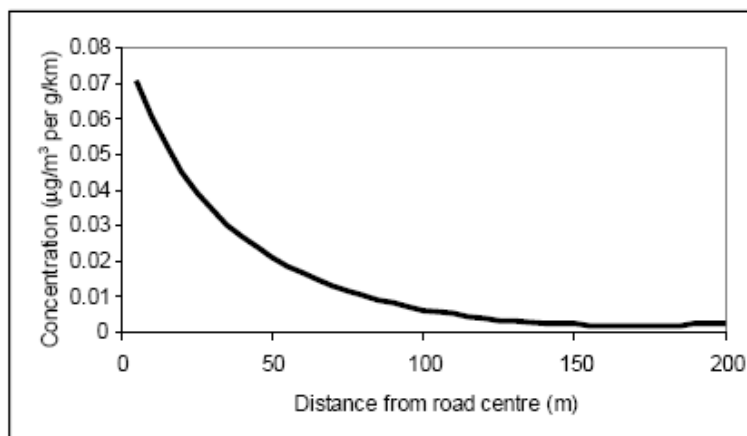
²² Grice, S., T. Bush, J. Stedman, K. Vincent, A. Kent, J. Targa and M. Hobson (2006) Baseline Projections of Air Quality in the UK for the 2006 Review of the Air Quality Strategy, report to the Department for Environment, Food and Rural Affairs, Welsh Assembly Government, the Scottish Executive and the Department of the Environment for Northern Ireland.

²³ Grice, S., J. Stedman, T. Murrells and M. Hobson (2007) Updated Projections of Air Quality in the UK for Base Case and Additional Measures for the Air Quality Strategy for England, Scotland, Wales and Northern Ireland 2007, report to the Department for Environment, Food and Rural Affairs, Welsh Assembly Government, the Scottish Executive and the Department of the Environment for Northern Ireland.

Local air pollution

- 3.22 According to the Department of Transport's Transport Analysis Guidance, "*Beyond 200m, the contribution of vehicle emissions from the roadside to local pollution levels is not significant*"²⁴.

Figure 5. Traffic contribution to concentrations of pollutants at different distances from a road (Source: DfT)



- 3.23 This is therefore the distance that has been used throughout this HRA in order to determine whether European sites are likely to be significantly affected by traffic generated by development under the Core Strategy. Such a distance threshold cannot currently be applied to shipping emissions and we must therefore restrict ourselves to assuming that the presence of a pathway indicates a possible issue.

Diffuse air pollution

- 3.24 In addition to the contribution to local air quality issues, development can also contribute cumulatively to an overall change in background air quality across an entire region (although individual developments and plans are – with the exception of large point sources such as power stations – likely to make very small individual contributions). In July 2006, when this issue was raised by Runnymede District Council in the South East, Natural England advised that their Local Development Framework '*can only be concerned with locally emitted and short range locally acting pollutants*'²⁵ as this is the only scale which falls within a local authority remit. It is understood that this guidance was not intended to set a precedent, but it inevitably does so since (as far as we are aware) it is the only formal guidance that has been issued to a Local Authority from any Natural England office on this issue.
- 3.25 In the light of this and our own knowledge and experience, it is considered reasonable to conclude that it must be the responsibility of higher-tier plans to set a policy framework for addressing the cumulative diffuse pan-authority air quality impacts, partly because such impacts stem from the overall quantum of development within a region (over which individual districts

²⁴ www.webtag.org.uk/archive/feb04/pdf/feb04-333.pdf

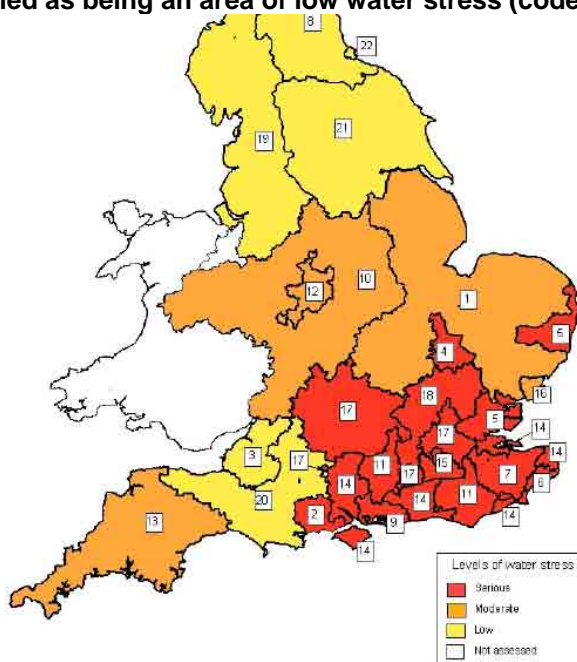
²⁵ English Nature (16 May 2006) letter to Runnymede Borough Council, 'Conservation (Natural Habitats &c.) Regulations 1994, Runnymede Borough Council Local Development Framework'.

have little control), and since this issue can only practically be addressed at the highest pan-authority level. Diffuse air quality issues will not therefore be considered further within this HRA.

Water resources

3.26 The North West is generally an area of low water stress (see Figure 6).

Figure 6. Areas of water stress within England. It can be seen from this map that Merseyside is classified as being an area of low water stress (coded yellow).²⁶



3.27 Initial investigation indicates that Halton lies within United Utilities' Integrated Resource Zone which serves 6.5 million people in south Cumbria, Lancashire, Greater Manchester, Merseyside and most of Cheshire. The Integrated Zone is supplied with around 1800 Ml/d of drinking water, of which about 500 Ml/d comes from water sources in Wales, about 600 Ml/d comes from sources in Cumbria, and the rest from sources in other parts of North West England. It constitutes a large integrated supply network that enables substantial flexibility in distributing supplies within the zone. The construction of the 'west to east link' will further aid this flexibility and thus break the traditional division in which Greater Manchester received water from Cumbria and Merseyside received water from the River Dee (which lies partly in England and partly in Wales) and from purely Welsh sources (e.g. Lake Vyrnwy).

3.28 In exploring water resource issues relating to Welsh European sites for St Helens Council, we determined from United Utilities that approximately 75% of St. Helens potable water supply is currently abstracted from the River Dee, 20% is abstracted from Lake Vyrnwy and only 5% is abstracted from sites in Cumbria. It is likely that similar proportions relate to Halton although this is likely to change in the future as a result of the greater flexibility provided by the west-east link.

²⁶ Figure adapted from Environment Agency. 2007. Identifying Areas of Water Stress. <http://publications.environment-agency.gov.uk/pdf/GEHO0107BLUT-e-e.pdf>

In any case, Cumbrian and Welsh sources will still be involved in one ratio or another in water supply to Halton.

- 3.29 The River Dee is a Special Area of Conservation and flows into the Dee Estuary which is also designated as an SAC as well as an SPA (and pSPA extension) and Ramsar site. Four water companies abstract from sources that affect the River Dee including United Utilities (UU), Dee Water Valley, Welsh Water and Severn Trent Water. Excessive abstraction from the Dee could therefore result in sufficient drawdown of water to damage the interest features of the River Dee and Bala Lake SAC (through desiccation, fish entrainment or a deterioration in water quality due to the lower proportion of freshwater to sediment) and in turn reduce freshwater flows into the Dee Estuary to such a degree as to damage the interest features of that site through an increase in salinity.
- 3.30 In the future as a result of the west-east link, Merseyside (including Halton) will obtain a much greater proportion of its water supply from Lake District sources. This is likely to involve Haweswater as a principal reservoir. Haweswater is within the catchment of the River Eden SAC and thus we have also included consideration of drawdown and reduced flow impacts on this designated site in this report.

Water quality

- 3.31 The Sewage Treatment Works (STWs) that serve Halton all discharge into the Mersey either within or slightly upstream of the Mersey Estuary SPA/Ramsar site and 23km upstream of Liverpool Bay SPA and Mersey Narrows & North Wirral Foreshore pSPA and pRamsar site.
- 3.32 Increased amounts of housing or business development can lead to reduced water quality of rivers and estuarine environments. Sewage and industrial effluent discharges can contribute to increased nutrients on European sites leading to unfavourable conditions. In addition, diffuse pollution, partly from urban run-off, has been identified during an Environment Agency Review of Consents process as being a major factor in causing unfavourable condition of European sites.
- 3.33 The quality of the water that feeds European sites is an important determinant of the nature of their habitats and the species they support. Poor water quality can have a range of environmental impacts:
- At high levels, toxic chemicals and metals can result in immediate death of aquatic life, and can have detrimental effects even at lower levels, including increased vulnerability to disease and changes in wildlife behaviour. Eutrophication, the enrichment of plant nutrients in water, increases plant growth and consequently results in oxygen depletion. Algal blooms, which commonly result from eutrophication, increase turbidity and decrease light penetration. The decomposition of organic wastes that often accompanies eutrophication deoxygenates water further, augmenting the oxygen depleting effects of eutrophication. In the marine environment, nitrogen is the limiting plant nutrient and so eutrophication is associated with discharges containing available nitrogen; in the freshwater environment, phosphorus is usually a principal cause of eutrophication.
 - Some pesticides, industrial chemicals, and components of sewage effluent are suspected to interfere with the functioning of the endocrine system, possibly having negative effects on the reproduction and development of aquatic life, and subsequently bird life.

- Increased discharge of treated sewage effluent can result both in greater scour (as a result of greater flow volumes) and in high levels of macroalgal growth, which can smother the mudflats of value to SPA birds.
- 3.34 For sewage treatment works close to capacity, further development may increase the risk of effluent escape into aquatic environments. In many urban areas, sewage treatment and surface water drainage systems are combined, and therefore a predicted increase in flood and storm events could increase pollution risk.
- 3.35 However, it is also important to note that the situation is not always simple – for sites designated for waterfowl, a STW discharge can actually be a useful source of food and birds will often congregate around the outfall²⁷. In addition, while nutrient enrichment does cause considerable problems on the south coast (particularly in the Solent) due to the abundance of smothering macroalgae that is produced, it is not necessarily a problem in other areas where the macroalgae are broken up by tidal wave action and where colder and more turbid water limit the build-up in the first place. For example, although The Wash in the East of England is hypernutrified the Environment Agency Review of Consents process has identified that this is not leading to adverse effects on the internationally important interest features of the site.
- 3.36 Nonetheless, at this stage water quality impacts are considered to be an issue that requires investigation.

Port and Channel Construction, Maintenance Shipping and Dredging

- 3.37 The construction and maintenance of ports and inland shipping channels poses a number of environmental risks²⁸. Of particular importance is the dredging necessary to permit large vessels to enter ports, or to maintain inland channels. In natural estuaries and harbours, there is a balance between sediment transported out to sea and that which flows in with rivers and runoff, which tends to maintain an equilibrium depth. Often this is not deep enough to allow vessels safe passage, so navigational channels and harbours are dredged to deepen them. Because natural forces will tend to build up sediment until the channels and port return to their equilibrium, dredging to maintain safe depth is an ongoing maintenance activity. The need for such dredging is likely to increase in the future as ships become larger and require deeper ports or as inland water transport grows in importance.
- 3.38 Dredging poses direct threats to the areas in which it occurs. It introduces sediment into the adjacent water column, which is then redeposited on the bottom. This has a variety of usually short-term effects on pelagic fish and the benthic community. The suspended sediment increases turbidity, decreasing light penetration and photosynthetic activity. Dredging can also have longer term effects on water circulation patterns, particularly in estuarine areas where water circulation determines the distribution of fresh and salt water, patterns of dissolved oxygen, and other water quality parameters. Changes in salinity can affect the viability of freshwater wetlands and tidal marshes, with consequent impacts on the distribution of marine life. Changes in water circulation

²⁷ Anecdotal observation from the author's work on numerous sewage treatment works around the county (particularly London) and bird surveys undertaken by the author and colleagues on such sites

²⁸ OECD (ORGANISATION FOR ECONOMIC CO-OPERATION AND DEVELOPMENT) (1997) The Environmental Effects of Freight available from <http://www.oecd.org/dataoecd/14/3/2386636.pdf> (Accessed June 2010)(p17)

patterns can also alter sediment accumulation, thus affecting all ecosystems in the immediate area²⁹

- 3.39 Dredging for marine minerals has occurred in UK waters for many years, in response to the need for sand and gravel used as construction aggregate and for beach replenishment, including the Mersey. Mersey Silt has historically been identified as having a possible contribution to the supply of construction aggregates in north-west England³⁰.including as a concreting or mortaring sand as coarse aggregate or bricks.
- 3.40 The development of Mersey Gateway Port (Western Docks) as part of the policy to develop West Runcorn (CS9), and encourage greater use of Manchester Ship Canal for freight has the potential to result in disturbance of sediment releasing legacy heavy metal pollution (mercury, lead, cadmium and other poisons) that is bound into the sediment, or other introduction of these metals. Policies that encourage more freight by shipping also have the potential to result in pollution through fuel emissions, and accidental spillages.
- 3.41 As a precaution these pathways have been considered in this report.

Coastal squeeze

- 3.42 Rising sea levels can be expected to cause intertidal habitats (principally saltmarsh, sand dunes and intertidal mudflats) to migrate landwards. However, in built-up areas, such landward retreat is often rendered impossible due the presence of the sea wall and other flood defences. In addition, development frequently takes place immediately behind the sea wall, so that the flood defences cannot be moved landwards to accommodate managed retreat of threatened habitats. The net result is that the quantity of saltmarsh, sand dunes and mudflat adjacent to built-up areas will progressively decrease as sea levels rise. This process is known as 'coastal squeeze'. In areas where sediment availability is reduced, the 'squeeze' also includes an increasingly steep beach profile and foreshortening of the seaward zones.
- 3.43 Intertidal habitat loss is mainly occurring in the south and east of the country, particularly between the Humber and Severn. Northwest England, south Wales, the Solent in Hampshire, the southeast around the Thames estuary and large parts of East Anglia are also affected but to a lesser degree.
- 3.44 Defra's current national assessment is that the creation of an annual average of at least 100 ha of intertidal habitat associated with European sites in England that are subject to coastal squeeze, together with any more specifically identified measures to replace losses of terrestrial and supra-tidal habitats, is likely to be required to protect the overall coherence of the Natura 2000 network. This assessment takes account of intertidal habitat loss from European sites in England that is caused by a combination of all flood risk management structures and sea level rise. The

²⁹ Marine Board, Commission on Engineering and Technical Systems, National Research Council (1985), Dredging Coastal Ports: An Assessment of the Issues. (Washington, D.C.: National Academy Press) (pp124-128)

³⁰ P.F.G. Banfill* and A.C. Benson (Department of Building Engineering),(1979). Alternative aggregate materials: Properties of Mersey Silt Building and Environment (Volume 14, Issue 3, 1979, Pages 203-208)

assessment will be kept under review taking account of the certainty of any adverse effects and monitoring of the actual impacts of plans and projects¹⁶.

- 3.45 Coastal squeeze cannot be assessed in detail until actual site allocations exist, but it can be at least broadly considered in the HRA of the Core Strategy.

¹⁶ Defra. 2005. Coastal Squeeze – Implications for Flood Management.
<http://www.defra.gov.uk/environ/fcd/policy/csqueeze.pdf>

4 Summary of screening

4.1 The Core Strategy was screened in for Appropriate Assessment covering recreational pressures, direct disturbance, deterioration in water quality, loss of supporting habitat and deterioration in air quality. Some Core Strategy policies may act in combination with each other (e.g. Sustainable Transport and Green Infrastructure encouraging recreational use of the Merseyway cycle/footpaths). The following policies are screened in therefore requiring Appropriate Assessment:

- Halton's Spatial Strategy CS1;
- Housing Supply and Locational Priorities CS3;
- Employment Land Supply and Locational Priorities CS3;
- A Network of Centres for Halton CS4;
- Infrastructure Provision CS5;
- 3MG (Mersey Multimodal Gateway) CS6;
- South Widnes CS7;
- East Runcorn CS8;
- West Runcorn CS9;
- Minerals CS26;
- Meeting the Needs of Gypsies, Travellers and Travelling Show People CS12;
- The Mersey Gateway Project CS15;
- Liverpool John Lennon Airport CS16; and
- Sustainable Development and Climate Change CS18.

4.2 These policies may interact with other plans and policies which have been identified to have the potential to have similar impacts on the European sites, thus creating an exacerbated 'in combination' effect.

4.3 The following policies are screened out therefore not requiring Appropriate Assessment:

- Waste CS25 – screened out on the basis that the Merseyside Joint Waste DPD is being subject to its own Appropriate Assessment;
- Sustainable Transport and Travel CS14;
- Green Infrastructure CS21;
- Affordable Housing CS10;
- Housing Mix;
- Green Belt;
- Sustainable Development Principles;

- High Quality Design CS19;
- Halton's Natural and Historic Environments CS20;
- Health and Well-Being CS22; and
- Managing Pollution and Risk CS23.

4.4 This is because no pathway has been identified between these policies and European sites.

5 Mersey Estuary SPA and Ramsar

Introduction

- 5.1 Figures 3 and 4 show the location of the Mersey Estuary SPA and Ramsar site, and the extent to which it is located within the Borough of Halton. The Mersey Estuary is a large sheltered estuary that receives drainage from a catchment area of c.5,000km² encompassing the conurbations of Liverpool and Manchester, and including the River Mersey and the River Bollin and their tributaries in Cheshire and Merseyside. The Estuary covers 5023.35ha of saltmarsh and intertidal sand and mudflats, with limited areas of brackish marsh, rocky shoreline and boulder clay cliffs, within a rural and industrial environment. The intertidal flats and saltmarshes provide feeding and roosting sites for large and internationally important populations of waterbirds, and during the winter, the site is of major importance for duck and waders. The site is also important during the spring and autumn migration periods, particularly for wader populations moving along the west coast of Britain.

Reasons for Designation

- 5.2 The Mersey Estuary is designated an SPA under Article 4.1³¹
- Golden plover (*Pluvialis apricaria*): 3,040 individuals (1.2% of GB population)
- 5.3 SPA Article 4.2 - winter:
- Redshank (*Tringa totanus*): 4,993 individuals (2.8% of Eastern Atlantic population)
 - Dunlin (*Calidris alpina*): 48,789 individuals (3.6% of Northern Siberian / Europe / West African population)
 - Pintail (*Anas acuta*): 1,169 individuals (1.9% of NW European population)
 - Shelduck (*Tadorna tadorna*): 6,746 individuals (2.2% of wintering NW European population)
 - Eurasian teal (*Anas crecca*): 11,723 individuals (2.9% of NW European population)
 - Wigeon (*Anas penelope*): 11,886 individuals (4.2% of the GB population) Black-tailed godwit (*Limosa limosa*): 976 individuals (1.6% of the Iceland population)
 - Curlew (*Numenius arquata*): 1,300 individuals (1.1% of the GB population)
 - Grey plover (*Pluvialis squatarola*): 1,010 individuals (2.3% of the GB population)
 - Great crested grebe (*Podiceps cristatus*): 136 individuals (1.4% of the GB population)
 - Lapwing (*Vanellus vanellus*): 10,544 individuals (0.7% of the GB population)
- 5.4 SPA Article 4.2 - on passage:
- Ringed plover (*Charadrius hiaticula*): 505

³¹ All bird count data in this document is sourced from the SPA Review site accounts as available on the Joint Nature Conservation Committee website www.jncc.gov.uk/page-1412

5.5 Ramsar Criterion 6, Internationally important populations of:

- Shelduck
- Black-tailed godwit (*Limosa limosa*)
- Redshank
- Eurasian teal
- Pintail
- Dunlin

5.6 Ramsar Criterion 5:

- 89,576 waterfowl (5-year peak mean 1998/99-2002/03)

5.7 Birdlife (2001) identify the Important Bird Area (IBA) to exceed the area currently designated as a Ramsar site, and recommend the designation expansion. This additional area is termed a 'potential Ramsar' (which precedes the 'proposed' Ramsar (pRamsar) designation). This additional area is not considered in the assessment as objectives and site boundaries are unconfirmed, however its status highlights the nature conservation value of areas of the Mersey outside of the SPA/Ramsar designation.

Historic Trends and Existing Pressures

5.8 Appendix 2 illustrates the extent of the Mersey Catchment. Water pollution has been an issue in the Mersey Estuary since at least the 18th century, when the Mersey catchment became a prime location for industrial expansion, especially the textile industry. With this there was an associated growth in bleaching, dying, and finishing trades, and paper, heavy chemical and glass industries, which are still in production to this day. All of these industries used the waterways as a means for the disposal of industrial waste, resulting in a legacy of pollutants within the River Mersey and including mercury, pesticides (e.g. DDT), and persistent organic contaminants (e.g. polychlorinated biphenyls (PCBs), pentachlorophenol (PCP)). In addition, there was surface runoff, and the discharge of domestic waste-water and sewage directly into the waterways from a large and growing human population, resulting in gross pollution³². The high levels of sewage discharged in to the waterways resulted in low oxygen levels and a major difficulty in improving water quality.

5.9 The problem of water pollution in the Mersey Estuary 'was probably at its worst in the 1960's' and made it the most polluted Estuary in the UK (Mersey Basin Campaign 2004). Major improvements to water quality have been realised since the formation of the Mersey Basin Campaign in 1985, which aims to 'revitalise the River Mersey and its waterfront'³³.

³² Langston, W.J., Chesman, B.S. and Burt, G.R. (2006). Characterisation of European Marine Sites. Mersey Estuary SPA. [Online]. *Marine Biological Association of the United Kingdom. Occasional Publications 18*, 185pp. Available at: www.mba.ac.uk/nmb/publications/occpub/pdf/occ_pub_18.pdf (accessed 15th June 2009).

³³ Langston, W.J., Chesman, B.S. and Burt, G.R. (2006). Characterisation of European Marine Sites. Mersey Estuary SPA. [Online]. *Marine Biological Association of the United Kingdom. Occasional Publications 18*, 185pp. Available at:

- 5.10 The major projects that brought about the improvements to water quality tackled the direct discharges of sewage into the region's waterways. New projects included: primary sewage works at Sandon Dock which replaced 28 crude sewage discharges directly into the Mersey Estuary through the MEPAS scheme (Mersey Estuary Pollution Alleviation Scheme); fine sewage screening plants on the Wirral peninsula; secondary sewage treatment and petrochemical effluent treatment plants at Ellesmere Port; secondary sewage treatment plants at Widnes and Warrington; modification of the Davyhulme sewage treatment plan in Greater Manchester to treat ammonia (which may kill salmonid species); and later secondary sewage treatment plants at Birkenhead/Bromborough. Other improvements have been made, including reducing inputs of mercury, lead, cadmium, PCP and chlorinated hydrocarbons into the Estuary.
- 5.11 However, certain inputs remain, including:
- pesticides and herbicides from agriculture (largely dairy farming) into the upper river system;
 - phthalate esters (used as plasticisers, increasing flexibility in plastics) thought to come from wastewater discharges in the upper Mersey;
 - hydrocarbon contamination from oil spillage/spills from Tranmere Oil Dock/Terminal, Stanlow (Shell) Oil Refinery and oil tanks along the southern bank of the Estuary, from pipelines that run between these sites along the southern bank of the Estuary, and from oil shipping spills in the Irish Sea;
 - PCB³⁴s from the River Mersey (possibly also dredge spoils); and
 - PCBs from contaminated land in the catchment area³⁵
- 5.12 The General Quality Assessment (GQA) scheme, introduced by the National Rivers Authority (NRA), and replaced by the Environment Agency (EA) in 1996, monitors the water quality of rivers and canals throughout England and Wales. It assesses the chemical and biological status, nutrient levels, and aesthetic water quality from permanent sampling stations. The Mersey Basin Campaign (2005) reports on sites in the Mersey catchment that detail low (Grades D, E and F, or 'fair' to 'bad') biological and chemical river water quality; only those within the Mersey catchment – see Appendix 2 – are described here. Such sampling sites are particularly concentrated in the area between Knowsley and Manchester, including St. Helens and Wigan, although biological quality is generally poor from Liverpool to Manchester.
- 5.13 The main current environmental pressures upon the Mersey Estuary SPA and Ramsar site are considered to be:
- disturbance of sediment releasing legacy heavy metal pollution (mercury, lead, cadmium and other poisons) that is bound into the sediment, or other introduction of these metals;
 - pollution via rivers and drains by both treated sewerage and untreated runoff containing inorganic chemicals and organic compounds from everyday domestic products, which 'may

www.mba.ac.uk/nmb/publications/occpub/pdf/occ_pub_18.pdf (accessed 15th June 2009).

³⁴ Polychlorinated biphenyl are toxic persistent organic pollutants used in industry as dielectric fluids for transformers, capacitors, coolants can bioaccumulate in the sublittoral prey species of the common scoter and bioaccumulate/ biomagnify in the fish species

³⁵ Langston, W.J., Chesman, B.S. and Burt, G.R. (2006). Characterisation of European Marine Sites. Mersey Estuary SPA. [Online]. *Marine Biological Association of the United Kingdom. Occasional Publications* 18, 185pp. Available at : www.mba.ac.uk/nmb/publications/occpub/pdf/occ_pub_18.pdf (accessed 15th June 2009).

combine together in ways that make it difficult to predict their ultimate effect of the marine environment. Some may remain indefinitely in the seawater, the seabed, or the flesh, fat and oil of sea creatures³⁶;

- pollution via commercial shipping by chemical pollution and the dumping of litter at sea;
- 'coastal squeeze' and physical loss from land reclamation and coastal flood defences and drainage used in order to develop coastal land, and from sea level rise;
- loss or physical damage of marine benthic habitat directly and indirectly (through changed sedimentation/deposition patterns) as a result of navigational or aggregate dredging;
- disturbance to birds from increased recreational pressure (e.g. boat or other recreational activity) and wildfowling;
- introduction of non-native species; and
- selective removal of species (e.g. bait digging, wildfowl, fishing)³⁷

5.14 Although the Mersey Estuary does have a high load of nutrients mainly from diffuse sources, with levels for phosphate and nitrogen decreasing from point sources, recent modelling has shown that due to the natural turbidity of the water, there is only a low risk of excessive algal growth.

Key Potential Pressures from Halton

5.15 From the environmental requirements that have been identified above it can be determined that the following impacts of development in Halton could interfere with the environmental requirements and processes on the SPA/Ramsar Site:

- 'coastal squeeze' and loss of supporting habitat associated with development on the Mersey including 'Key Areas of Change (Widnes, Runcorn, 3MG) and identified 'Employment Areas'; land reclamation, coastal flood defences, aggregate extraction;
- excessive recreational pressure resulting from enhanced connectivity across the Mersey and encouraging greater use of Merseyway footpaths/cycle tracks;
- pollution via rivers and drains by both treated sewerage and untreated runoff containing inorganic chemicals and organic compounds from everyday domestic products, which '*may combine together in ways that make it difficult to predict their ultimate effect of the marine environment... Some may remain indefinitely in the seawater, the seabed, or the flesh, fat and oil of sea creatures*';
- pollution arising from construction of Mersey Gateway Bridge/Mersey Gateway Port (Runcorn);

³⁶ Langston, W.J., Chesman, B.S. and Burt, G.R. (2006). Characterisation of European Marine Sites. Mersey Estuary SPA. [Online]. *Marine Biological Association of the United Kingdom. Occasional Publications 18*, 185pp. Available at: www.mba.ac.uk/nmbi/publications/occpub/pdf/occ_pub_18.pdf (accessed 15th June 2009).

³⁷ Langston, W.J., Chesman, B.S. and Burt, G.R. (2006). Characterisation of European Marine Sites. Mersey Estuary SPA. [Online]. *Marine Biological Association of the United Kingdom. Occasional Publications 18*, 185pp. Available at : www.mba.ac.uk/nmbi/publications/occpub/pdf/occ_pub_18.pdf (accessed 15th June 2009).

- disturbance of sediment releasing legacy heavy metal (lead, cadmium, arsenic and other poisons) pollution that is bound into the sediment from greater shipping freight/aggregate extraction;
- alternation of hydrological table from increase in hard standing/flood defence and/or increased water abstraction (for sources other than Public Water Supply) and/or mineral extraction;
- potential displacement of birds through Mersey Gateway Construction/Liverpool John Lennon Airport expansion/wind turbine development and aggregate extraction; and
- deterioration in local air quality and thus increased nitrogen deposition (from greater cross-river travel, air travel).

Role of other plans and projects

5.16 The following plans and projects are considered to have the potential to act upon the SPA/Ramsar site 'in combination':

Projects

- Peel Ports 'Super Port' – potential impacts due to increased sulphur deposition from shipping, physical disturbance of habitat, mobilisation of contamination, possible disturbance of waterfowl from noise and shipping activity;
- Liverpool John Lennon Airport expansion – potential impacts due to increased sulphur and nitrogen deposition from aircraft, loss of supporting foraging/high-tide roost habitat and possible disturbance of waterfowl from noise;
- The Mersey Gateway: Proposed 2nd Mersey Crossing (Halton) – potential impacts due to direct landtake, changes in hydrodynamics of river flow, noise and visual disturbance during construction and operation;
- Power from Mersey – potential impacts due to changes in hydrodynamics of river flow and structure, possible restrictions on bird movements, possible direct landtake, possible disturbance of waterfowl during construction; and
- Proposed incinerators at Runcorn and Ince Marches – possible air quality impacts through nitrogen and sulphur deposition.

Plans

- Liverpool City Region Renewable Energy Capacity Study – possible impacts on waterfowl flightpaths between the Mersey Estuary and other European sites depending upon the degree of wind power involved and the location of turbines;
- North West England & North Wales Shoreline Management Plan 2 – possible impacts due to the maintenance or enhancement of flood defences could lead to coastal squeeze, changes in sediment release (if previously undefended areas become defended) and direct loss of habitat to flood defence footprint;
- Core Strategies for Liverpool, Cheshire West and Chester, Knowsley, Sefton, Wirral and St Helens, the Mersey Heartlands Growth Point Programme of Delivery (Wirral and Liverpool) and Liverpool and Wirral Waters Development masterplans – possible water quality, air quality

and wildfowl disturbance impacts as a result of delivery of 110,000 dwellings and associated commercial development over the next 20 years; and

- Merseyside Joint Waste Development Plan Document – possible impacts due to water quality, air quality and wildfowl disturbance or chick predation. However, since this DPD is itself subject a recent HRA it will address its own contribution to any ‘in combination’ effect that may otherwise arise.

Appropriate Assessment

Disturbance of Qualifying Bird Species

Appropriate Assessment

- 5.17 HRA Screening identified pathways whereby policies within the Halton Core Strategy have the potential to result in direct disturbance to qualifying bird species of the Mersey Estuary SPA/Ramsar. These pathways are assessed in more detail below, including a discussion of any mitigation already built into the Core Strategy.
- 5.18 The Halton Core Strategy sets out (in the policy ‘Housing Supply & Locational Priorities’) proposals for the delivery of 8,000 new dwellings between 2010 and 2026. Although a number of the dwellings that will count towards this total already have planning permission, many have not yet come forward. The supporting text for this policy indicates that the population of the Borough will increase by approximately 5,000 people over the Core Strategy period (i.e. 4.2%). While a 4% increase in residents is small it cannot be considered in isolation but within the context of the approximately 110,000 dwellings to be delivered across Merseyside and Cheshire West/Chester and the fact that the Borough is likely to experience an aging population with increasing leisure time such that recreational pressure from the existing population may increase. As such, recreational disturbance impacts from Halton cannot be ruled out when considered in combination with the other Merseyside boroughs. Halton’s contribution to any effect may be smaller than that of some other boroughs although it does lie immediately adjacent to the Mersey Estuary which increases the likelihood that residents utilise accessible parts of the site.
- 5.19 Avoidance of adverse recreational impacts at European sites involves location of new development away from such sites (which is clearly not possible in Halton given that respondents to the England Leisure Day Visits³⁸ surveys typically travelled 25.5km to visit a coastal site for the day) or for the local authority in question (i.e. Halton MBC) to manage tourism and recreational use of the coastlines in conjunction with other relevant authorities. There thus needs to be an appropriate framework to manage recreation.
- 5.20 To achieve this, Halton Council needs to work with the other Merseyside Authorities, MEAS, Natural England, CCW and other partners to devise a framework for the delivery of:
- Suitably located Green Infrastructure where this will prove effective (the Mersey Waterfront Regional Park may well be a key element of this if it is accompanied by enhanced access management or wardening or provides additional greenspace landwards of the SPA). While this is unlikely to be effective (or viable) with regard to water-based recreation, it may be

³⁸ Various. 2006. England Leisure Visits: the Results of the 2005 Survey. Countryside Agency

possible and effective with regard to dog walking and other non-vehicular activities. Some species for which European sites have been designated are particularly sensitive to dogs, and many dog walkers may be happy to be diverted to other, less sensitive, sites. However the location and type of alternative space must be sufficiently safe and appealing to be effective; and

- Enhanced access management to the European sites when it becomes necessary, to be informed by the collation of visitor survey data. Examples of measures that may be deployable include temporary footpath/access closures during sensitive periods (e.g. the winter, when wintering birds are a key feature), rerouting of footpaths away from key hotspots for waterfowl, introducing enhanced wardening, introducing improved signage to encourage dogs to be kept on a lead or walked in areas that are away from key waterfowl hotspots or screening of key locations for recreational activity. With regard to the use of watercraft, on some sites this can be achieved through zoning of activities by site managers or the introduction of permitting systems limiting the amount of watercraft using the available space, although it is uncertain at this stage whether that would be feasible in the Mersey Estuary.

- 5.21 **Policy CS25** 'Green Infrastructure' states with regarding to protecting and enhancing the green infrastructure network in the Borough that '*Halton Borough Council working alongside other partners and agencies responsible for the delivery and maintenance of green infrastructure will achieve this through ... sustaining the protection afforded to internationally important sites for biodiversity by managing recreational impacts and encouraging the use of the wider green infrastructure network which is less sensitive to recreational pressure*'. This specifically places management of the GI network within the context of sustaining the protection of European sites by directing recreational activity to less sensitive areas. However, it is considered that some amendments would be desirable and these are discussed in the recommendations section.
- 5.22 The Mersey Gateway Project (**CS15**) and policies enhancing infrastructure development alongside the Estuary have the potential to adversely affect important bird viewlines, displace qualifying bird species, and cause cumulative disturbance to birds through an increase in noise, vibration and lighting. The Mersey Gateway Regeneration Strategy has been subject to its own HRA³⁹. This concluded that, due to the highly urbanised nature of the Mersey Gateway Regeneration area, the strategy would not impact upon the extent and distribution of bird viewlines. It was concluded that the Mersey Gateway Bridge would not provide any additional obstructions or provide roosting sites for predators such as raptors over what is currently available.
- 5.23 In addition, the supporting text for the Mersey Gateway Project policy states that: '*Although the design of the Mersey Gateway Bridge has been influenced by environmental considerations, the Mersey Gateway Project's Environmental Impact Assessment (EIA) process has identified localised negative environmental impacts particularly associated with the construction phase of the Mersey Gateway. Measures to satisfactorily mitigate negative environmental impacts and to enhance environmental quality should be taken. This will include environmental management techniques, compensation to offset effects and consideration of mitigation approaches during the construction phase. It should be acknowledged that the cumulative effects of the operational phase of the Mersey Gateway Project are mainly positive and include a range of permanent long term effects*'. This is reflected in the actual policy which states that '*Negative environmental*

³⁹ Halton Borough Council (May 2008) Mersey Gateway Regeneration Strategy Habitat Regulations Assessment
<http://www2.halton.gov.uk/pdfs/environment/spd/westbankspdhabitats>

impacts caused by the construction of the Mersey Gateway will be mitigated where appropriate, and opportunities to enhance the natural environment sought. This is particularly applicable to the Mersey Estuary area and other areas of significant environmental value'. While this includes specific reference to the Mersey Estuary it is currently considered that this policy would benefit from a more explicit wording. This is covered in our recommendations section, below.

- 5.24 In meeting the needs of gypsies, travellers and travelling show people (**Policy CS12**), HRA Screening identified a pathway for direct disturbance on the Mersey Estuary SPA/Ramsar depending on the location of allocated sites. This policy states that the Council will allocate appropriate sites to meet the accommodation needs of Gypsy, Travellers and Travelling Show people through a Site Allocations DPD. It also states that in allocating sites and for the purpose of considering planning applications relating to sites not identified in the Site Allocations DPD, it would need to be satisfied that the proposal is '*not unacceptably detrimental to the amenity or character of the surrounding area*'. While this could be taken to cover impacts on European sites it is general and non-specific. It is currently considered that this policy would benefit from a more explicit wording. This is covered in our recommendations section, below.
- 5.25 In identifying the requirement for mineral extraction (**Policy CS9**), HRA Screening identified a potential pathway of effect in changing landscape features resulting in the displacement of qualifying bird species within the SPA/Ramsar Boundary. **Policy CS9** states that minimising the need for minerals extraction is priority with all new developments expected to maximise the use of recycled and secondary aggregates by ensuring that any waste produced by development during construction and demolition is managed in accordance with the waste hierarchy; and the use of recycled/secondary aggregates is in accordance with the Joint Merseyside Waste DPD. Where mineral extraction does take place, the policy states it will be important to ensure that this is efficient and sustainable. To achieve this, proposals for mineral extraction in the Borough must meet criteria including that the development does not adversely impact upon Halton's communities, built or green environments and that the natural and historic environment is conserved, managed and enhanced. This policy will be supported by more detailed policy in relation to site specific requirements in the Development Management DPD. It is therefore considered that the Core Strategy contains necessary measures in place to ensure impacts on Natura 2000 sites are avoided. Further, more site-specific, mitigation would be developed in the Development Management DPD as required.
- 5.26 The Core Strategy promotes renewable and low carbon energy within Halton (**Policy CS18** – Sustainable Development & Climate Change). HRA Screening identified that, should this include wind turbine construction, a pathway exists for the construction of onshore/offshore turbines to disrupt flight paths and displace qualifying bird species. Disturbance issues associated with maintenance activities were also identified. The policy states that subject to successful assessment and mitigation of impacts of development proposals, Halton would seek to direct proposals for grid-connected renewable energy infrastructure and equipment, including, but not limited to: wind, solar PV and biomass CHP, to the identified priority zone areas. This policy is being informed by The Liverpool City Regional Renewable Energy Options⁴⁰ which identifies these priority zone areas for wind energy, none of which are located within the Borough of Halton. It is therefore unlikely that **Policy CS18** of the Halton Core Strategy will result in the development of wind turbines. As such it is considered that it will not lead to adverse effects on European sites.

40 Arup (2001) Liverpool City Regional Renewable Energy Options Stage 2 (Drawing Title CHP/DH & Wind Priority Zones, Final Issue) (date 27/5/2010)

5.27 The HRA Screening identified potential pathways of effects between The Liverpool John Lennon Airport (JLA) expansion (**Policy CS16**) and disturbance/displacement/collision of qualifying bird species due to increase in bird scaring devices and airplanes landing closer to the SPA/Ramsar designation area. A suite of ecological surveys has been undertaken in connection with this Master Plan on land within and adjacent to JLA and on areas required for expansion⁴¹. Aircraft currently take off or land over the mudflats adjacent to the Mersey Estuary SPA/Ramsar site. The flats are used by a proportion of the passage and wintering waterfowl for which the Estuary is of international importance which probably constitutes more than 1% of the total population in the estuary and any impact on them would therefore be significant. The assessment of the potential disturbance effect on both feeding and roosting waterfowl under the flight path was carried out as part of the regular wintering bird study to inform the John Lennon Liverpool Airport Masterplan⁴². The following was identified:

- the majority of waterfowl feeding on the shore at low water use the area between Garston and the western end of the runway. On most tides many of these birds remain to roost, moving up the shore in front of the tide. A relatively high level of disturbance to both feeding and roosting birds occurs here due to the use of the shore by walkers, dogs, quad bikes and four wheel drive vehicles, and at some times many of the birds are kept almost constantly on the move;
- no disturbance to the feeding birds due to aircraft was observed in any month except on abnormally high tides when roosting flocks are pushed right up to the toe of the cliff. At such times they are at their most susceptible to disturbance from all sources. During all other tide states, including more regular high tide heights, no disturbance effects from aircraft have been observed;
- most feeding birds move a relatively short distance along the shore before pitching again, but roosting birds may move directly to the cliff top and small flocks of waders have been observed feeding over the high tide period on remaining amenity grassland in the Liverpool International Business Park. Towards the end of winter 2005/06 small flocks of waders were observed on the new Coastal Reserve grassland areas. No birds moved (either off or along the shore by disturbance from any source) were observed passing through the flightpath of aircraft approaching or taking off from JLA;
- sporadic disturbance of roosting waterfowl by aircraft has been observed at the eastern (Hale) end of the survey area. Most waterfowl movements recorded are, again, of flocks travelling along the shoreline at all tide states, but occasional inshore movement has also been observed. This primarily consists of individuals and small flocks of curlews which feed on the farmland between Hale Heath and Rabbit Hey at all tide states, but more abundantly during the high tide periods;
- movements tend to be low and local, between the shore and adjacent land. No birds were seen to cross the airport flightpath during any survey visit, although single birds or small flocks of curlew have occasionally been recorded feeding on the fields north of Hale Heath.

⁴¹ John Lennon Liverpool Airport Masterplan November 2007
http://www.liverpoolairport.com/assets/_files/documents/oct_08/peel__1224146206_12_Master_Plan_Chapter_11.pdf

⁴² John Lennon Liverpool Airport Masterplan November 2007
http://www.liverpoolairport.com/assets/_files/documents/oct_08/peel__1224146206_12_Master_Plan_Chapter_11.pdf

Curlew is not a qualifying species for the SPA/Ramsar site, other than as part of the total assemblage, and at most, tens of birds have been recorded feeding in this area; and

- since the numbers involved were very small and birds disturbed at present appear to move the shortest possible distance, it was considered that there would be no significant impact to feeding or roosting birds using the shore adjacent to JLA, and thus no adverse effect on the integrity of the protected site. The proposed runway extension to 2,750 m would not encroach on the SSSI, SPA/Ramsar site.

5.28 The findings of the wintering bird study carried out to inform the John Lennon Liverpool Airport Masterplan suggest that the Liverpool John Lennon Airport (JLA) expansion (**Policy CS16**) within the Halton Core Strategy is unlikely to result in adverse effects on the integrity of the Mersey Estuary SPA/Ramsar through direct land take, or disturbance to feeding or roosting birds. However, it is not clear as to whether this conclusion has been accepted by Natural England and CCW. **Policy CS16** of the Halton Core Strategy does state that '*negative environmental and social issues associated with the operation and expansion of JLA should be satisfactorily addressed including measures to reduce or alleviate the impacts on the natural and built environment, including areas of international, national or local conservation, ecological and landscape value*'. However, it is considered that with regard to internationally important sites this should be strengthened since measures that merely 'reduce or alleviate' effects may not be sufficiently stringent to meet the requirements of the Habitats Directive.

Recommendation for amendments to policy

- 5.29 As a result of the assessment, we recommend the following amendments to policy.
- 5.30 To ensure direct disturbance to qualifying bird species as a result of **Policy CS12** Meeting the Needs of Gypsies, Traveller and Travelling Show People is avoided, additional text is proposed: '*sites that would lead to adverse effects on the integrity of the Mersey Estuary SPA/Ramsar site would not be taken forward*'.
- 5.31 To ensure that adverse significant effects on Natura 2000 sites are avoided, additional wording is recommended within Liverpool John Lennon Airport (JLA) expansion (**Policy CS16**). **Policy CS16** of the Halton Core Strategy currently states that negative environmental and social issues associated with the operation and expansion of JLA should be satisfactorily addressed including measures to reduce or alleviate the impacts on the natural environment, including locally, nationally and internationally important sites. We would recommend adding: '*With respect to internationally important sites such measures will need to be sufficiently extensive to enable a conclusion of no adverse effect on integrity unless it can be demonstrated that there are both no alternatives and Imperative Reasons of Over-riding Public Interest*'. This would make clear the high standards that would need to be achieved in order for mitigation to be deemed acceptable.
- 5.32 **Policy CS25** 'Green Infrastructure' states with regarding to protecting and enhancing the green infrastructure network in the Borough that '*Halton Borough Council working alongside other partners and agencies responsible for the delivery and maintenance of green infrastructure will achieve this through ... sustaining the protection afforded to internationally important sites for biodiversity by managing recreational impacts and encouraging the use of the wider green infrastructure network which is less sensitive to recreational pressure*'. This specifically places management of the GI network within the context of sustaining the protection of European sites

by directing recreational activity to less sensitive areas. However, it is considered that some amendments would be desirable.

- 5.33 Any strategy that follows on from this policy commitment will need to be sufficiently developed (or at least there will need to be a clear timescale for the introduction of such a strategy) by the time the Site Allocations DPD is adopted such that there is at least a funded mechanism to monitor recreational activity and trigger the introduction of enhanced management, since the delivery of enhanced access management and Green Infrastructure will need to be phased alongside delivery of housing. The contribution of each authority should be based upon their contribution to recreational activity in each site or (where this information is not yet available) their relative populations and proximity to the site. In general therefore the devising of such a strategy (whether it is part of a specific future SPD or not) will need to be well advanced by the time the Site Allocations DPD is adopted as some strategic greenspace and a possible contribution to funding access management may need to be associated with particular sites. It would be preferable for this to be mentioned in the Core Strategy policy or supporting text, or alternatively for the Core Strategy supporting text to cross-refer to this HRA report.
- 5.34 For the Mersey Estuary an appropriate detailed framework that encompasses the management of recreation may exist through a European Marine Site Management Scheme, which, if it follows the pattern of other EMS Management Schemes would include recreation/access management within its remit. If this does prove to be the case then the commitment given in the Green Infrastructure policy cited above could be explicitly linked to a commitment to support and participate (financially as required) this Management Scheme, in conjunction with the other Merseyside authorities and stakeholders.
- 5.35 If the above recommendations to manage access are implemented, it is concluded that there will be no adverse effect on the integrity of the Mersey Estuary SPA/Ramsar through direct disturbance as a result of any of the policies proposed within the Core Strategy.

Loss of Supporting Habitat and Coastal Squeeze

Appropriate Assessment

- 5.36 HRA Screening identified the potential for development arising from the Core Strategy (on land either immediately adjacent to the Mersey SPA/Ramsar designation or elsewhere in the Borough) to result in loss of supporting semi natural habitat. The loss of such supporting habitat may affect qualifying bird species e.g. wading birds can roost and seek shelter on former industrial land inland from the Mersey Estuary.
- 5.37 Work has been undertaken to establish the location of such important supporting habitat sites for qualifying bird species within Merseyside⁴³. This included an assessment of sites both within and adjacent to the SPA/Ramsar designation. It has been established that The Weaver Bend (south west Runcorn) support nationally important numbers of roosting European Golden Plover and locally important numbers of feeding Dunlin. Additionally Hale and its associated mudflats and sand bars have been identified the most important site surveyed on the north shore of the Mersey. Locally important numbers of feeding, roosting and loafing Common Shelduck and Dunlin were recorded at this site. Furthermore limited evidence from ad hoc sources suggests land at Ditton, and possibly at Shell Green also serve as supporting habitat can perform this

⁴³ RSK (2010) Mersey Feasibility Study Winter Bird Report

function⁴⁴. Hale and its surrounding land is identified as greenbelt within the Halton Core Strategy. This includes a presumption against development of this area.

- 5.38 Policy **CS9** (West Runcorn) identifies West Runcorn as a 'key area of change' and seeks to focus major residential and industrial development in this area. Both Runcorn Docks and Western Docks (Mersey Gateway Port) are identified for development. It is therefore considered a legitimate concern that waterside development could result in loss of supporting habitat (e.g. brownfield/post industrial land) at Weaver Bend. Furthermore Ditton is identified as a 'Neighbourhood Priority Area'. Loss of land around Ditton may also result in a loss of supporting habitat. It is likely that additional such areas exist within the Borough. The Core Strategy states that a Site Allocations DPD will have an important role in determining which of the West Runcorn Sites are used for particular purposes. At the moment the Core Strategy does not explicitly address the issue of loss of supporting habitat.

Recommendations for amendment to policy

- 5.39 In view of the potential for loss of supporting habitat and coastal squeeze as a result of the Core Strategy, the following recommendations are made:

- Development of Runcorn and Western Docks (**Policy CS9**) would be subject to a suitable assessment and appropriate mitigation to ensure any loss of supporting habitat does not result in significant adverse effects on the integrity of qualifying bird species. This should be reflected in policy wording. If supporting habitat were to be lost to any development, then the applicant would need to determine (a) how significant it was (i.e. whether it was used by more than 1% of the population of qualifying bird species and (b) to provide alternative habitat to replace it in an location that was reasonably close to the Estuary; and
- The development of the site allocation DPD would include the identification of areas outside of the SPA/Ramsar designation that serve as important supporting habitat for qualifying bird species. The Site Allocation DPD should include appropriate mechanisms in place to ensure the loss of such sites is adequately assessed and mitigated.

- 5.40 The Core Strategy should also prevent any development being delivered in areas that may exacerbate coastal squeeze. The Core Strategy should:

- Ensure that new development is not delivered in locations which would require a change in coastal defence policy that might compromise natural coastal processes (e.g. from No Active Intervention to Hold the Line or Advance the Line); and
- Prevent development being delivered in areas that may compromise locations identified for managed retreat as set out in the Environment Agency Coastal Habitats Management Plan (CHaMP) and Regional Habitat Creation Programme.

⁴⁴Halton Borough Council (July 2007) Provision of Open Space SPD Habitat Regulations Assessment (Appropriate Assessment Stage) <http://councillors.halton.gov.uk/Published/C00000292/M00002968/AI00005602/AppendixDOpenSpaceSPDfinalHRAAA.pdf>

Deterioration in Water Quality

Appropriate Assessment

- 5.41 HRA Screening identified policies within the Halton Core Strategy that have potential pathways of impacts relating to the water quality of the Mersey Estuary SPA/Ramsar. These relate to three areas which are discussed in turn below:
- waste water discharge (domestic and industrial);
 - shipping and dredging; and
 - water abstraction (industrial).
- 5.42 Table 5⁴⁵ summarises the water quality issues being experienced at the Mersey SPA/Ramsar site, along with the likely causes and features of interest at risk of being adversely affected.
- 5.43 The Halton Core Strategy, through the provision of housing, employment and other mixed-use development (and associated waste water discharge) has the potential to result in a deterioration of water quality in the Mersey Estuary SPA/Ramsar.
- 5.44 A study carried out in 1999⁴⁶ serves as a useful indication of the location and size of waste water treatment work inputs to the Mersey Estuary. Whilst slightly dated now this study illustrates the extent of water quality pressures on the Mersey within the context of other similar sites in the UK. The study show major trade and sewage effluent to be discharged throughout the Mersey Estuary with significant inputs including from Widnes, Runcorn within Halton. Estimated inputs from trade effluent at that time (~650,000 m³/day) represent just over half the amount of sewage effluent (~1,200,00 m³/day). This is significantly greater than the neighbouring Dee Estuary which had estimated trade effluents at ~50,000 m³/day and sewage effluents at ~62,000 m³/day. There are few other European Marine Sites which have such a high level of discharge, only the Thames and Solent in Southampton. No data on contaminants in discharges is currently available. Water quality issues are clearly a major vulnerability currently being experienced by Mersey Estuary SPA/Ramsar. It should be noted that since this study the Mersey basin clean-up campaign has improved this baseline (described in greater detail below).
- 5.45 The Environment Agency is understood to have conducted its own review of sources in relation to the requirements of HRA. According to Langston *et al*⁴⁷ following a review of the Environment Agency Review of Consents for 3,886 permitted water discharges, all of these were 'screened in' as part of the Stage 1 HRA, and of these 919 were taken through from Stage 2 to Stage 3 Appropriate Assessment. This included:
- those discharges responsible for discharging the top 90% of the nutrient/BOD/ammonia load entering the Mersey Estuary;
 - those discharges discharging directly into the Mersey Estuary;

⁴⁵ Langston, W.J., Chesman, B.S. and Burt, G.R. (2006). (The Marine Biological Association (2006)) *Characterisation of European Marine Site: the Mersey Estuary Special Protection Area*, Marine Biological Association Occasional Publication No18.

⁴⁶ Allen, Y. T., Hurrell, V., Reed J., and Mathiessen P. (2000) Endocrine Disruptors and European Marine Sites in England. Centre for Environment Fisheries and Aquaculture Science (CEFAS). Contract C01042 for English Nature. 159pp

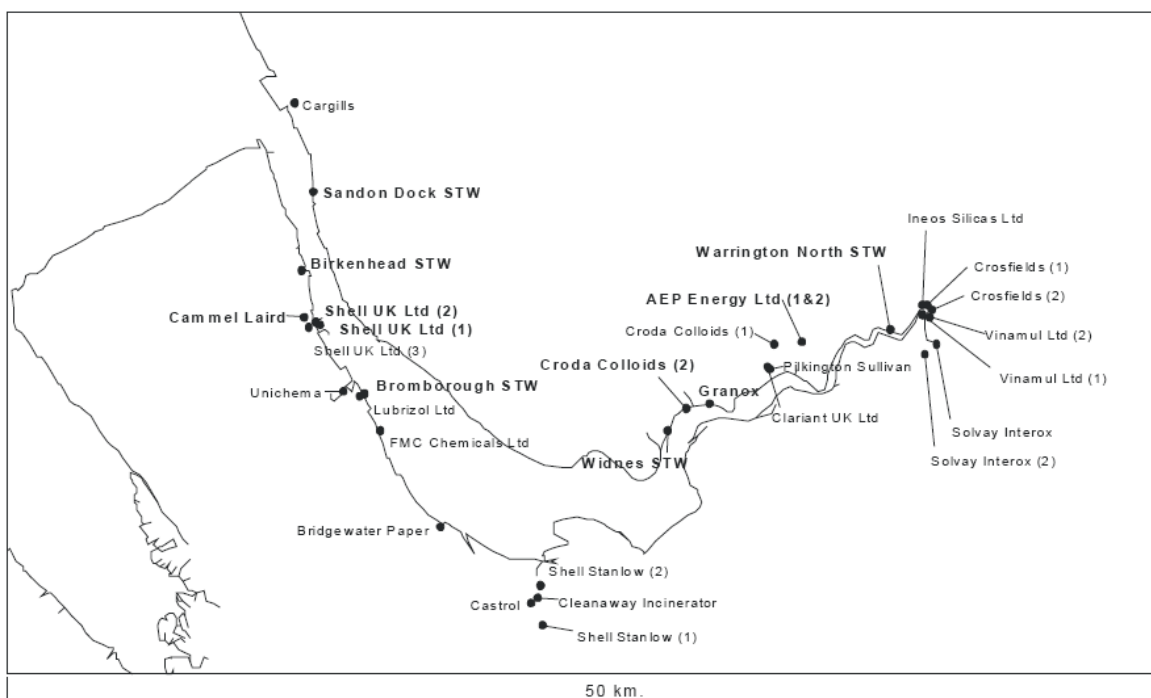
- those discharges authorised to discharge a List 1 and/or List 2 Dangerous substance that has been found to be either exceeding or at risk of exceeding the Environmental Quality Standard in the Mersey Estuary;
- all IPC/IPPPC water discharges not already considered under the Directive.

5.46 Of the 919 discharges requiring an AA only around 380 are continuous discharges. The remainder largely represent intermittent discharges (storm sewage overflows / emergency discharges from pumping stations). Figure 5 indicates the Environment Agency priority outfalls of the Mersey⁴⁸. It is noted that three priority outfalls are located in Halton (Runcorn) with others located in Liverpool, Wirral and Warrington.

5.47 It should be noted that the Mersey Basin clean-up campaign has produced substantial improvements over the last 25 years. The Mersey is now reported to support a wide range of fish species, including migratory fish, and there has been an increase in numbers of other animals returning to the estuary including reported sightings of porpoises, grey seals and octopus. Langston *et al*⁴⁹ conclude that in the absence of specific information on individual discharges, there is insufficient evidence to justify further expensive remedial action on particular sources. However, there is sufficient uncertainty to justify a more targeted and detailed programme of research and surveillance to measure actual biological impacts at a variety of levels (e.g. biochemistry, bioaccumulation, biomarkers and community structure) at sites within the European Marine Sites and near priority discharges. If results indicate deleterious effects, which can be attributed to known causes then the case for remedial action against key sources (which may include multiple inputs) would be placed on a stronger scientifically sound basis. At the very least such a program would provide a benchmark for assessing future changes in the condition of the site and likely contributions from water quality.

⁴⁸ Langston, W.J., Chesman, B.S. and Burt, G.R. (2006). (The Marine Biological Association (2006)) *Characterisation of European Marine Site: the Mersey Estuary Special Protection Area*, Marine Biological Association Occasional Publication No18.

⁴⁹ Langston, W.J., Chesman, B.S. and Burt, G.R. (2006). (The Marine Biological Association (2006)) *Characterisation of European Marine Site: the Mersey Estuary Special Protection Area*, Marine Biological Association Occasional Publication No18.



5.48 These studies illustrate that combined pollution pressure from run off and waste water discharges throughout the Mersey catchment (including the upper reaches outside of Merseyside) has been a significant historic pressure. Whilst this situation has improved significantly, the potential still exists for surface water run off and waste discharges to adversely affect the qualifying features of the Mersey SPA/Ramsar. It would be disproportionate to suggest Halton Core Strategy has the potential to significantly deteriorate the water quality of the Mersey Estuary above the existing baseline. However it is reasonable to identify the potential for an *in-combination* effect of the Halton Core Strategy (above the existing baseline) on the water quality pressures. The policies within the Core Strategy, in particular, include policies for the waterfront revitalisation at of South Widnes town centre (CS4, CS7) the development of Runcorn and Western Docks (CS9) and the Mersey Gateway Project (CS14). Other policies that are likely to contribute equally to this in-combination effect are those contained within the Liverpool, Wirral and Warrington Core Strategies.

Recommendations for amendment to policy

5.49 It should be noted that the majority of the processes that could result in a deterioration of water quality (waste water discharges, surface water runoff and pollution from construction activities) are either regulated through statutory requirements or can be mitigated through standard construction techniques and environmental good practice. These impacts are therefore unlikely. Furthermore it should be noted that policy CS23 (Managing Pollution and Risk) states that ‘Development proposals should not exacerbate and where possible should minimise all forms of emissions and ... water ... pollution’.

5.50 Avoiding an adverse effect is largely in the hands of the water companies (through their investment in future sewage treatment infrastructure) and Environment Agency (through their role in consenting effluent discharges). However, local authorities can also contribute through

ensuring that sufficient wastewater treatment infrastructure is in place prior to development being delivered through the Core Strategy. In the case of Halton, this is alluded to in the supporting text for **Policy CS15** (Infrastructure Provision): “An integral part of the Core Strategy is to ensure that development proposals are supported by the timely provision of an appropriate level of infrastructure including... physical and environmental infrastructure such as water supply and treatment”.

- 5.51 However, it is considered that this allusion needs to be slightly expanded upon in order to provide a firm commitment with regard to the linking of housing delivery to delivery of necessary infrastructure that will ensure that an adverse effect on European sites is avoided. Ideally, the supporting text for the Core Strategy should make specific reference to the fact that the delivery of development will be phased in order to ensure that it only takes place once any new water treatment infrastructure or appropriate retro-fitted technology (e.g. phosphorus stripping) necessary to service the development while avoiding an adverse effect on European sites is in place. The Core Strategy should also indicate how this need will be determined and delivered through interaction with other authorities (United Utilities, the Environment Agency etc) i.e. through a Water Cycle Strategy.
- 5.52 It is concluded that, with the recommended addition to the supporting text for policy **CS15** (Infrastructure Provision), the Halton Core Strategy is unlikely to result in significant adverse impacts on qualifying features of the Mersey Estuary SPA/Ramsar through waste water discharge.

Dock, Port and Channel Construction, Maintenance Shipping and Dredging

Appropriate Assessment

- 5.53 HRA Screening identified policies encouraging dock and port development, and greater use of freight by shipping within the Halton Core Strategy to have the potential to result in a deterioration of water quality of the Mersey Estuary SPA/Ramsar site. Development of ports and docks has the potential to disturb substrates/ circulate synthetic chemical pollutants and heavy metals all of which could result in potential harm to benthic communities, aquatic invertebrates and habitats required by qualifying bird species. Furthermore greater shipping freight has the potential for pollution through fuel emissions/ accidental spillage (described above in relation to waste water discharge/run-off above).
- 5.54 These risks are highlighted by a study for Natural England⁵⁰. The level of Tributyltin (TBT) in tidal waters exceeds the Environmental Quality Standard (EQS) at most sites, sometimes by a considerable margin. Sources include the Manchester Ship Canal, docks and shipyards, and the river Mersey itself: highest levels were at Monks Hall at the head of the tidal waterway. Sediments in docks contain hotspots which are above action limits (for safe disposal). Additionally, heavy metal distribution, along with PAHs, PCBs and DDT residues from historical inputs, were identified as significant. Enhanced loadings sometimes appear in subsurface layers in sediment cores. Dredging has been identified as a key activity that could re-expose these layers making them and their associated contaminant burdens available to organisms. Redistribution of these sediments was identified as a significant threat to the condition of the site. Further investigation on sources, trends and impacts was recommended including further bio

⁵⁰ Langston, W.J., Chesman, B.S. and Burt, G.R. (2006). (The Marine Biological Association (2006)) *Characterisation of European Marine Site: the Mersey Estuary Special Protection Area*, Marine Biological Association Occasional Publication No18.

monitoring of sediments (bioaccumulation and effects) and the possibility of transfer of contaminants through dietary organisms to bird populations of the SPA.

- 5.55 With regards to greater shipping freight in the Mersey and the potential for pollutions through fuel emissions/accidental spillages, it should be noted that oil pollution is a continual threat to all inshore marine habitats, and is particularly pronounced in the Mersey Estuary due to its enclosed and sheltered nature. Risks include small leaks, spills and discharges, as well as the possibility of a major accident. There are a number of ways in which oil could potentially impact on the interest features of the SPA/Ramsar including intertidal habitats, shellfish beds, benthic communities, *Zostera* plants, Eggs and planktonic larval stages of fish, molluscs and crustacean.
- 5.56 Studies have found total hydrocarbon concentrations (THC) in the Mersey to be amongst the most elevated in the UK⁵¹. In the mouths of the estuaries sampled (including Liverpool Bay for the Mersey), highest THC levels occurred at low tide, reflecting respective dominant flows of more highly contaminated water from upstream. A variety of sources were suggested including industrial discharges and spillages from shipping and land-based sources (including river-borne discharges, road runoff) and atmospheric discharges.
- 5.57 Based on this evidence it is clear that policies contained within the Core Strategy which encourage the development of docks and ports within the Mersey, and/or result in greater ship movements (either larger ships or new shipping routes which may require navigational dredging, or a greater number of ships creating more ship wash and erosion) have the potential to result in significant impacts on qualifying features of Mersey Estuary SPA/Ramsar.

Recommendations for amendment to policy

- 5.58 It is clear that there a number of activities relating from the development of ports, docks, channel construction and greater number of ships as result of above, that is likely to require differing mitigation. The Core Strategy is able to set the framework for these, but the details of specific measures would require further development at a project level, particularly since this will include authorities other than Halton. Broadly, mitigation that could be designed into the design and management of new dock/port development may include⁵²
- environmental policy, reviews and management systems,
 - information and codes of conduct,
 - ensuring safety,
 - emergency response procedures,
 - provision of information on SACs,
 - zoning of activities,
 - re-routing via alternative navigation channels,

⁵¹ Kirby et al (1998) in English Nature, Plymouth Marine Partnership, The Marine Biological Association (2006) *Characterisation of European Marine Site: the Mersey Estuary Special Protection Area*, Marine Biological Association Occasional Publication No18.

⁵² http://www.ukmarinesac.org.uk/activities/ports/ph3_3_1.htm

- protection of intertidal features from ships wash using breakwaters and other structures,
- compliance with regulations covering cargo operations and promotion of good practice, and
- managing anchoring.

- 5.59 Where there is evidence that ship or boat wash is causing erosion of designated intertidal flats or saltmarsh habitat, and where other appropriate measures have been considered and applied, a further management option that may be considered is to protect the intertidal features by creating structures, such as breakwaters, bunds or mounds of sediments on the intertidal. Harwich Harbour Authority has applied this approach in Trimley Marshes on the Stour/Orwell Estuary⁵³. Such an approach to protecting marine features may also provide a beneficial use for dredged materials, however the potential impacts on local hydrodynamics and ecology, should be considered. This should not be considered where the costs of undertaking such a scheme would greatly outweigh the potential environmental gain. Furthermore, the potential application of this approach may be limited by the need for a grant aid to fund this work and by land ownership issues.
- 5.60 A further method of minimising ships' wash in the proximity of vulnerable shores might be to place moorings in the area to reduce speeds. This is a particularly useful approach where small speedboats and personal watercraft are a potential problem. Other variables which influence ships' wash, such as propeller wake, ship design and hull form, are outside the scope and powers of any port authority.
- 5.61 It should be noted that **Policy CS22** (Managing Pollution and Risk) already makes provision to ensure risk levels from existing installations or facilities with the potential to create major accidents are recognised and that development proposals for new or expanded installations that increase risk levels do not take place on such sites. The same policy also seeks to ensure that development does not result in unacceptable levels of pollution (including air, odour, water, ground, noise and light) through its location, design, construction and operation. Additionally **policy CS6** (3MG) makes particular regards to respecting the Mersey Estuary SPA/Ramsar. It can therefore be demonstrated that the Core Strategy already includes inherent mitigation to avoid these potentially significant effects on the Mersey Estuary SPA/Ramsar.
- 5.62 However it is considered that a greater commitment to this is required in the Core Strategy to ensure the development of Docks and Ports within the Mersey Estuary, and any associated channel construction or dredging activity will be permitted subject only to the completion of a project based Appropriate Assessment. Such an Appropriate Assessment would include a thorough consideration of impacts relating to construction (including potential disturbance of sediments and hydrodynamic modelling if required), operational impacts (including anticipated changes in boat traffic and associated impacts) with necessary mitigation in construction, design and management. This particularly applicable to policies **CS7** (South Widnes); **CS9** (West Runcorn) and Mersey Gateway Port (3MG Western Docks) to be developed as a multimodal facility using Manchester Ship canal (**CS6**).

⁵³ http://www.ukmarinesac.org.uk/activities/ports/ph3_3_1.htm

Deteriorating Air Quality

Appropriate Assessment

- 5.63 The Core Strategy identifies policies that have the potential to contribute to a rise in atmospheric nitrogen deposition in the Mersey Estuary SPA/Ramsar. This includes policies that:
- may result in an increase car use notably as a consequence of housing and business development, particularly within 200m of the Mersey Estuary (e.g. **CS7, CS9**);
 - promote greater cross Mersey travel (e.g. The Mersey Gateway Project **CS15**);
 - air travel (Liverpool John Lennon Airport **CS16**);
 - CHP (Renewable and Low Carbon Energy **CS18**) (currently being informed by The Liverpool City Regional Renewable Energy Options⁵⁴ which two District Heating Priority Areas within Halton); and
 - policies promoting greater shipping (**CS9**) has the potential to result in a rise in atmospheric sulphur deposition.
- 5.64 Some of these policies do include qualifying statements (i.e. subject to successful assessment and mitigation of impacts) to avoid significant impacts on the Mersey Estuary SPA/Ramsar.
- 5.65 With regards to air quality impacts relating to atmospheric sulphur deposition, these will relate largely to shipping and airport expansion. Reference to APIS⁵⁵ indicates that 41% of sulphur currently deposited in the SPA arises from 'other transport' (i.e. not road or shipping), which in this case is likely to essentially be air traffic. This compares to only 3% derived from shipping. However, the Site Relevant Critical Load for each bird for which the SPA was designated also seems to indicate that they are not considered likely to be affected by high sulphur deposition. Therefore no further mitigation is required at policy level with respect to sulphur deposition from air transport with regard to the interest features of the SPA.
- 5.66 With regards to eutrophication as a result of atmospheric nitrogen deposition, one might expect similar pressures to arise described in the water quality section above. However, the Site Relevant Critical Load on APIS for nitrogen deposition as it relates to each bird for which the SPA was designated indicates that actual nitrogen deposition is on 11.9 kgN/ha/yr compared to a critical load (for littoral sediment) of 20-30 kgN/ha/yr. It is therefore highly unlikely that increases in traffic would result in the enormous increases in deposition which would be required to exceed the critical load, given that road transport is currently only responsible for 7% of nitrogen deposition in the SPA. It should also be noted that APIS concludes the effects may be positive for many birds because nitrogen enrichment potentially means more prey species.
- 5.67 Based on this information it is concluded that the Halton Core Strategy is unlikely to result in significant adverse effects on the integrity of the Mersey Estuary SPA/Ramsar due to a deterioration in air quality. Therefore no mitigation is recommended.

⁵⁴ Arup (2001) Liverpool City Regional Renewable Energy Options Stage 2 (Drawing Title CHP/DH & Wind Priority Zones, Final Issue) (date 27/5/2010)

⁵⁵ Air Pollution Information System <http://www.apis.ac.uk/>

Conclusion

- 5.68 The Appropriate Assessment has concluded that with the incorporation of the measures listed above, the draft publication Halton Core Strategy would include an adequate policy framework to enable the delivery of measures to avoid or adequately mitigate an adverse effect on the integrity of the Mersey Estuary SPA/Ramsar site.

6 Mersey Narrows & North Wirral Foreshore pSPA / pRamsar site

Introduction

- 6.1 The Mersey Narrows and North Wirral Foreshore pSPA and pRamsar site is approximately 2,078ha, located at the mouths of the Mersey and Dee estuaries. The site comprises intertidal habitats at Egremont foreshore (feeding habitat for waders at low tide), man-made lagoons at Seaforth Nature Reserve (high tide roost and nesting site for terns) and the extensive intertidal flats at North Wirral Foreshore (supports large numbers of feeding waders at low tide and also includes important high-tide roost sites). The most notable feature of the site is the exceptionally high density of wintering Turnstone. The Mersey Narrows and North Wirral Foreshore has clear links in terms of bird movements with the nearby Dee Estuary SPA and Ramsar site, Ribble and Alt Estuaries SPA and Ramsar site, and (to a lesser extent) the Mersey Estuary SPA and Ramsar site (Wirral MBC, 2001).

Reasons for Designation

- 6.2 The Mersey Narrows and North Wirral Foreshore pSPA and pRamsar site is proposed on the grounds of its feeding and roosting habitat for non-breeding wading birds, and as a breeding site for terns (Wirral MBC, 2001). The Birds Directive Annex I species (qualifying the site under Article 4.1), which can be found in any season, are:
- Common Tern *Sterna hirundo*: 124 pairs breeding = 1.0% of the GB population; and
 - Bar-tailed Godwit *Limosa lapponica*: 537 individuals wintering = 1.0% of the GB population.
- 6.3 The site also qualifies under Article 4.2 of the Birds Directive, as it is used regularly by 1% or more of the biogeographical populations of the following migratory species:
- Knot *Calidris canutus*: 10,661 individuals = 3.0% of NW European, NE Canadian, Greenland & Icelandic populations;
 - Redshank *Tringa totanus*: 1,606 individuals = 1.1% Eastern Atlantic population; and
 - Turnstone *Arenaria interpres*: 1,593, individuals = 2.3% Western Palearctic population.
- 6.4 Additionally, in qualifying under Article 4.2 of the Birds Directive, the site regularly supports over 20,000 individuals of a wider range of species, including dunlin, knot *Calidris canutus*, grey plover *Pluvialis squatarola*, oystercatcher *Haematopus ostralegus* and cormorant *Phalacrocorax carbo*.
- 6.5 The site qualifies under the Ramsar Convention under Criterion 5, regularly supporting over 20,000 waterbirds (non-breeding season, 28,841 individual waterbirds), and Criterion 6, regularly supporting 1% of the species or subspecies of waterbird in any season listed above.

Historic Trends and Current Pressures

- 6.6 Due to its location at the mouth of the Mersey Estuary and in the Liverpool Bay, this site has been subject to the same changes as described for the Mersey Estuary SPA and Ramsar site, in particular water quality improvements since the 1960s (especially since 1985), and increases in agricultural effluent pollution during this same period.
- 6.7 Some of the main current (as opposed to future) environmental pressures relevant to the nature conservation objectives of the Mersey Narrows and North Wirral Foreshore pSPA / pRamsar site are:
- disturbance of sediment releasing legacy heavy metal pollution (lead, cadmium, arsenic and other poisons) that is bound into the sediment;
 - pollution via rivers and drains by both treated sewerage and untreated runoff containing inorganic chemicals and organic compounds from everyday domestic products, which 'may combine together in ways that make it difficult to predict their ultimate effect of the marine environment... Some may remain indefinitely in the seawater, the seabed, or the flesh, fat and oil of sea creatures';
 - pollution via commercial shipping by chemical or noise pollution and the dumping of litter at sea;
 - damage of marine benthic habitat directly from fishing methods;
 - damage of marine benthic habitat along the North Wirral Foreshore directly or indirectly from aggregate extraction, particularly anywhere that dredging may be altering erosion/deposition patterns;
 - 'coastal squeeze' (a type of coastal habitat loss) from land reclamation and coastal flood defences and drainage used in order to farm or develop coastal land, and from sea level rise;
 - loss or damage of marine benthic habitat directly and indirectly (through changed sedimentation/deposition patterns) as a result of navigational dredging in order to accommodate large vessels – e.g. into the ports of Liverpool;
 - harm to wildlife (especially birds) or habitat loss due to increasing proposals/demand for offshore wind turbines; and
 - pollution, direct kills, litter, disturbance or loss of habitat as a result of water-based recreation or other recreation activity and related development along the foreshore (Wildlife Trust, 2006);
 - introduction of non-native species and translocation; and
 - selective removal of species (e.g. bait digging, wildfowl, fishing) (Wildlife Trust, 2006 and Marine Biological Association, 2006).
- 6.8 The Mersey Estuary does have a high load of nutrients mainly from diffuse sources, with levels for phosphate and nitrogen decreasing from point sources. However, recent modelling has shown that due to the natural turbidity of the water, there is only a low risk of excessive algal growth. Given the close hydrological linkage between the Mersey Estuary and the North Wirral Foreshore, this is likely to hold true for this pSPA/pRamsar site.

Key potential pressures from Halton

- 6.9 From the environmental requirements that have been identified above it can be determined that the following impacts of development could interfere with the above environmental requirements and processes on the pSPA and pRamsar:
- water quality from one or more of the following pathways to the River Mersey: discharge of treated sewage effluent into the Mersey; potential water pollution incidents arising from construction of Mersey Gateway Bridge/Mersey Gateway Port development (Runcorn), untreated runoff containing inorganic and organic compounds;
 - water quality from increase in commercial shipping resulting from development of Mersey Gateway Port (Runcorn);
 - loss or damage of marine benthic habitat directly and indirectly (through changed sedimentation/deposition patterns) as a result of navigational dredging in order to accommodate large vessels – e.g. into Mersey Gateway Port; and
 - pollution, direct kills, litter, disturbance or loss of habitat as a result of water-based recreation or other recreation activity.
- 6.10 Local air quality issues arising from the Core Strategy are scoped out of consideration since the site is physically separated from Halton.

Role of other plans and projects

- 6.11 In addition, the following plans and projects are considered to have the potential to act upon the pSPA/pRamsar site 'in combination':

Projects

- Peel Ports 'Super Port' – potential impacts due to increased sulphur deposition from shipping, physical disturbance of habitat, mobilisation of contamination, possible disturbance of waterfowl from noise and shipping activity;
- Liverpool John Lennon Airport expansion – potential impacts due to increased sulphur and nitrogen deposition from aircraft, loss of supporting foraging/high-tide roost habitat and possible disturbance of waterfowl from noise;
- Proposed incinerators at Runcorn and Ince Marches – possible air quality impacts through nitrogen and sulphur deposition; and
- Frodsham Windfarm - possible impacts on waterfowl flightpaths between the North Wirral Foreshore and other European sites.

Plans

- Liverpool City Region Renewable Energy Capacity Study – possible impacts on waterfowl flightpaths between the Mersey Estuary and other European sites depending upon the degree of wind power involved and the location of turbines;
- North West England & North Wales Shoreline Management Plan 2 – possible impacts due to the maintenance or enhancement of flood defences could lead to coastal squeeze, changes in

sediment release (if previously undefended areas become defended) and direct loss of habitat to flood defence footprint;

- Core Strategies for Flintshire, Denbighshire, Liverpool, Cheshire West and Chester, Knowsley, Sefton, Wirral and St Helens, the Mersey Heartlands Growth Point Programme of Delivery (Wirral and Liverpool) and Liverpool and Wirral Waters Development masterplans – possible water quality, air quality and wildfowl disturbance impacts as a result of delivery of over 110,000 dwellings and associated commercial development over the next 20 years; and
- Merseyside Joint Waste Development Plan Document – possible impacts due to water quality, air quality and wildfowl disturbance or chick predation. However, since this DPD is itself subject a recent HRA it will address its own contribution to any ‘in combination’ effect that may otherwise arise.

Appropriate Assessment

Water Quality Deterioration

Appropriate Assessment

- 6.12 The Mersey Narrows and North Wirral Foreshore pSPA/pRamsar includes the mouth of the Mersey Estuary (principally Egremont Foreshore on the south bank, and Seaforth on the north bank) as well as the North Wirral Foreshore itself. Egremont Foreshore and Seaforth are separated by approximately 2km, but are considered to be an integral site on the basis of the constant interchange of bird populations. These areas of the Mersey Narrows and North Wirral Foreshore pSPA/pRamsar are susceptible to changes in water quality in the Mersey Estuary arising from:
- wastewater discharge (domestic and industrial); and
 - shipping and dredging.
- 6.13 Chapter 4 has already provided an Appropriate Assessment of these identified pathways from the Halton Core Strategy to the Mersey Estuary. These potential adverse effects would also be relevant to Mersey Narrows and North Wirral Foreshore pSPA/pRamsar site (particularly Egremont Foreshore and Seaforth nature reserve at its mouth) due to the hydraulic connections along the Mersey Estuary.
- 6.14 A recent study has been undertaken to establish the ecological value and functionality of key points along the Mersey Estuary, which included these two sites within the Mersey Narrows⁵⁶ described below.
- 6.15 The area around Seaforth Nature reserve was identified as particularly important as a high tide roost site, particularly during high spring tides when rocky shores and man-made structures closer to the feeding areas are submerged and not available as roosting sites. Important for wildfowl and some wading bird species. The Marine Lakes is a sheltered roosting location that regularly supported a diverse assemblage of mixed duck species; notably diving ducks. Numbers of dabbling ducks; Eurasian Teal and to a lesser extent Common Shelduck were high in

⁵⁶ RSK (2010) Mersey Feasibility Study Winter Bird Report

comparison to other sites surveyed but again these records were mostly of birds on the Seaforth site. The site is adjacent to the Seaforth LNR and most of the wading species recorded at Crosby were of birds on this site. Black-tailed Godwits regularly used this site but were recorded almost exclusively on the Seaforth site. The foreshore areas were used by feeding shorebirds including locally significant numbers of Eurasian Oystercatcher, Sanderling and Ringed Plover. The foreshore areas at Crosby were subject to the greatest level of activity of Eurasian Oystercatcher of all sites surveyed. These birds transferred regularly with the site at New Brighton. The exposed sandy beaches were used regularly by this species as a feeding site with birds roosting near the Marine Lakes or on the Seaforth site. Bar-tailed Godwits were recorded sporadically at this site.

- 6.16 The North Wirral Foreshore and New Brighton area (around Egremont Foreshore) are widely recognised as being of conservation importance for many species of wading bird, particularly feeding at low tide on the barnacle beds and groynes. The foreshore area consists of large expanses of exposed sandy beach at low tide and it is in these areas that the highest activity of Eurasian Oystercatcher were recorded. This species occurred in locally significant numbers roosting on the breakwaters and surrounding structures at high tide. There is a high transference of birds between Egremont Foreshore and Crosby. This site is well known as a regular wintering site for Purple Sandpipers. These birds used the rocky areas, groynes and shore defences for both feeding and roosting and were closely associated with larger flocks (several thousands) of Ruddy Turnstone which also congregate on the Marine Lake area as a high tide roost; as well as feeding on the tide line. Eurasian Oystercatchers were also noted using the high tide roost on the Marine Lake as this area was relatively undisturbed.
- 6.17 It is therefore possible that any changes in water quality and resultant effects on crustaceans, worms or other food source, has the potential to affect these qualifying bird species within the Egremont Foreshore and Seaforth Nature Reserve areas. It should be noted, however that any deterioration in water quality arising from Halton Core Strategy, particularly when considered *in combination* with the Liverpool and Wirral Core Strategies within Merseyside, as well as the Warrington Core Strategy in Cheshire.

Recommendations for amendment to policy

- 6.18 The recommendations given in Chapter 4 for addressing water quality and dredging/port development related impacts with regard to the Mersey Estuary SPA/Ramsar site would also serve for Mersey Narrows & North Wirral Foreshore pSPA/pRamsar site.
- 6.19 The potential for direct disturbance from shipping on qualifying bird species is described below.

Disturbance

Appropriate Assessment

- 6.20 Several online sources^{57 58} suggest that the North Wirral Foreshore is both easily accessible and well used by dog walkers. These sources also suggest water based recreation (e.g. jet skies) to

⁵⁷ <http://friendsofnorthwirralcoastalpark.co.uk/>

⁵⁸ <http://www.wirralglobe.co.uk/news/1732173.0/>

be potentially damaging. Additionally, the North Wirral Foreshore is used for bait digging⁵⁹. Recreational pressures highlighted in HRA Screening are therefore a legitimate concern.

- 6.21 General increased housing development within Halton, coupled with policies seeking to enhance connectivity and accessibility between Halton and other Merseyside Boroughs has the potential to increase the existing recreational pressures on Mersey Narrows and North Wirral Foreshore pSPA/pRamsar site. These policies include the provision of infrastructure (CS5) including transport infrastructure (roads, railways, public transport, walking, cycle routes (including sustainable transport (CS14)) and Mersey Gateway Project construction to improve cross-river sustainable transport opportunities (CS15). From a sustainability perspective, such policies are beneficial and it would be inappropriate for the Core Strategy to reduce connectivity and accessibility between the Merseyside Boroughs in an attempt to reduce visitors to these sites.
- 6.22 However, the North Wirral Foreshore is approximately 30km from the nearest urban areas of Halton by road. Even the delivery of measures to improve accessibility between Halton and other Merseyside authorities is unlikely to materially decrease this distance. This is well beyond the 25.5km that the England Leisure Day Visits Survey indicates that people typically travel to visit the coast for the day. With the above in mind it can be concluded that Halton is likely to make a negligible contribution to recreational activity in the Mersey Narrows and North Wirral Foreshore pSPA/pRamsar site.
- 6.23 HRA screening identified potential pathways of effects between the expansion of Liverpool John Lennon Airport (JLA) (Core Delivery Policy 7) and disturbance of qualifying bird species due to increase in bird scaring devices and airplanes taxiing and due to increased light in the vicinity, which could create disturbance issues for birds using the SPA/Ramsar. Expansion of the Airport is likely to result in extension of the approach lighting gantry which already extends into the Mersey Estuary. The airport masterplan refers to increased lighting as a result of the airport expansion, and notes that birds and bats may be affected by this (Peel Airports, 2006). It is not clear at this stage to what degree the extension may increase illumination of the SPA although it is noted that the use of the SPA by waterfowl remains high despite the north bank of the Mersey generally being a brightly lit environment.

Recommendations for amendment to policy

- 6.24 Policy CS16 of the Halton Core Strategy does state that '*negative environmental and social issues associated with the operation and expansion of JLA should be satisfactorily addressed including measures to reduce or alleviate the impacts on the natural and built environment, including areas of international, national or local conservation, ecological and landscape value*'. Provided this is amended in line with recommendations in Chapter 5 (i.e. adding: '*With respect to internationally important sites such measures will need to be sufficiently extensive to enable a conclusion of no adverse effect on integrity unless it can be demonstrated that there are both no alternatives and Imperative Reasons of Over-riding Public Interest*') the Core Strategy will contain adequate policy protection to ensure that no adverse effect occurs.

⁵⁹ Natural England, Countryside Council for Wales and Welsh Assembly Government (January 2010) 'The Dee Estuary European Marine Site'

Renewable Energy

Appropriate Assessment

- 6.25 The Core Strategy promotes renewable and low carbon energy within Halton (policy CS18). HRA Screening identified that, should this include wind turbine construction, a pathway exists for the construction of onshore/offshore turbines to disrupt flight paths and displace qualifying bird species. Disturbance issues associated with maintenance activities were also identified.
- 6.26 The policy states that subject to successful assessment and mitigation of impacts of development proposals, Halton would seek to direct proposals for grid-connected renewable and low carbon energy infrastructure and equipment, including, but not limited to: wind, solar PV and biomass CHP, to the identified priority zone areas. This policy is being informed by The Liverpool City Regional Renewable Energy Options⁶⁰ which identifies three priority zone areas for wind energy, none of which are located within the Borough of Halton. It is therefore unlikely that the Policy CS18 of the Halton Core Strategy will result in the development of wind turbines.

Conclusion

- 6.27 The Appropriate Assessment has concluded that with the incorporation of the measures listed above with regard to water quality and expansion of John Lennon Airport, the draft publication Halton Core Strategy would include an adequate policy framework to enable the delivery of measures to avoid or adequately mitigate an adverse effect on the integrity of the Mersey Narrows & North Wirral Foreshore pSPA/pRamsar site.

⁶⁰ Arup (2001) Liverpool City Regional Renewable Energy Options Stage 2 (Drawing Title CHP/DH & Wind Priority Zones, Final Issue) (date 27/5/2010)

7 Sefton Coast SAC

Introduction

- 7.1 Located to the north of Liverpool, the Sefton Coast SAC (approximately 4,560ha) consists of a mosaic of sand dune communities comprising a range of ages from embryonic (i.e. dune formation) to more established communities. A number of other habitats are also present, including lagoons, estuaries and riverine environments, but also scrub, heath and coniferous woodland.

Reasons for Designation

- 7.2 The Sefton Coast qualifies as an SAC for both habitats and species. Firstly, the site contains the Habitats Directive Annex I habitats of:

- embryonic shifting sand dunes: considered rare, as its total extent in the United Kingdom is estimated to be less than 1,000 hectares – the Sefton Coast SAC is considered to be one of the best areas in the United Kingdom;
- shifting dunes along the shoreline with marram *Ammophila arenaria* (“white dunes”): the Sefton Coast SAC is considered to be one of the best areas in the United Kingdom;
- fixed dunes with herbaceous vegetation (“grey dunes”): the Sefton Coast SAC is considered to be one of the best areas in the United Kingdom;
- dunes with creeping willow *Salix repens ssp. argentea (Salicion arenariae)*: considered rare, as its total extent in the United Kingdom is estimated to be less than 1,000 hectares – the Sefton Coast SAC is considered to support a significant presence of the species;
- humid dune slacks: the Sefton Coast SAC is considered to be one of the best areas in the United Kingdom; and
- Atlantic decalcified fixed dunes (*Calluno-Ulicetea*): considered rare, as its total extent in the United Kingdom is estimated to be less than 1,000 hectares – the Sefton Coast SAC is considered to support a significant presence.

- 7.3 Secondly, the site contains the Habitats Directive Annex II species petalwort *Petalophyllum ralfsii*, for which it is one of the best areas in the United Kingdom, and great-crested newt *Triturus cristatus*, for which the area is considered to support a significant presence.

Historic Trends and Current Pressures

- 7.4 The dune habitats of the Sefton Coast SAC are dependent upon natural erosive processes. Various human activities that interrupt natural sedimentation and deposition patterns within the Liverpool Bay have had an effect on the wildlife value of these dunes and their existence. Since as early as the 18th century, ‘dredging, river training and coastline hardening have imposed a pattern of accretion and erosion on the shoreline where previous conditions were much more variable’ (Liverpool Hope University College, 2006). More recently, the dunes have been partially

stabilised through maintaining their natural vegetation, the planting of pine trees, and artificial sea defences for protecting the developed shorelines. Another compounding influence is that the inland lakes and mosses behind the belt of coastal dunes have been drained and claimed for agricultural production (Liverpool Hope University College, 2006).

7.5 The environmental requirements of the Sefton Coast SAC are mainly:

- the need to reduce the fragmentation of habitats, and the impact of fragmentation, to provide stepping stones for the movement of species;
- the need to counter negative changes to low-nutrient habitats resulting from atmospheric nutrient deposition;
- the need to manage the continuing coastal erosion at Formby Point which leads to a squeeze on habitats. This management would not constitute formal defences as these would in themselves harm the dune ecosystem, but the management of pine plantations preventing dune roll-back. The dunes require sufficient space that natural processes can maintain the important habitats through roll-back;
- the need to consider the potential impact of climate change on shorelines, wetlands and dunes;
- the need to manage abstraction from the underlying aquifer for sources such as golf courses. The aquifer is critical to some features of the site, such as the humid dune slacks and the great crested newts;
- to manage recreational pressures and direct disturbance to qualifying habitats;
- the need to develop and maintain management practices which sustain the conservation value of the area; and
- the need to avoid loss of great-crested newt habitat, and habitats being further fragmented by distance or barriers.

Key potential pressures from Halton

7.6 From the environmental requirements that have been identified above it can be determined that the following impacts of development could interfere with the above environmental requirements and processes on the SAC:

- Excessive recreational pressure.
- Deteriorating air quality as a result of increased deposition of SO₂/NO_x through increased aircraft movements.

Role of other plans and projects

Projects

- Peel Ports 'Super Port' – potential impacts due to increased sulphur deposition from shipping, physical disturbance of habitat, mobilisation of contamination, possible disturbance of waterfowl from noise and shipping activity;

Plans

- North West England & North Wales Shoreline Management Plan 2 – possible impacts due to the maintenance or enhancement of flood defences could lead to coastal squeeze, changes in sediment release (if previously undefended areas become defended) and direct loss of habitat to flood defence footprint;
- Core Strategies for Liverpool, West Lancashire, Knowsley, Sefton, Wirral and St Helens, the Mersey Heartlands Growth Point Programme of Delivery (Wirral and Liverpool) and Liverpool and Wirral Waters Development masterplans – possible water quality, air quality and wildfowl disturbance impacts as a result of delivery of 90,000 dwellings and associated commercial development over the next 20 years; and
- Merseyside Joint Waste Development Plan Document – possible impacts due to water quality, air quality and wildfowl disturbance or chick predation. However, since this DPD is itself subject a recent HRA it will address its own contribution to any ‘in combination’ effect that may otherwise arise.

Recreational trampling

Appropriate Assessment

- 7.7 Sand dunes are vulnerable to recreational trampling in that excessive physical disturbance can retard or set back the dune development process and lead to a reduction in habitat diversity. However, at the same time some recreational trampling is beneficial in that it ensures that the dune vegetation does not all succeed to the same late stage of development and thereby actually helps to preserve diversity.
- 7.8 A recent study on the recreational users of Sefton’s Natural Coast⁶¹ estimated half of the recreational users to be ‘local residents’ (i.e. residents within the Borough of Sefton). With respect to reasons for visiting the coast over half of the respondents main reason was either dog walking/walking/fresh air or visiting the coast. Nature based attractions including visiting the squirrels, bird watching, fishing accounted for approximately 20% of the visitors. The majority of visitors were focused on Formby and Crosby.
- 7.9 Unfortunately the study did not explore where the remaining 50% of visitors (i.e. not local residents from Sefton) came from. However, respondents to the England Leisure Day Visits Survey indicated that they typically travelled 25.5km to visit the coast for the day. The nearest access point to the Sefton Coast SAC is located a minimum of 26km from the main urban areas of Halton if one follows transport routes. The urban areas of Halton therefore lie outside the typical distance people could be expected to travel to visit the coast for the day. While it is likely that some Halton residents do visit the Sefton Coast SAC it also seems reasonable to conclude that Halton residents probably constitute a very small proportion of visitors to the SAC and that a far greater portion come from Borough of Liverpool which is much closer to Sefton Coast, and other adjacent Boroughs outside of Merseyside (e.g. in within Lancashire).

⁶¹ England’s North West Research Service for Economic Development and Tourism (May 2009) Sefton’s Natural Coast Local Users of the Coast (Version 2)

- 7.10 Policies contained within the Halton Core Strategy relate to a greater connectivity and accessibility from Halton to other Merseyside Boroughs as well as the delivery of 8,000 new dwellings. These policies include the provision of infrastructure (CS5) including transport infrastructure (roads, railways, public transport, walking, cycle routes including sustainable transport (CS14); Mersey Gateway Bridge construction to improve cross-river sustainable transport opportunities (CS15). However, the delivery of measures to improve accessibility between Halton and other Merseyside authorities is unlikely to materially decrease the distance needed to travel from Halton to the Sefton Coast.

Air quality

Appropriate Assessment

- 7.11 With regards to air quality impacts relating to atmospheric sulphur deposition, these will relate largely to shipping and airport expansion. The Site Relevant Critical Load on APIS currently indicates that 34% of sulphur deposition within the SAC is due to shipping and 'other transport' (the latter category excludes road transport but does include air travel). However, reference to APIS⁶² indicates that the actual SO₂ concentration in the SAC is well below the critical level (according to APIS the concentration⁶³ is 1.1 µgm⁻³ compared to a critical level for damage of 20 µgm⁻³).
- 7.12 With regards to eutrophication as a result of atmospheric nitrogen deposition, sand dune succession and petalwort are both vulnerable to excessive nitrogen inputs in that this can increase the development of vegetation and both out-compete petalwort and more rapidly advance sand dune succession to a point of excessive scrub development. Moreover, the Site Relevant Critical Load on APIS for nitrogen deposition indicates that actual nitrogen deposition is 11.9 kgN/ha/yr compared to a critical load (for sand dunes) of 10-20 kgN/ha/yr. The site is therefore already exceeding its critical load. Road transport, air transport and shipping are currently responsible for 14% of nitrogen deposition in the SPA. Since the site is already exceeding its critical load any source of NO_x which will increase nitrogen inputs by more than 1%⁶⁴ will at least require a project level Appropriate Assessment and could lead to an adverse impact 'in combination'.
- 7.13 The Sefton Coast SAC does not lie within 200m of a major arterial route for traffic travelling from Halton to (or through) Sefton and therefore it is primarily airport expansion that will contribute to any increase in nitrogen deposition. However, Policy CSxx (Liverpool John Lennon Airport) already states that negative environmental and social issues associated with the operation and expansion of JLA should be satisfactorily addressed including measures to reduce or alleviate the impacts on the natural environment, including locally, nationally and internationally important sites. Assuming that the additional wording identified in Chapter 5 (*'With respect to internationally important sites such measures will need to be sufficiently extensive to enable a conclusion of no adverse effect on integrity unless it can be demonstrated that there are both no alternatives and Imperative Reasons of Over-riding Public Interest'*) is included, this would make clear the high

⁶² Air Pollution Information System <http://www.apis.ac.uk/>

⁶³ For grid reference SD271077

⁶⁴ 1% generally being the threshold used by the Environment Agency and Natural England to determine whether a point source can be scoped out as making a contribution that would be effectively inconsequential even when considered 'in combination'. Exceedence of the 1% threshold does not mean that adverse effects will result but does mean that the project/plan cannot be simply dismissed and further detailed consideration is required.

standards that would need to be achieved in order for mitigation to be deemed acceptable and adverse impacts of the Core Strategy could be ruled out.

Conclusion

- 7.14 The Appropriate Assessment has concluded that the draft publication Halton Core Strategy will not have an adverse effect on the integrity of the Sefton Coast SAC.

8 Ribble and Alt Estuaries SPA / Ramsar site

Introduction

- 8.1 The Ribble and Alt Estuaries SPA and Ramsar site is approximately 12,360ha, and consists of extensive sand- and mud-flats and, particularly in the Ribble Estuary, large areas of saltmarsh. There are also areas of coastal grazing marsh located behind the sea embankments. The saltmarshes, coastal grazing marshes intertidal sand- and mud-flats all support high densities of grazing wildfowl and are used as high-tide roosts. Important populations of waterbirds occur in winter, including swans, geese, ducks and waders. The highest densities of feeding birds are on the muddier substrates of the Ribble.
- 8.2 The SPA is also of major importance during the spring and autumn migration periods, especially for wader populations moving along the west coast of Britain. The larger expanses of saltmarsh and areas of coastal grazing marsh support breeding birds during the summer, including large concentrations of gulls and terns. These seabirds feed both offshore and inland, outside of the SPA. Several species of waterbird (notably pink-footed goose *Anser brachyrhynchus*) utilise feeding areas on agricultural land outside of the SPA boundary. There is considerable interchange in the movements of wintering birds between this site and Morecambe Bay, the Mersey Estuary, the Dee Estuary and Martin Mere.

Reasons for Designation

- 8.3 The Ribble and Alt Estuaries site is designated as an SPA for its Birds Directive Annex I species, both breeding and over-wintering, and these are:
- 8.4 During the breeding season:
- common tern *Sterna hirundo*: 182 pairs = 1.5% of the breeding population in Great Britain;
 - ruff *Philomachus pugnax*: 1 pair = 9.1% of the breeding population in Great Britain;
- 8.5 Over winter:
- bar-tailed godwit *Limosa lapponica*: 18,958 individuals = 35.8% of the population in Great Britain;
 - Bewick's swan *Cygnus columbianus ssp. bewickii*: 229 individuals = 3.3% of the population in Great Britain;
 - golden plover *Pluvialis apricaria*: 4,277 individuals = 1.7% of the population in Great Britain
 - whooper swan *Cygnus cygnus*: 159 individuals = 2.9% of the population in Great Britain.
- 8.6 It also meets the criteria for SPA designation under Article 2 of the Birds Directive, supporting internationally important populations of lesser black-backed gull *Larus fuscus*, ringed plover *Charadrius hiaticula*, sanderling *Calidris alba*, black-tailed godwit *Limosa limosa ssp. limosa*, dunlin *Calidris alpina alpina*, grey plover *Pluvialis squatarola*, knot *Calidris canutus*, oystercatcher *Haematopus ostralegus*, pink-footed goose *Anser brachyrhynchus*, pintail *Anas*

acuta, redshank *Tringa totanus*, sanderling *Calidris alba*, shelduck *Tadorna tadorna*, teal *Anas crecca* and wigeon *Anas penelope*. It also qualifies by regularly supporting up to 29,236 individual seabirds, and, over winter, 301,449 individual waterfowl.

- 8.7 It is additionally designated as a Ramsar site in accordance with Criterion 5 (UN, 2005) for supporting up to 89,576 waterfowl (5-year peak mean 1998/99 – 2002/03), and in accordance with Criterion 6 for supporting internationally important populations of common shelduck *Tadorna tadorna*, black-tailed godwit *Limosa limosa ssp. limosa*, redshank *Tringa totanus*, Eurasian teal *Anas crecca*, northern pintail *Anas acuta* and dunlin *Calidris alpina alpina*.
- 8.8 The Ribble and Alt Estuaries also qualifies as Ramsar as it meets criterion 2 by supporting over 40% of the UK population of Natterjack toad. The Natterjack Toad occurs on the Sefton Coast in seaward dunes between Southport and Hightown. In 2000 it was present on 13 sites (three of which are reintroductions). The breeding population is estimated just over 1000 females.
- 8.9 The largest populations are on Ainsdale Sand Dunes NNR and Ainsdale and Birkdale Sandhills LNR. Natterjacks are absent from much of the dune coast and some breeding sites are relatively isolated (North Merseyside Biodiversity Action Plan, undated).

Historic Trends and Current Pressures

- 8.10 As an estuarine site linked with the Liverpool Bay, this site has been subject to the same changes as described for the Liverpool Bay SPA but additionally its own unique pressures (some similar to those experienced in the Mersey Estuary). The estuaries were largely undisturbed until the 19th century, at which point there was extensive modification and dredging of the river channel for the Port of Preston, as well as landfill and drainage along the shoreline in order to increase agricultural usage of the land. The Ribble Estuary has over the past century experienced ‘a general pattern of sediment accretion in the inner Estuary and erosion in outer areas,’ but the estuary has begun ‘to revert to its natural state... since maintenance of the Ribble Channel for shipping ceased in 1980. There have been dramatic changes in the course of channels in the outer Estuary, and these are expected to continue. Anticipated climatic and sea level changes are likely to exaggerate existing patterns of erosion and accretion, although sea level rise is not expected to cause significant loss of intertidal land in the Ribble⁶⁵.
- 8.11 The Ribble and Alt Estuaries are among ‘the most popular holiday destinations in Britain’, with Blackpool as the largest resort and Southport increasing in visitors. Leisure activities include ‘watersports such as sailing and windsurfing; fishing and shooting; bird watching; land yachting; and generally relaxing at the coast... enjoyed by both local people and visitors⁶⁶’.
- 8.12 Some of the main environmental pressures relevant to the nature conservation objectives of the Ribble and Alt Estuaries SPA / Ramsar site are:
- loss or damage of habitat as a result of increasing off-shore exploration and production activity associated with oil and natural gas;

⁶⁵ (Ribble Estuary Strategy Steering Group, 1997, p.15).

⁶⁶ (Ribble Estuary Strategy Steering Group, 1997, p.10).

- over-grazing of the saltmarshes by cattle-farming;
- heavy metal pollution (lead, cadmium, arsenic and other poisons) from either industry or disturbance of sediment (legacy pollution bound into the sediment);
- pollution via rivers by agricultural effluent flowing off fields, 'leading to increased fertility of inshore waters and associated algal blooms and de-oxygenation of seawater, particularly in enclosed bays and estuaries';
- pollution via rivers and drains by both treated sewerage and untreated runoff containing inorganic chemicals and organic compounds from everyday domestic products, which 'may combine together in ways that make it difficult to predict their ultimate effect of the marine environment... Some may remain indefinitely in the seawater, the seabed, or the flesh, fat and oil of sea creatures';
- damage of marine benthic habitat directly from fishing methods;
- damage of marine benthic habitat directly or indirectly from aggregate extraction;
- 'coastal squeeze' (a type of coastal habitat loss) from land reclamation and coastal flood defences and drainage used in order to farm or develop coastal land, and from sea level rise;
- harm to wildlife (especially birds) or habitat loss due to increasing proposals/demand for offshore wind turbines;
- pollution, direct kills, litter, disturbance or loss of habitat as a result of water-based recreation or other recreation activity and related development along the foreshore⁶⁷
- that there is disturbance to birds from aircraft, both from Blackpool Airport and from a private testing station
- introduction of non-native species and translocation;
- selective removal of species (e.g. bait digging, wildfowl, fishing) (Wildlife Trust, 2006 and Ribble Estuary Strategy Steering Group, 1997);
- interruption of dune accretion processes leading to over-stabilisation of dunes;
- the spread of rank grasses and scrub, partly caused by a decline in rabbit-grazing, further reducing suitable habitat;
- losses to development, forestry and recreational uses have reduced the area of available habitat;
- fragmentation of habitat has led to isolation of populations;
- creation of permanent water bodies in the dunes has encouraged populations of invertebrates which prey on Natterjack tadpoles and, most seriously, of Common Toads which both predate and suppress the development of Natterjack tadpoles;
- gassing of rabbits, especially on golf courses, can kill Natterjacks using burrows and removes a valuable grazing animal;

⁶⁷ Wildlife Trust (2006) – The Wildlife Trust For Lancashire, Manchester And North Merseyside (2006). *Uses and abuses*. [Online]. Available at: <http://www.lancswt.org.uk/Learning%20&%20Discovery/theirishsea/usesandabuses.htm> (accessed 15th June 2009).

- collecting and disturbance of spawn and tadpoles can reduce metamorphic success;
- inappropriate management can cause the loss of low vegetation structure and open ground used by Natterjacks for foraging;
- water abstraction, conifers and scrub lower the water table locally and reduces the number of pools in which Natterjack tadpoles can develop to maturity.

8.13 There is both formal and informal recreation along the Sefton Coast and intensity varies with season, event and attraction. Recreation is much more informal within the Ribble Estuary itself.

Key potential pressures from Halton

8.14 From the environmental requirements that have been identified above it can be determined that the following impacts of development could interfere with the above environmental requirements and processes on the pSPA and pRamsar:

- water quality from one or more of the following pathways to the River Mersey (with hydraulic connections to this pSPA and pRamsar: discharge of treated sewage effluent into the Mersey; potential water pollution incidents arising from construction of Mersey Gateway Bridge/Mersey Gateway Port development (Runcorn), untreated runoff containing inorganic and organic compounds;
- water quality from increase in commercial shipping resulting from development of Mersey Gateway Port (Runcorn);
- pollution, direct kills, litter, disturbance or loss of habitat as a result of water-based recreation or other recreation activity and related development along the foreshore (Wildlife Trust, 2006).
- Deteriorating air quality as a result of increased deposition of SO₂/NO_x through increased aircraft, shipping or vehicle movements.

8.15 Local air quality issues arising from the Core Strategy are scoped out of consideration since the site is physically separated from Halton.

Role of other plans and projects

8.16 It was considered that the following projects and plans could act 'in combination' with the Core Strategy:

Projects

- Peel Ports 'Super Port' – potential impacts due to increased sulphur deposition from shipping, physical disturbance of habitat, mobilisation of contamination, possible disturbance of waterfowl from noise and shipping activity;

Plans

- Liverpool City Region Renewable Energy Capacity Study – possible impacts on waterfowl flightpaths between the Ribble & Alt Estuaries SPA and other European sites depending upon the degree of wind power involved and the location of turbines;

- North West England & North Wales Shoreline Management Plan 2 – possible impacts due to the maintenance or enhancement of flood defences could lead to coastal squeeze, changes in sediment release (if previously undefended areas become defended) and direct loss of habitat to flood defence footprint;
- Core Strategies for Liverpool, West Lancashire, Knowsley, Sefton, Wirral and St Helens, the Mersey Heartlands Growth Point Programme of Delivery (Wirral and Liverpool) and Liverpool and Wirral Waters Development masterplans – possible water quality, air quality and wildfowl disturbance impacts as a result of delivery of 90,000 dwellings and associated commercial development over the next 20 years; and
- Merseyside Joint Waste Development Plan Document – possible impacts due to water quality, air quality and wildfowl disturbance or chick predation. However, since this DPD is itself subject a recent HRA it will address its own contribution to any ‘in combination’ effect that may otherwise arise.

Appropriate Assessment

Disturbance

Appropriate Assessment

- 8.17 Although the coast that lies adjacent to the Ribble & Alt Estuaries SPA/Ramsar site draws tourists from across the county due to the proximity of Blackpool in particular, these tourist activities are focussed upon the Ribble Estuary which is the furthest part of the SPA/Ramsar site from Halton. With regard to visitors from Merseyside the southern part of the site (i.e. that largely contiguous with the Sefton Coast SAC) is of greater relevance.
- 8.18 As the southern part of the Ribble and Alt Estuary SPA/Ramsar largely falls within the same geographical area as Sefton Coast SAC, the recreational pressures described for Sefton Coast SAC (above) are largely applicable to this site. One key difference is that recreational pressures in the Ribble and Alt Estuary SPA/Ramsar related more to the bird interest and some species for which the site is designated (e.g. nesting terns) may be subject to different recreational disturbance in the fact that they use slightly different habitats than the SAC was designated for (i.e. sandflats and intertidal mudflats rather than coastal dunes). Furthermore since most of the interest of the SPA is in its wintering birds, the risk of recreational disturbance may be lower since there will be less recreational activity in winter. Natterjack toads however are qualifying Ramsar species, and would be more sensitive to disturbance during the spring/summer months when toadlets leave breeding ponds (the breeding ponds are generally fenced off/protected but toadlets leaving these ponds would be more subject to disturbance).
- 8.19 The nearest access point to the Sefton Coast (and thus the Ribble & Alt Estuaries SPA/Ramsar site) is located a minimum of 26km from the main urban areas of Halton if one follows transport routes. The urban areas of Halton therefore lie outside the typical distance people could be expected to travel to visit the coast for the day. While it is likely that some Halton residents do visit this part of the SPA/Ramsar site it also seems reasonable to conclude that Halton residents probably constitute a very small proportion of visitors to the Sefton Coast and that a greater portion come from Borough of Liverpool and other adjacent Boroughs outside of Merseyside (e.g. in within Lancashire).

- 8.20 Policies contained within the Halton Core Strategy relate to a greater connectivity and accessibility from Halton to other Merseyside Boroughs. These policies include the provision of infrastructure (CS5) including transport infrastructure (roads, railways, public transport, walking, cycle routes including sustainable transport (CS14); Mersey Gateway Bridge construction to improve cross-river sustainable transport opportunities (CS15). However, the delivery of measures to improve accessibility between Halton and other Merseyside authorities is unlikely to materially decrease the distance needed to travel from Halton to the Sefton Coast.

Air quality

Appropriate Assessment

- 8.21 The Site Relevant Critical Load on APIS currently indicates that 34% of sulphur deposition within the SAC is due to shipping and 'other transport' (the latter category excludes road transport but does include air travel). However, reference to APIS⁶⁸ indicates that the actual SO₂ concentration in the SAC is well below the critical level (according to APIS the concentration⁶⁹ is 1.1 µgm⁻³ compared to a critical level for damage of 20 µgm⁻³). The Site Relevant Critical Load on APIS for nitrogen deposition indicates that actual nitrogen deposition is 11.9 kgN/ha/yr compared to a critical load (for sand dunes) of 10-20 kgN/ha/yr. The site is therefore already exceeding its critical load. Road transport, air transport and shipping are currently responsible for 14% of nitrogen deposition in the SPA.
- 8.22 However, the Site Relevant Critical Load for each bird for which the SPA was designated also seems to indicate that they are not considered likely to be affected by high sulphur deposition. It should also be noted that APIS concludes the effects may be positive for most birds because nitrogen enrichment potentially means more prey species. The only SPA species for which nitrogen deposition is identified on APIS as being potentially negative are black-tailed godwit *Limosa limosa* and curlew *Numenius arquata* (if nitrogen deposition increases the sward height of their grassland foraging grounds); however, sward height is much more strongly influenced by other factors than atmospheric nitrogen deposition such as cut height & frequency and conventional fertilisation.
- 8.23 The Ribble & Alt Estuaries SPA/Ramsar site does not lie within 200m of a major arterial route for traffic travelling from Halton to (or through) Sefton and therefore it is primarily airport expansion that will contribute to any increase in nitrogen deposition. However, **Policy CSxx** (Liverpool John Lennon Airport) already states that negative environmental and social issues associated with the operation and expansion of JLA should be satisfactorily addressed including measures to reduce or alleviate the impacts on the natural environment, including locally, nationally and internationally important sites. Assuming that the additional wording identified in Chapter 4 (*'With respect to internationally important sites such measures will need to be sufficiently extensive to enable a conclusion of no adverse effect on integrity unless it can be demonstrated that there are both no alternatives and Imperative Reasons of Over-riding Public Interest'*) is included, this would make clear the high standards that would need to be achieved in order for mitigation to be deemed acceptable and adverse impacts of the Core Strategy could be ruled out.

⁶⁸ Air Pollution Information System <http://www.apis.ac.uk/>

⁶⁹ For grid reference SD271077

Water Quality Deterioration

Appropriate Assessment

- 8.24 Deterioration in water quality is a key environmental pressure being experienced by The Ribble and Alt Estuary SPA/Ramsar, namely through heavy metal pollution from industry and sediment disturbance, pollution via rivers from agricultural effluent, and pollution via rivers and drains by both treated sewerage and untreated runoff containing inorganic chemicals and organic compounds from everyday domestic products.
- 8.25 Hydraulic connections were identified during Screening between the Ribble and Alt Estuary SPA/Ramsar and the Mersey Estuary located within the Borough of Halton. Chapter 4 provides an Appropriate Assessment of these identified pathways from the Halton Core Strategy to the Mersey Estuary. These potentially significant effects could be to be relevant on the Ribble and Alt SPA/Ramsar due to the hydraulic connections. These changes could arise from:
- waste water discharge (domestic and industrial) and surface water runoff;
 - shipping, port/dock expansion and associated navigational dredging/ship wash.
- 8.26 It is worth considering at this point that the majority of water quality pressures being experienced by the SPA/Ramsar are likely to arise from the River Ribble, the River Alt as well as the River Mersey. Furthermore it should be noted the sections of the Mersey immediately adjacent to the Liverpool and Wirral Boroughs are much closer to the SPA/Ramsar (within 5km) compared to the section of Mersey within Halton (over 20km). With this in mind policies contained within Halton Core Strategy that may result in deterioration in water quality in the River Mersey are unlikely to result in a significant adverse effect on the qualifying features of the Ribble and Alt Estuary SPA/Ramsar. Nevertheless, the in-combination contribution to the water quality of the Mersey should be considered and mitigated appropriately.

Recommendations for amendment to policy

- 8.27 The recommendations given in Chapter 5 for addressing water quality and dredging/port development related impacts with regard to the Mersey Estuary SPA/Ramsar site would also serve for Mersey Narrows & North Wirral Foreshore pSPA/pRamsar site.

Conclusion

- 8.28 The Appropriate Assessment has concluded that with the incorporation of the measures listed above, the draft publication Halton Core Strategy would include an adequate policy framework to enable the delivery of measures to avoid or adequately mitigate an adverse effect on the integrity of the Ribble & Alt Estuaries SPA/pRamsar site.

9 Liverpool Bay SPA and pRamsar

Introduction

9.1 The Liverpool Bay SPA and pRamsar site is an approximately 198,000ha maritime site located in the Irish Sea, straddling the English and Welsh borders. The site has exposed mudflats and sandbanks in places, although the site extends up to approximately 20km from the shoreline and thus most of the area of the SPA/pRamsar site is relatively shallow water up to 20m deep. It is contiguous with a number of other European sites, including the Ribble and Alt Estuaries SPA and Ramsar site, Mersey Narrows and North Wirral Foreshore pSPA and pRamsar site, and Mersey Estuary SPA and Ramsar site.

Reasons for Designation

9.2 Liverpool Bay SPA was designated from a pSPA to SPA in July 2010. Liverpool Bay has been identified by Natural England and CCW as qualifying for SPA status under the following Stage 1 guidelines:

- Liverpool Bay regularly supports over 1% of the GB population of one species listed on Annex I of the EC Directive on the Conservation of Wild Birds (79/409/EEC): red-throated diver (*Gavia stellata*). The mean peak count of overwintering red-throated divers within the pSPA boundary over the period 2001/02 – 2005/06 was 922 individuals: or 5.4% of GB's total estimated overwintering population.
- Liverpool Bay regularly supports more than 1% of the biogeographical population of one regularly occurring migratory species: common scoter (*Melanitta nigra*). The mean peak overwintering common scoter population of 54,675 individuals between 2001/02 – 2005/06 is an estimated 58% of the GB population.
- The site also supports more than 20,000 waterbirds in the non-breeding season with a mean peak average over 2001/02 – 2005/06 of at least 55,597, with at least 80,346 in winter 2001/02.

9.3 In 2004, a study team of the Joint Nature Conservation Committee (JNCC) (referred to in citation as 'Webb et al.') produced two reports on a potential Liverpool Bay SPA, the first on the recommendation for designation, and the second on boundary options. The report also mentions its potential qualification as a Ramsar site due to the large numbers of waterfowl supported (Criterion 5 regarding Article 2 of the Ramsar Convention).

9.4 Other species that might be judged for inclusion:

- great-crested grebe *Podiceps cristatus*,
- common eider *Somateria mollissima*,
- red-breasted merganser *Mergus serrator*, and
- little gull *Larus minutus* (Webb et al., 2004b);

Historic Trends and Current Pressures

- 9.5 With the proposed site encompassing approximately 198,000 hectares and a range of estuarine and maritime habitat, the Liverpool Bay SPA and pRamsar site is subject to a wide range of pressures of varying spatial scope and human activity. Perhaps the most direct way to establish the proposed site's recent changes in health / ecological status is through the changing environmental pressures upon the Irish Sea.
- 9.6 The industrial revolution of the 19th century led to the Irish Sea being used to dispose liquid waste, including sewage and unwanted by-products of industrial processes (including mining, manufacturing, nuclear waste reprocessing and energy generation). This improved in the latter half of the 20th century, and sewage and other waste are no longer dumped offshore in an uncontrolled manner. While Liverpool Bay is hypernutrified, there is no evidence of harmful algal blooms or de-oxygenation of seawater (Environment Agency, pers. comm.).
- 9.7 Some of the main existing environmental pressures on the Irish Sea relevant to the nature conservation objectives of the Liverpool Bay SPA and pRamsar site are:
- disturbance of sediment releasing legacy heavy metal pollution (lead, cadmium, arsenic and other poisons) that is bound into the sediment;
 - pollution via rivers and drains by both treated sewerage and untreated runoff containing inorganic chemicals and organic compounds from everyday domestic products, which '*may combine together in ways that make it difficult to predict their ultimate effect of the marine environment... Some may remain indefinitely in the seawater, the seabed, or the flesh, fat and oil of sea creatures*';
 - pollution via commercial shipping by chemical or noise pollution and the dumping of litter at sea;
 - damage of marine benthic habitat directly from fishing methods;
 - damage of marine benthic habitat directly or indirectly from aggregate extraction;
 - 'coastal squeeze' (a type of coastal habitat loss) from land reclamation and coastal flood defences and drainage used in order to farm or develop coastal land, and from erosion and sea level rise;
 - loss or damage of marine benthic habitat directly and indirectly (through changed sedimentation/deposition patterns) as a result of navigational dredging in order to accommodate large vessels – e.g. into the ports of Liverpool;
 - harm to wildlife (especially birds) or habitat loss due to increasing proposals/demand for offshore wind turbines; and
 - pollution, direct kills, litter or loss of habitat as a result of water-based recreation and related development along the foreshore.

Key Pressures from Halton

- 9.8 From the environmental requirements that have been identified above it can be determined that the following impacts of development could interfere with the above environmental requirements and processes on the SPA and pRamsar:
- water quality from one or more of the following pathways to the River Mersey: discharge of treated sewage effluent into the Mersey; potential water pollution incidents arising from construction of Mersey Gateway Bridge/Mersey Gateway Port development (Runcorn), untreated runoff containing inorganic and organic compounds;
 - water quality from increase in commercial shipping resulting from development of Mersey Gateway Port (Runcorn);
 - loss or damage of marine benthic habitat directly and indirectly (through changed sedimentation/deposition patterns) as a result of navigational dredging in order to accommodate large vessels – e.g. into Mersey Gateway Port; and
 - pollution, direct kills, litter, disturbance or loss of habitat as a result of water-based recreation or other recreation activity along the foreshore.
- 9.9 Local air quality issues arising from the Core Strategy are scoped out of consideration since the site is physically separated from Halton.

Role of other projects and plans

- 9.10 It is considered that the following additional plans and projects could act 'in combination' on the SPA/pRamsar:

Projects

- Gwynt Y Mor Offshore Windfarm Project - possible impacts on waterfowl flightpaths within Liverpool Bay;
- Peel Ports 'Super Port' – potential impacts due to increased sulphur deposition from shipping, physical disturbance of habitat, mobilisation of contamination, possible disturbance of waterfowl from noise and shipping activity;
- Liverpool John Lennon Airport expansion – potential impacts due to increased sulphur and nitrogen deposition from aircraft, loss of supporting foraging/high-tide roost habitat and possible disturbance of waterfowl from noise;
- Proposed incinerators at Runcorn and Ince Marches – possible air quality impacts through nitrogen and sulphur deposition; and

Plans

- Liverpool City Region Renewable Energy Capacity Study – possible impacts on waterfowl flightpaths between the Mersey Estuary and other European sites depending upon the degree of wind power involved and the location of turbines;
- North West England & North Wales Shoreline Management Plan 2 – possible impacts due to the maintenance or enhancement of flood defences could lead to coastal squeeze, changes in

sediment release (if previously undefended areas become defended) and direct loss of habitat to flood defence footprint;

- Core Strategies for Flintshire, Denbighshire, Liverpool, Cheshire West and Chester, Knowsley, Sefton, Wirral and St Helens, the Mersey Heartlands Growth Point Programme of Delivery (Wirral and Liverpool) and Liverpool and Wirral Waters Development masterplans – possible water quality, air quality and wildfowl disturbance impacts as a result of delivery of over 110,000 dwellings and associated commercial development over the next 20 years; and
- Merseyside Joint Waste Development Plan Document – possible impacts due to water quality, air quality and wildfowl disturbance or chick predation. However, since this DPD is itself subject a recent HRA it will address its own contribution to any ‘in combination’ effect that may otherwise arise.

Appropriate Assessment

Water Quality Deterioration

Appropriate Assessment

- 9.11 Liverpool Bay SPA extends over the Mouth of the Mersey Estuary. It is therefore susceptible to changes in water quality within Mersey Estuary arising from:
- waste water discharge (domestic and industrial) and surface water runoff; and
 - shipping, port/dock expansion and associated navigational dredging/ship wash.
- 9.12 Chapter 5 provides an Appropriate Assessment of these identified pathways from the Halton Core Strategy to the Mersey Estuary. These potentially significant effects could also be to be relevant on Liverpool Bay SPA due to the hydraulic connections.
- 9.13 The Natural England Draft Conservation Objectives and Advice on Operation⁷⁰ provide more detail on the risk that the pollutants pose to the qualifying features of interest at the Liverpool Bay SPA.
- 9.14 With respect to waste water discharge, non-toxic contamination through nutrient loading, organic loading and changes to the thermal regime could impact on prey species and distribution. The sensitivity of the prey species of both red-throated diver and common scoter to non-toxic contamination is considered moderate. As benthic feeders, common scoter are closely associated with the availability and condition of their shallow sandbank habitat. As such they are considered highly sensitive to its physical loss and smothering and any adverse impact on benthic communities.
- 9.15 PCBs are toxic persistent organic pollutants used in industry as dielectric fluids for transformers, capacitors, coolants can bioaccumulate in the sublittoral prey species of the common scoter and bioaccumulate/ biomagnify in the fish species of the red-throated diver. If marine pollution were to occur there is the potential for exposure to PCBs to change. Hotspots of PCBs include industrial estuaries and sandy environments offshore, but as PCB's are currently banned, exposure can be

⁷⁰Natural England and Countryside Council for Wales (September 2009) *Liverpool Bay / Bae Lerpwl pSPA Conservation Objectives from Natural England and CCW, September 2009* http://www.naturalengland.org.uk/Images/LivBay-consobj_tcm6-15189.pdf

considered low. However disturbance of sediments through shipping, dock/port expansion and navigational dredging may release such hotspots of PCBs.

- 9.16 Large oil and chemical spills affecting shallow sandbank habitats can have a detrimental effect on bird populations as it can affect their food sources and also the birds directly especially during their moulting times when they are far less mobile. Sensitivity to non-synthetic compounds is therefore considered to be high. Oil on the feathers of birds could lead to loss of insulation, reduced buoyancy and possible drowning. Consequently both qualifying bird species may suffer the inability to feed, resulting in starvation and death. The possibility of a pollution event, however, has been considered and the overall assessment of exposure is considered to be low. This is a combination of 'normal' toxic contamination in the SPA plus the low risk of a catastrophic event. Although exposure is low, the possibility of a catastrophic event due to vessel traffic (oil tankers, ships with toxic contaminants etc) exists.

Recommendations for amendment to policy

- 9.17 The recommendations given in Chapter 5 for addressing water quality and dredging/port development related impacts with regard to the Mersey Estuary SPA/Ramsar site would also serve for Liverpool Bay SPA/pRamsar site.

Recreational Activities

Appropriate Assessment

- 9.18 Recreational disturbance arising from fishing, boating, visual impacts and noise are highlighted as pressures on the qualifying features of Liverpool Bay SPA⁷¹. North Wirral Foreshore SPA/pRamsar, Sefton Coast SAC and Ribble and Alt Estuaries SPA Ramsar are all subject to recreational pressure, and due to their close proximity to Liverpool Bay SPA/pRamsar, these same pressures are likely to be relevant. Red-throated diver winter inshore in water 0-20m deep (having one of their key concentrations off the north Wirral foreshore) and as such is likely to be particularly exposed to the impacts of water-borne recreation which largely takes place close to the shore.
- 9.19 Most of Liverpool Bay SPA is sufficiently far from the coast that coastal water-borne recreation (e.g. windsurfing, personal watercraft, water-skiing etc.) will constitute a small source of disturbance in comparison to conventional shipping. However, there is a margin of the site which abuts and is integrally linked with the North Wirral Foreshore and the Sefton Coast. As such, water-borne recreation around either coast will potentially affect not only the interest features of the Mersey Narrows & North Wirral Foreshore pSPA/pRamsar site and Ribble & Alt Estuaries SPA/Ramsar site but also Liverpool Bay SPA/pRamsar site. However, it has already been established in previous chapters that the Sefton Coast/Ribble & Alt Estuaries and North Wirral Foreshore are both sufficiently distant from Halton that the boroughs contribution to recreational activity within those sites is likely to be effectively inconsequential. This same conclusion will therefore apply to Liverpool Bay SPA/pRamsar site.

⁷¹ Natural England and Countryside Council for Wales (September 2009) *Liverpool Bay / Bae Lerpwl pSPA Conservation Objectives from Natural England and CCW, September 2009* http://www.naturalengland.org.uk/Images/LivBay-consobj_tcm6-15189.pdf

Renewable Energy

Appropriate Assessment

- 9.20 The Core Strategy promotes a renewable and low carbon energy within Halton (policy CS18). HRA Screening identified that, should this include wind turbine construction, a pathway exists for the construction of onshore/offshore turbines to disrupt flight paths and displace qualifying bird species. Disturbance issues associated with maintenance activities were also identified.
- 9.21 The policy states that subject to successful assessment and mitigation of impacts of development proposals, Halton would seek to direct proposals for grid-connected renewable and low carbon energy infrastructure and equipment, including, but not limited to: wind, solar PV and biomass CHP, to the identified priority zone areas. This policy is being informed by The Liverpool City Regional Renewable Energy Options⁷² which identifies three priority zone areas for wind energy, none of which are located within the Borough of Halton. It is therefore unlikely that the Policy CS18 of the Halton Core Strategy will result in the development of wind turbines.

Conclusion

- 9.22 The Appropriate Assessment has concluded that with the incorporation of the measures listed above, the draft publication Halton Core Strategy would include an adequate policy framework to enable the delivery of measures to avoid or adequately mitigate an adverse effect on the integrity of Liverpool Bay SPA/pRamsar site.

⁷² Arup (2001) Liverpool City Regional Renewable Energy Options Stage 2 (Drawing Title CHP/DH & Wind Priority Zones, Final Issue) (date 27/5/2010)

10 The Dee Estuary SAC, SPA & Ramsar site, pSPA Extension

- 10.1 The Dee Estuary SPA, Ramsar and SAC is located outside approximately 15km west of Halton Borough. An extension to the Dee Estuary forms a proposed SPA⁷³. The Dee is a large funnel-shaped sheltered estuary and is one of the top five estuaries in the UK for wintering and passage waterfowl populations. The Dee Estuary site covers over 13,000ha and is the largest macro-tidal coastal plain Estuary between the larger Severn Estuary and the Solway Firth. The Dee Estuary is hyper-tidal with a mean spring tidal range of 7.7m at the mouth. The site has extensive areas of intertidal sand-flats, mud-flats and saltmarsh. In areas where agricultural use has not occurred, the saltmarshes grade into transitional brackish and swamp vegetation on the upper shore. The site also supports three sandstone islands (the Hilbre islands) which have important cliff vegetation and maritime heathland and grassland. The two sides of the Estuary show a marked difference between the industrialised usage of the Welsh coastal belt and the residential and recreational English side.
- 10.2 The Dee Estuary supports internationally important numbers of waterfowl and waders. The estuary is an accreting system and the extent of saltmarsh continues to expand as the estuary seeks to achieve a new equilibrium situation following large-scale historical land-claim at the head of the estuary which commenced in the 1730s. Nevertheless, the estuary still supports extensive areas of intertidal sand and mudflats as well as saltmarsh. Where land-claim has not occurred, the saltmarshes grade into transitional brackish and freshwater swamp vegetation, on the upper shore. The site includes the three sandstone islands of Hilbre with their important cliff vegetation and maritime heathland/grassland. The site also includes an assemblage of nationally scarce plants and the sandhill rustic moth *Luperina nickerlii gueneei*, a British Red Data Book species. The two shorelines of the estuary show a marked contrast between the industrialised usage of the coastal belt in Wales and residential and recreational usage in England.

Reasons for Designation

- 10.3 The Dee Estuary qualifies as an SAC for both habitats and species. Firstly, the site contains the following Habitats Directive Annex I habitats:
- Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitriche-Batrachion* vegetation;
 - Mudflats and sandflats not covered by seawater at low tide;
 - *Salicornia* and other annuals colonising mud and sand - The Dee Estuary is representative of pioneer glasswort *Salicornia spp.* saltmarsh in the north-west of the UK. *Salicornia spp.* saltmarsh forms extensive stands in the Dee, especially on the more sandy muds where there is reduced tidal scour. It mainly occurs on the seaward fringes as a pioneer community, and moving landwards usually forms a transition to common saltmarsh-grass *Puccinellia maritima* saltmarsh (SM10). There is also a low frequency of *Salicornia spp.* extending well inland.

⁷³ Barbara McCarthy, Natural England (2009), *Pers. comms*, Telephone call 5th June 2009

Associated species often include annual sea-blite *Suaeda maritima* and hybrid scurvy grass *Cochlearia x hollandica*.

- Atlantic salt meadows (*Glauco-Puccinellietalia maritimae*) - The Dee Estuary is representative of H1330 Atlantic salt meadows in the north-west of the UK. It forms the most extensive type of saltmarsh in the Dee, and since the 1980s it has probably displaced very large quantities of the non-native common cord-grass *Spartina anglica*. The high accretion rates found in the estuary are likely to favour further development of this type of vegetation. The saltmarsh is regularly inundated by the sea; characteristic salt-tolerant perennial flowering plant species include common saltmarsh-grass *Puccinellia maritima*, sea aster *Aster tripolium*, and sea arrowgrass *Triglochin maritima*. In a few areas there are unusual transitions to wet woodland habitats.

10.4 Secondly, the site contains the following Habitats Directive Annex II habitats and species:

- Estuaries
- Annual vegetation of drift lines
- Vegetated sea cliffs of the Atlantic and Baltic coasts
- Embryonic shifting dunes
- Shifting dunes along the shoreline with *Ammophila arenaria* (`white dunes`)
- Fixed dunes with herbaceous vegetation (`grey dunes`)
- Humid dune slacks
- Sea lamprey *Petromyzon marinus*
- River lamprey *Lampetra fluviatilis*
- Petalwort *Petalophyllum ralfsii*

10.5 The Dee Estuary also qualifies as a SPA supporting:

10.6 During the breeding season;

- Common Tern *Sterna hirundo*, 277 pairs representing at least 2.3% of the breeding population in Great Britain (5 year mean 1991-95)
- Little Tern *Sterna albifrons*, 56 pairs representing at least 2.3% of the breeding population in Great Britain (RSPB, 5 year mean 1991-95)

10.7 On passage;

- Sandwich Tern *Sterna sandvicensis*, 818 individuals representing at least 5.8% of the population in Great Britain (5 year mean 1991-95)
- Redshank *Tringa totanus*, 8,451 individuals representing at least 4.8% of the Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)

10.8 Over winter;

- Bar-tailed Godwit *Limosa lapponica*, 1,013 individuals representing at least 1.9% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)

10.9 This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species:

- Black-tailed Godwit *Limosa limosa islandica*, 1,739 individuals representing at least 2.5% of the wintering Iceland - breeding population (5 year peak mean 1991/2 - 1995/6)
- Curlew *Numenius arquata*, 4,028 individuals representing at least 1.2% of the wintering Europe - breeding population (5 year peak mean 1991/2 - 1995/6)
- Dunlin *Calidris alpina alpina*, 22,479 individuals representing at least 1.6% of the wintering Northern Siberia/Europe/Western Africa population (5 year peak mean 1991/2 - 1995/6)
- Grey Plover *Pluvialis squatarola*, 2,193 individuals representing at least 1.5% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
- Knot *Calidris canutus*, 21,553 individuals representing at least 6.2% of the wintering Northeastern Canada/Greenland/Iceland/Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)
- Oystercatcher *Haematopus ostralegus*, 28,434 individuals representing at least 3.2% of the wintering Europe & Northern/Western Africa population (5 year peak mean 1991/2 - 1995/6)
- Pintail *Anas acuta*, 6,498 individuals representing at least 10.8% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)
- Redshank *Tringa totanus*, 6,382 individuals representing at least 4.3% of the wintering Eastern Atlantic - wintering population (5 year peak mean 1991/2 - 1995/6)
- Shelduck *Tadorna tadorna*, 6,827 individuals representing at least 2.3% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)
- Teal *Anas crecca*, 5,918 individuals representing at least 1.5% of the wintering Northwestern Europe population (5 year peak mean 1991/2 - 1995/6)

10.10 The Dee Estuary is also designated as an SPA for regularly supporting 130,408 individual waterfowl (5 year peak mean 1991/2 - 1995/6)⁷⁴.

10.11 In addition to the SPA designation the Dee Estuary is also designated as a Ramsar site by meeting Ramsar criteria 1, 5 and 6 as follows:

- Extensive intertidal mud and sand flats (20 km by 9 km) with large expanses of saltmarsh towards the head of the estuary.
- Supporting an overall bird assemblage of international importance; and
- Supporting the following species at levels of international importance: shelduck, oystercatcher, curlew, redshank, teal, pintail, grey plover, red knot, dunlin, bar-tailed godwit, black-tailed godwit and turnstone

⁷⁴ The Ramsar citation sheet identifies the waterfowl population as 74,230 using slightly more recent data (5 year peak mean 1998/99-2002/2003). However, this is still more than the 20,000 needed for consideration as being internationally important.

10.12 The historic trends and current pressures on the site are summarised below.

Historic Trends and Current Pressures

10.13 The majority of the site is in the ownership and sympathetic management of public bodies and voluntary conservation organisations. Unlike most western estuaries, sizeable areas of saltmarsh in the Dee remain ungrazed and therefore plant species that are susceptible to grazing are widespread. This distinctive flora would therefore be sensitive to an increase in grazing pressure. The intertidal and subtidal habitats of the estuary are broadly subject to natural successional change, although shellfisheries and dredging are a current concern. Threats to the estuary's conservation come from its industrialised shorelines on the Welsh side and the impact of adjacent historic industrial use. These include land contamination from chemical and steel manufacture and localised water quality problems. Remediation works are being undertaken. Contemporary issues relate to dock development and navigational dredging, coastal defence works and their impact on coastal process, regulation of shellfisheries, and the recreational use of sand dunes and saltmarshes.

10.14 The environmental pressures upon the Dee Estuary SAC, SPA & Ramsar site are mainly:

- overgrazing of ungrazed/little grazed saltmarsh;
- certain recreational activities in sensitive areas at sensitive times such as shellfishing (in terms of loss of material from the food chain) and dog walking (in terms of disturbance of waterfowl)
- water quality threats from ex-industrial usage and agriculture;
- physical loss and alteration of coastal processes due to navigational dredging;
- 'coastal squeeze' from land reclamation and coastal flood defences and drainage used in order to develop coastal land, and from sea level rise;
- introduction of non-native species; and
- risk of excessive abstraction resulting in a decrease in freshwater flows into the estuary, reducing drinking and bathing habitat for birds and increasing the salinity in localised areas.

Key potential pressures from Halton

10.15 From the environmental requirements that have been identified above it can be determined that the following impacts of development requires investigation, since if it occurred it could interfere with the above environmental requirements and processes on the SAC/SPA/Ramsar:

- Damaging levels of abstraction to supply housing in Halton when considered in combination with development elsewhere in United Utilities Integrated Resource Zone and development outside the zone that will receive water from the same sources (e.g. abstraction from the River Dee in relation to development in North Wales).
- Increased recreational pressure when considered 'in combination' with the additional dwellings to be delivered throughout Cheshire, Merseyside and North Wales over the same time period, coupled with possible disturbance due to Liverpool Airport and the Peel 'SuperPort' projects.

Appropriate Assessment

Disturbance

Appropriate Assessment

- 10.16 The Dee Estuary is located 24km from Halton (distance measured by roads). The England Leisure Day Visits surveys indicate that respondents typically traveled 25.5km to visit the coast (not including 'seaside') for the day - despite policies enhancing connectivity and transport throughout Merseyside, the Dee Estuary is on the outer fringes of this distance from Halton and there are other estuaries closer to Halton (e.g. Mersey, Ribble & Alt Estuaries) which residents are more likely to visit.
- 10.17 It is therefore concluded that there are no policies within Halton Core Strategy that are likely to lead to significant effects on the Dee Estuary SPA/Ramsar/SAC as a result of recreational pressure. Disturbance impacts due to development in other Merseyside authorities (particularly Wirral), Cheshire West & Chester and North Wales are likely to be more relevant to this SAC/SPA/Ramsar site.
- 10.18 It is conceivable that an increase in flights from Liverpool John Lennon Airport may result in increased disturbance of SPA waterfowl (both from aircraft noise and lighting) given that aircraft taking off from the airport routinely cross the Dee Estuary as well as the Mersey. At this stage it is not possible to evaluate these impacts in detail although the risk is clearly considerably lower than that for the Mersey Estuary SPA/Ramsar site and current noise contours as reported within the Masterplan indicate that noise levels will be similar to background levels at distances closer to the airport than the Dee Estuary SPA.

Recommendation for amendment to policy

- 10.19 **Policy CS16** of the Halton Core Strategy does state that *'negative environmental and social issues associated with the operation and expansion of JLA should be satisfactorily addressed including measures to reduce or alleviate the impacts on the natural and built environment, including areas of international, national or local conservation, ecological and landscape value'*. Provided this is amended in line with recommendations in Chapter 5 (i.e. adding: *'With respect to internationally important sites such measures will need to be sufficiently extensive to enable a conclusion of no adverse effect on integrity unless it can be demonstrated that there are both no alternatives and Imperative Reasons of Over-riding Public Interest'*) the Core Strategy will contain adequate policy protection to ensure that no adverse effect occurs.

Water quality

Appropriate Assessment

- 10.20 The Dee Estuary SAC designation covers not only the Dee Estuary proper but also the North Wirral Foreshore. There are therefore similar possible water quality impacts on the SAC as there are on the Mersey Narrows and North Wirral Foreshore pSPA/pRamsar site (see Chapter 5). It is therefore possible that any changes in water quality. It should be noted, however that any deterioration in water quality arising from Liverpool Core Strategy, particularly when considered in combination with the Halton and Wirral Core Strategies within Merseyside, as well as the Warrington Core Strategy in Cheshire.

Recommendations for amendment to policy

- 10.21 The recommendations given in Chapter 5 for addressing water quality and dredging/port development related impacts with regard to the Mersey Estuary SPA/Ramsar site would also serve for Dee Estuary SAC/SPA/pRamsar site.

Air quality

Appropriate Assessment

- 10.22 The extension of Liverpool John Lennon Airport may increase sulphur dioxide emissions in the vicinity of the SAC/SPA/Ramsar site. However, reference to APIS⁷⁵ indicates that the actual SO₂ concentration in the SAC/SPA/Ramsar site is well below the critical level (according to APIS the concentration⁷⁶ is 1.0 µgm⁻³ compared to a critical level for damage of 20 µgm⁻³). Similarly, the current level of nitrogen deposition for the same point is 10.5 kgN/ha/yr compared to a minimum critical load for sublittoral sediment of 20 kgN/ha/yr or for saltmarsh of 30 kgN/ha/yr. It is highly unlikely that the expansion of Liverpool John Lennon Airport would increase nitrogen deposition or sulphur dioxide concentrations to such a degree that it would cause exceedence of the critical level/load, even when considered within the context of the expansions of the ports of Liverpool and Garston.
- 10.23 Based on this information it is concluded that the Halton Core Strategy is unlikely to result in significant adverse effects on the integrity of the Dee Estuary SAC/SPA/Ramsar site due to deterioration in air quality. Therefore, no mitigation is recommended.

Water resources

Appropriate Assessment

- 10.24 The adopted United Utilities Water Resource Management Plan (September 2009) indicates that the water available for use in the Integrated Resource Zone is expected to reduce by 24.8 Ml/d between 2009/10 and 2014/15. Without water efficiency measures or new resources the initial supply demand balance for the Integrated Resource Zone is calculated to be in deficit by 8 Ml/day by 2024/25.
- 10.25 However, from reading the Water Resource Management Plan it does appear that abstraction from the Dee or any other European sites beyond the current licensed volumes is not part of United Utilities' intended future supply strategy⁷⁷, which rather depends on a mixture of demand management and increased abstraction from groundwater as follows:
- Construction of a bi-directional pipeline, known as the "West-to-East Link", between Merseyside and North Manchester. It is due to be in operation by 2012. This will help United Utilities maintain adequate supplies to Greater Manchester and Merseyside if there is a need

⁷⁵ Air Pollution Information System <http://www.apis.ac.uk/>

⁷⁶ For grid reference SJ236825

⁷⁷ Mark Smith of United Utilities North & Central Area Water Asset Management Team confirmed in a personal communication on 27/07/09 that abstraction from the Dee will not exceed the current licensed volume. The current licensed volume was subject to the Environment Agency's Review of Consents process and no reductions were considered necessary. It can therefore be concluded that no adverse effects on the integrity of the River Dee (either alone or 'in combination') will result from the United Utilities abstraction

to temporarily reduce supply from a major reservoir, for example due to maintenance work or drought conditions;

- Maintain current leakage levels;
- Help customers save 9 MI/d by 2014/15 (increasing later on to 12 MI/d), through a base service water efficiency programme;
- Achieve a water demand reduction of 10 MI/d in a dry year by 2014/15 (increasing to 22 MI/d by 2034/35) as a result of the expected scale of voluntary metering of households; and
- Non-household customers in the Integrated Zone are expected to reduce water demand by 87 MI/d by 2014/15 (141 MI/d by 2034/35) due to the effects of the economic downturn and as part of their continuing water efficiency programmes.

10.26 United Utilities enhanced plans identified as part of their economic programme to maintain adequate supply-demand balances are:

- Further reducing leakage by 23 MI/d by 2034/35.
- A programme of economic water efficiency measures to save 4 MI/d by 2034/35; and
- Implementing water source enhancements of 48 MI/d by 2034/35⁷⁸.

Conclusion

10.27 It is concluded that since no increased abstraction from European sites will be required in order to service new development in Halton (or elsewhere within the Integrated Supply Zone) that significant effects on the Dee Estuary SAC, SPA or Ramsar site can be screened out as unlikely. Risk of abstraction at inappropriate times of the year (such as periods of low flow) will be prevented by the Environment Agency's licensing regime and Review of Consents process.

10.28 It is also concluded that since Halton is located sufficiently far from the Dee Estuary that any change in either the size of the population of Halton or its demographic makeup is unlikely to lead to a significant effect on the Dee Estuary SAC/SPA/Ramsar site as a result of recreational pressure since while a small proportion of Halton residents may visit the Dee Estuary on occasion, their contribution when considered within the context of the other authorities that lie closer to the Estuary is likely to be effectively inconsequential.

⁷⁸ Widnes groundwater (22.7 MI/d), Southport groundwater (22.5 MI/d) and Oldham groundwater (2.5 MI/d)

11 Manchester Mosses SAC

Introduction

- 11.1 Figure 3 shows the location of Manchester Mosses SAC, located between 10-20km from Halton Borough.
- 11.2 Manchester Mosses SAC comprises Astley and Bedford Mosses, Holcroft Moss and Risley Moss, totalling approximately 173ha. The site is significant for mossland that *'formerly covered a very large part of low-lying Greater Manchester, Merseyside and southern Lancashire, and provided a severe obstacle to industrial and agricultural expansion'*. These sites are examples that have survived as degraded raised bog on the Mersey floodplain, with their surfaces elevated above surrounding land due to shrinkage of the surrounding tilled land, and *'all except Holcroft Moss have been cut for peat at some time in the past'*.

Reasons for Designation

- 11.3 Manchester Mosses SAC is designated for its Habitats Directive Annex I habitat of *'degraded raised bogs still capable of natural regeneration'* (EC, 1992).

Historic Trends and Current Pressures

- 11.4 As discussed above, the Manchester Mosses SAC is a direct result of historical loss of mossland (i.e. bog) habitat due to drainage for agriculture and built development. Mossland is reported to have been a significant obstacle to industrialisation of the area around Manchester, and its drainage and landfilling was intensified during the 19th and 20th centuries. However, recent rehabilitation management over the past 15-20 years has increased peat-producing *Sphagnum* species.
- 11.5 Laxen and Wilson (2002) suggests that NO₂ emissions from motorways essentially reach background levels within 200m of the roadside. Air pollution at many European sites is already believed to be having an adverse effect. Tables 5 and 6 show the degree to which Manchester Mosses SAC is affected by atmospheric nitrogen deposition (data downloaded from APIS on 28/04/10).

Table 6: Atmospheric nitrogen deposition compared with critical load at Holcroft Moss*

Site	Grid reference	Habitat	Minimum critical Load / Kg N/ha/year	Nitrogen Deposition/ Kg N/ha/ year	Exceedance	Is atmospheric nitrogen deposition currently a problem?
Manchester Mosses SAC (Holcroft Moss)	SJ683928	Raised and blanket bogs	5	23.5	Current deposition is more than four times the minimum critical load.	Yes

Source: Based on information provided by the UK Air Pollution Information System (www.apis.ac.uk). Data downloaded from APIS on 28/04/10

* the closest part of Manchester Mosses SAC to the M62

Table 7: Atmospheric sulphur dioxide concentrations compared with critical load at Holcroft Moss

Site	Grid reference	Habitat	Critical Level / $\mu\text{g}/\text{m}^3$	SO ₂ Concentration / $\mu\text{g}/\text{m}^3$	Exceedance	Is sulphur dioxide currently a problem?
Manchester Mosses SAC (Holcroft Moss)	SJ683928	Raised and blanket bogs	20	.8	Current concentration is 25% of the critical level.	No

Source: Based on information provided by the UK Air Pollution Information System (www.apis.ac.uk). Data downloaded from APIS on 28/04/10

11.6 Nevertheless, it is clear from Table 6 that nitrogen deposition is already a problem within Manchester Mosses SAC and it is not unreasonable to attribute this to the proximity of Holcroft Moss to the M62. Indeed, Environment Agency modelling data suggest that 40% of the nitrogen deposited on this site arises from road transport. In contrast, the site is not suffering from sulphur dioxide deposition, presumably because road traffic contributes very little to atmospheric concentrations of sulphur dioxide.

11.7 The environmental pressures upon the mossland habitat for which this site is designated are mainly:

- atmospheric nitrogen deposition from road traffic;
- increased agricultural drainage in the surrounding land, which causes the habitat to dry out and begin succession towards scrubland and woodland (including drainage of peat that gradually increases a downward gradient away from the mosslands);
- changes to the maintenance regime of nearby agricultural drainage, which can cause either drying out through unsympathetic dredging, or waterlogging through complete lack of dredging;
- increased water abstraction for irrigation, which can contribute towards the drying out of mossland habitat through reduced flows and/or a lowered water table;
- afforestation as a result of natural succession;
- fly-tipping;
- loss of neighbouring mossland habitat as a result of agricultural drainage or drainage and landfill for development;
- loss of neighbouring peat and mossland habitat as a result of peat harvesting, both legally and illegally;
- damage to mossland habitat due to increased recreational pressure (e.g. paintball); and
- loss of *Sphagnum* species as a result of drying out and increased air pollution.

Key potential pressures from Halton

11.8 From the environmental requirements that have been identified above it can be determined that the following impacts of development could interfere with the above environmental requirements and processes on the SAC:

- Deterioration in local air quality and thus increased nitrogen deposition.

Appropriate Assessment

11.9 North Halton is located immediately south of the M62, 18km west of Manchester Mosses SAC. It is possible that development in Halton (e.g. the Mersey Gateway Bridge (CS15), 3MG (CS6), commercial development (CS3), new housing (CS2), associated infrastructure provision (CS5)) has the potential to result in an increase in vehicle movements using the M62, and therefore contribute to an increase in atmospheric nitrogen deposition into the SAC. The M62 is located approximately 5km north of the River Mersey, and runs parallel to it without any crossing. The Mersey Gateway Bridge is therefore unlikely to result in a significant increase in M62 vehicle movements compared to other roads serving the Borough. It would be more appropriate to consider these likely significant effects as an 'in combination effect' with other plans and projects that may contribute to greater vehicle traffic on the M62.

11.10 Under current plans, approximately 80,460 new dwellings and at least 1,440 ha of commercial development will be delivered across the Merseyside area over the next 20 years (including the 8,000 dwellings to be delivered in Halton). Given the key role of the M62 as one of the major entry/exit routes to Merseyside from the Midlands and the North, it is reasonable to assume that a significant cumulative 'in combination' air quality effect as a result of the cumulative increase in vehicle emissions is not unlikely.

11.11 There are several policies which would serve to protect the SAC either directly or through promoting and delivering Sustainable Transport & Travel (**policy CSxx**):

- Directing significant development, which generates a large number of trips, into sustainable locations in accordance with Halton's spatial strategy;
- Ensuring all development is well connected and achieves high levels of accessibility including satisfactory access by bus, rail, walking and cycling;
- Requiring the production of Travel Plans and Transport Assessments, in association with major new developments and in accordance with national guidance.
- Setting maximum parking standards to deter use of the private car.
- To support sustainable transport across the Borough, improvements to the existing network and the introduction of new sustainable routes and facilities will be encouraged including:
 - A cross-river sustainable transport route prioritising public transport, walking and cycling on the Silver Jubilee Bridge in association with the Mersey Gateway Project
 - Increased use of the Halton Curve rail route (South-West Runcorn)
 - Park and ride facilities in appropriate locations

- Reinstated or new railway stations
- An improved rail station in central Widnes
- Pedestrian and cycling routes and facilities especially in association with the Key Areas of Change
- Capacity for innovative transport technology, including the use of alternative fuels

11.12 Moreover, the supporting text for this policy specifically address cross-boundary issues: *'In addition to the above it is also imperative that the cross-boundary nature of travel is recognised and where appropriate opportunities are taken to ensure that public transport, walking and cycling routes are integrated across boundaries. Working with neighbouring authorities will be supported in order to achieve sustainable cross boundary accessibility particularly in conjunction with the Liverpool City Region'*.

11.13 Based on this information it is concluded that the Halton Core Strategy does provide a system of measures to minimise the contribution to any increase in nitrogen deposition within Manchester Mosses SAC. However, one further amendment to policy is recommended.

Recommendations for amendment to policy

11.14 The only further measure that we would recommend for inclusion in policy is to make it clear that since the Manchester Mosses SAC is already exceeding its critical load any project/development within the Borough which would increase nitrogen inputs into the SAC by more than 1% will require a project level Appropriate Assessment. This will include traffic movements associated with housing. In order to avoid placing an unnecessary burden on small scale housing development proposals it may be appropriate to restrict this requirement to developments of more than 50 dwellings.

Conclusion

11.15 The provision of these policies demonstrates that the Core Strategy does already include proportionate measures to minimise its contribution to vehicle movements on the M62 and therefore contains an adequate policy framework to enable Halton to reduce its atmospheric nitrogen deposition on Manchester Mosses SAC from Core Strategy development to a level that is effectively inconsequential.

12 Oak Mere SAC

Introduction

- 12.1 Figure 3 shows the location of Oak Mere SAC in Cheshire, which is approximately 12km south of the Halton Borough and which is also part of the Midland Meres & Mosses Phase 2 Ramsar site.
- 12.2 Oak Mere covers an area of 68.82ha. This site consists of a large water body formed in a kettle-hole in the fluvio-glacial sands of the Cheshire Plain. The lake has low nutrient levels typical of oligotrophic waters containing few minerals of sandy plains (*Littorelletalia uniflorae*) and has a marginal zone of shoreweed (*Littorella uniflora*). The lake also has floating rafts of bog-moss (*Sphagnum* spp.) and narrow small-reed (*Calamagrostis stricta*) which are now rare in the lowlands of England. There are also transition areas at the waters edge which contain, soft rush (*Juncus effusus*), spike-rush (*Eleocharis palustris*), marsh pennywort (*Hydrocotyle vulgaris*) and water horsetail (*Equisetum fluviatile*). The small depressions in the peat contain bottle sedge (*Carex rostrata*), cross-leaved heath (*Erica tetralix*) and round-leaved sundew (*Drosera rotundifolia*).

Reasons for Designation

- 12.3 The primary reason for selection of this site is the presence of Habitats Directive Annex I habitats (EC 1992c) of oligotrophic waters containing few minerals of sandy plains (*Littorelletalia uniflorae*) and transition mires and quaking bogs.

Historic Trends and Existing Pressures

- 12.4 The nutrient-poor water of Oak Mere has already been shown to be highly sensitive to several sources of enrichment. There are potential threats of further nutrient enrichment and chemical pollution at times of high water table, via discharges into the Mere's surface inflow. The risks from these point sources are being investigated by Natural England and the Environment Agency. There is also a continual risk of accidents and spillages from the busy transport network at the sides of the Mere.
- 12.5 The Mere has reduced in size due to a natural lowering in the local water table caused by successive droughts. The water-level changes are also being monitored and managed to minimise the threat to shoreline communities from desiccation and invasion by birch and willow.
- 12.6 Table 8 indicates that atmospheric nitrogen deposition is already exceeding the critical load by almost three times. A review of the sources of nitrogen deposition (www.apis.ac.uk) indicates that an overwhelming majority (52%) arises from livestock emissions. Road traffic emissions are estimated to contribute to 6% of the nitrogen deposition at Oak Mere SAC. In contrast, the site is not suffering from sulphur dioxide deposition, presumably because road traffic contributes very little to atmospheric concentrations of sulphur dioxide.

Table 8: Atmospheric nitrogen deposition compared with critical load at Oak Mere*

Site	Grid reference	Habitat	Minimum critical Load / Kg N/ha/year	Nitrogen Deposition/ Kg N/ha/ year	Exceedance	Is atmospheric nitrogen deposition currently a problem?
Oak Mere SAC	SJ573679	Oligotrophic waters	5	13.2	Current deposition is almost four times the minimum critical load.	Yes

Source: Based on information provided by the UK Air Pollution Information System (www.apis.ac.uk). Data downloaded from APIS on 09/07/10

Table 9: Atmospheric sulphur deposition compared with critical load at Oak Mere*

Site	Grid reference	Habitat	Critical Level / $\mu\text{g}/\text{m}^3$	SO ₂ Concentration / $\mu\text{g}/\text{m}^3$	Exceedance	Is atmospheric nitrogen deposition currently a problem?
Oak Mere SAC	SJ573679	Oligotrophic waters	20	1.2	Current concentration is 6% of the critical level.	No

Source: Based on information provided by the UK Air Pollution Information System (www.apis.ac.uk). Data downloaded from APIS on 09/07/10

Key Potential Pressures from Halton

12.7 Oak Mere SAC is located immediately adjacent to the A54 and A49, both of which are busy roads within Cheshire. From the environmental requirements that have been identified above it can be determined that the following impacts of development could interfere with the above environmental requirements and processes on the SAC:

- deterioration in local air quality and thus increased nitrogen deposition

Likely Significant Effects of the Core Strategy

12.8 While it is possible that some development in Halton (e.g. the Mersey Gateway Bridge (CS15), 3MG (CS6), commercial development (CS3), new housing (CS2) and associated infrastructure provision (CS5)) has the potential to contribute to traffic flows on the A54 and A49 neither are key routes for traffic movements into and out of Halton, even from Cheshire West & Chester (the M56 being a far more significant route). As such, and given the distance between Halton and Oak Mere SAC (10km) it is considered reasonable to conclude that any contribution of Halton to traffic movements is effectively inconsequential when compared to that arising from Cheshire West & Chester and parts of north Wales.

Likely Significant Effects of Other Projects and Plans

12.9 A total of 17,955 homes are to be provided in Cheshire West and Chester by 2021 which are directly served by the A54 and A556. It is reasonable to assume that a significant cumulative 'in combination' air quality and water quality effect as a result of the cumulative increase in vehicle emissions is not unlikely. However, it would be a matter for the Cheshire West and Chester Core Strategy to take any steps necessary to mitigate any effect.

Conclusion

- 12.10 It can be concluded that the Halton Core Strategy is unlikely to lead to significant adverse effects upon Oak Mere SAC.

13 River Dee and Bala Lake SAC

Reasons for Designation

13.1 The River Dee and Bala Lake qualifies as an SAC for both habitats and species. Firstly, the site contains the following Habitats Directive Annex I habitats:

- Water courses of plain to montane levels with the *Ranunculus fluitantis* and *Callitriche-Batrachion* vegetation

13.2 Secondly, the site contains the following Habitats Directive Annex II species:

- Atlantic salmon *Salmo salar*
- Floating water-plantain *Luronium natans*
- Sea lamprey *Petromyzon marinus*
- Brook lamprey *Lampetra planeri*
- River lamprey *Lampetra fluviatilis*
- Bullhead *Cottus gobio*
- Otter *Lutra lutra*

13.3 The historic trends and current pressures on the site are summarised below.

Historic Trends and Current Pressures

13.4 The habitats and species for which the site is designated are dependent on the maintenance of good water quality and suitable flow conditions. Fish species require suitable in-stream habitat and an unobstructed migration route. Otters also require suitable terrestrial habitat to provide cover and adequate populations of prey species. The site and its features have been historically threatened by practices which had an adverse effect on the quality, quantity and pattern of water flows, such as inappropriate flow regulation, excessive abstraction, deteriorating water quality from direct and diffuse pollution, eutrophication and siltation. Degradation of riparian habitats due to engineering works, agricultural practices and invasive plant species have also had localised adverse effects in the past. The Atlantic salmon population has been threatened by excessive exploitation by high sea, estuarine and recreational fisheries. Introduction of non-indigenous species has also been a risk to both fish and plant species.

13.5 The environmental pressures upon the River Dee & Bala Lake SAC are mainly:

- Deterioration in water quality and changes in flow rates due to ex-industrial runoff, discharge of treated sewage effluent (which contains elevated nitrates) and agricultural runoff;
- Risk of excessive abstraction resulting in a decrease in freshwater flows and an increase in sediment loading of water such that dehydration of interest features may occur;
- Overfishing of Atlantic salmon; and

- Introduction of invasive species.

Key potential pressures from Halton

- 13.6 From the environmental requirements that have been identified above it can be determined that the following impacts of development requires investigation, since if it occurred it could interfere with the above environmental requirements and processes on the SAC:
- Damaging levels of abstraction to supply housing in Halton when considered in combination with development elsewhere in United Utilities Integrated Resource Zone and development outside the zone that will receive water from the same sources (e.g. abstraction from the River Dee in relation to development in North Wales).

Likely Significant Effects of the Core Strategy (in combination)

- 13.7 Due to the integrated nature of water supply across Greater Manchester and Merseyside it is not possible or necessary to consider the impacts of the Halton Core Strategy in isolation since the situation does not arise; all impacts will be 'in combination'. These are described in the table below, against each potential impact.

Aspect of the Core Strategy	Water resource issues
<p>Delivery of 8,000 new dwellings across Halton (2003-2026) (mainly through urban intensification until 2018). After 2018 development may involve greenbelt release.</p> <p>Economic development – 289 hectares of land will be made available (2010-2026) from a variety of sources for employment purposes (Policy CS3), and existing economic development enhanced (CS13). Development focus within 'key areas of change' (CS7-CS9)</p>	<p>The adopted United Utilities Water Resource Management Plan (September 2009) indicates that the water available for use in the Integrated Resource Zone is expected to reduce by 24.8 MI/d between 2009/10 and 2014/15. Without water efficiency measures or new resources the initial supply demand balance for the Integrated Resource Zone is calculated to be in deficit by 8 MI/day by 2024/25.</p> <p>However, from reading the Water Resource Management Plan it does appear that abstraction from the Dee or any other European sites beyond the current licensed volumes is not part of United Utilities' intended future supply strategy⁷⁹, which rather depends on a mixture of demand management and increased abstraction from groundwater as follows:</p> <ol style="list-style-type: none"> 1. Construction of a bi-directional pipeline, known as the "West-to-East Link", between Merseyside and North Manchester. It is due to be in operation by 2012. This will help United Utilities maintain adequate supplies to Greater Manchester and Merseyside if there is a need to temporarily reduce supply from a major reservoir, for example due to maintenance work or drought

⁷⁹ Mark Smith of United Utilities North & Central Area Water Asset Management Team confirmed in a personal communication on 27/07/09 that abstraction from the Dee will not exceed the current licensed volume. The current licensed volume was subject to the Environment Agency's Review of Consents process and no reductions were considered necessary. It can therefore be concluded that no adverse effects on the River Dee (either alone or 'in combination') will result from the United Utilities abstraction.

Aspect of the Core Strategy	Water resource issues
	<p>conditions.</p> <ol style="list-style-type: none">2. Maintain current leakage levels.3. Help customers save 9 MI/d by 2014/15 (increasing later on to 12 MI/d), through a base service water efficiency programme.4. Achieve a water demand reduction of 10 MI/d in a dry year by 2014/15 (increasing to 22 MI/d by 2034/35) as a result of the expected scale of voluntary metering of households.5. Non-household customers in the Integrated Zone are expected to reduce water demand by 87 MI/d by 2014/15 (141 MI/d by 2034/35) due to the effects of the economic downturn and as part of their continuing water efficiency programmes. <p>United Utilities enhanced plans identified as part of their economic programme to maintain adequate supply-demand balances are:</p> <ol style="list-style-type: none">1. Further reducing leakage by 23 MI/d by 2034/35.2. A programme of economic water efficiency measures to save 4 MI/d by 2034/35.3. Implementing water source enhancements of 48 MI/d by 2034/35⁸⁰

Conclusion

- 13.8 It is concluded that since no increased abstraction from European sites will be required in order to service new development in Halton (or elsewhere within the Integrated Supply Zone) that significant effects on the River Dee & Bala Lake SAC can be screened out as unlikely. Risk of abstraction at inappropriate times of the year (such as periods of low flow) will be prevented by the Environment Agency's licensing regime and Review of Consents process.

⁸⁰ Widnes groundwater (22.7 MI/d), Southport groundwater (22.5 MI/d) and Oldham groundwater (2.5 MI/d)

14 River Eden SAC

Reasons for Designation

14.1 The River Eden in the Lake District qualifies as an SAC for both habitats and species. Firstly, the site contains the following Habitats Directive Annex I habitats:

- Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoëto-Nanojuncetea*
- Watercourses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
- Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Alno-Padion, Alnion incanae, Salicion albae)

14.2 Secondly, the site contains the following Habitats Directive Annex II species:

- White-clawed crayfish *Austropotamobius pallipes*
- Sea lamprey *Petromyzon marinus*
- Brook lamprey *Lampetra planeri*
- River lamprey *Lampetra fluviatilis*
- Atlantic salmon *Salmo salar*
- Bullhead *Cottus gobio*
- Otter *Lutra lutra*

14.3 The historic trends and current pressures on the site are summarised below.

Historic Trends and Current Pressures

14.4 The maintenance of breeding and nursery areas for the species on this site depends on the habitat quality of streams and their margins. Many of the streams within the site suffer from overgrazing of riverbanks and nutrient run-off. This is being addressed by a number of measures, including a conservation strategy with actions to address river quality issues, and a partnership approach to funding habitat improvements. The water-crowfoot communities as well as the species are sensitive to water quality, particularly eutrophication.

14.5 Practices associated with sheep-dipping pose a potential threat at this site, and are currently under investigation. Much of the alluvial forest cover is fragmented and/or in poor condition. It is hoped to address this through management agreements or Woodland Grant Schemes with individual owners.

14.6 The habitats and species for which the site is designated are dependent on the maintenance of good water quality and suitable flow conditions. Fish species require suitable in-stream habitat and an unobstructed migration route. Otters also require suitable terrestrial habitat to provide

cover and adequate populations of prey species. The site and its features have been historically threatened by practices which had an adverse effect on the quality, quantity and pattern of water flows, such as inappropriate flow regulation, excessive abstraction, deteriorating water quality from direct and diffuse pollution, eutrophication and siltation. Degradation of riparian habitats due to engineering works, agricultural practices and invasive plant species have also had localised adverse effects in the past. The Atlantic salmon population has been threatened by excessive exploitation by high sea, estuarine and recreational fisheries. Introduction of non-indigenous species has also been a risk to both fish and plant species.

14.7 The environmental pressures upon the River Eden SAC are mainly:

- Deterioration in water quality and changes in flow rates due to agricultural runoff and discharge of treated sewage effluent (which contains elevated nitrates);
- Risk of excessive abstraction resulting in a decrease in freshwater flows and an increase in sediment loading of water such that dehydration of interest features may occur;
- Overfishing; and
- Introduction of invasive species.

Key potential pressures from Halton

14.8 Traditionally, the water supply for Merseyside comes from the River Dee and Welsh sources, while that for Greater Manchester comes from the Lake District (particularly Haweswater which is within the catchment of the River Eden). The new west-east link main will enable greater flexibility of supply such that there will no longer be a strong split between water sources.

14.9 From the environmental requirements that have been identified above it can be determined that the following impacts of development could interfere with the above environmental requirements and processes on the SAC:

- Damaging levels of abstraction to supply housing in Halton when considered in combination with development elsewhere in United Utilities Integrated Resource Zone and development outside the zone that will receive water from the same sources (e.g. abstraction from Haweswater in relation to development in Cumbria).

Likely Significant Effects of the Core Strategy (in combination)

14.10 Due to the integrated nature of water supply across Greater Manchester and Merseyside it is not possible or necessary to consider the impacts of the Halton Core Strategy in isolation since the situation does not arise; all impacts will be 'in combination'. These are described in the table below, against each potential impact.

Aspect of the Core Strategy	Water resource issues
<p>Delivery of 8,000 new dwellings across Halton (2003-2026) (mainly through urban intensification until 2018). After 2018 development may involve greenbelt release</p> <p>Economic development – 289 hectares of land will be made available (2010-2026) from a variety of sources for employment purposes (Policy CS3), and existing economic development enhanced (CS13). Development focus within 'key areas of change' (CS7-CS9)</p>	<p>The most recent draft United Utilities Water Resource Management Plan (January 2009) indicates that the water available for use in the Integrated Resource Zone is expected to reduce by 24.8 Ml/d between 2009/10 and 2014/15. Without water efficiency measures or new resources the initial supply demand balance for the Integrated Resource Zone is calculated to be in deficit by 8 Ml/day by 2024/25.</p> <p>However, it has been confirmed by United Utilities that one of the main reasons for the existence of the new west-east link is in response to expected reductions in the licensed abstractions from Haweswater and other Lake District sources resulting from the Environment Agency's Review of Consents process. As such, abstraction from these sources is already being revised to ensure no adverse effect on the River Eden SAC or other sensitive sites in the Lake District.</p>

Conclusion

- 14.11 It is concluded that since no increased abstraction from the River Eden SAC will be required in order to service new development in Halton (or elsewhere within the Integrated Supply Zone) significant effects can be screened out as unlikely.

15 Martin Mere SPA and Ramsar

Introduction

- 15.1 Martin Mere SPA and Ramsar site (119.89 ha) is located north of Ormskirk in West Lancashire, north west England, approximately 20km north of Halton. However, the outstanding importance of Martin Mere is as a refuge for its large and diverse wintering, passage and breeding bird community.
- 15.2 It occupies part of a former lake and mire that extended over some 1,300 ha of the Lancashire Coastal Plain during the 17th century. In 1972 the Wildfowl and Wetlands Trust purchased 147 hectares of the former Holcrofts Farm, consisting mainly of rough damp pasture, with the primary aim of providing grazing and roosting opportunities for wildfowl. Since acquisition the rough grazed pastures have been transformed by means of positive management into a wildfowl refuge of international importance. Areas of open water with associated muddy margins have been created, whilst maintaining seasonally flooded marsh and reed swamp habitats via water level control. In September 2002, an additional 63 hectares of land were purchased on the southern most part of the refuge at Woodend Farm, with the aid of the Heritage Lottery Fund, to restore arable land to a variety of wetland habitats including seasonally flooded grassland, reedbed, wet woodland and open water habitats.
- 15.3 The complex now comprises open water, seasonally flooded marsh and damp, neutral hay meadows overlying deep peat. It includes a wildfowl refuge of international importance, with a large and diverse wintering, passage and breeding bird community. In particular, there are significant wintering populations of Bewick's swan (*Cygnus columbianus bewickii*) and whooper swan (*Cygnus Cygnus*), pink-footed goose (*Anser brachyrhynchus*) and pintail (*Anas acuta*). There is considerable movement of wintering birds between this site and the nearby Ribble and Alt Estuaries SPA.

Reasons for Designation

- 15.4 This site qualifies for SPA under Article 4.1 of the Directive (79/409/EEC) by supporting populations of European importance of the following over wintering birds listed on Annex I of the Directive:
- Bewick's swan, 449 individuals representing at least 6.4% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6);
 - whooper swan 621 individuals representing at least 11.3% of the wintering population in Great Britain (5 year peak mean 1991/2 - 1995/6)
- 15.5 This site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following over wintering migratory species:
- pink-footed goose, 25,779 individuals representing at least 11.5% of the wintering Eastern Greenland/Iceland/UK population (5 year peak mean 1991/2 - 1995/6)

- pintail 978 individuals representing at least 1.6% of the wintering North western Europe population (5 year peak mean 1991/2 - 1995/6)

15.6 The assemblage of birds present makes the site a wetland of international importance. The area qualifies under Article 4.2 of the Directive (79/409/EEC) by regularly supporting at least 20,000 waterfowl. Over winter, the area regularly supports 46,196 individual waterfowl (5 year peak mean 1991/2 - 1995/6) including: pochard (*Aythya farina*), mallard (*Anas platyrhynchos*), teal (*Anas crecca*), wigeon (*Anas penelope*), pintail pink-footed goose (*Anser brachyrhynchus*), whooper swan, and bewick's swan.

15.7 It is additionally designated as a Ramsar site in accordance with Criterion 5 (UN, 2005) for supporting up to 25,306 waterfowl (5-year peak mean 1998/99 – 2002/03) in winter, and in accordance with Criterion 6 for supporting internationally important populations of pink-footed goose *Anser brachyrhynchus*, Bewick's swan *Cygnus columbianus* ssp. *bewickii*, whooper swan *Cygnus cygnus*, Eurasian wigeon *Anas penelope* and northern pintail *Anas acuta*.

Historic Trends and Existing Pressures

15.8 Since the site's designation as a Wetland of International Importance under the Ramsar Convention and as a Special Protection Area in 1985 there has been a gradual increase in the usage of the mere by certain species of wildfowl and wading birds as a direct consequence of positive management. The site is geared towards attracting visitors, with a number of hides from which the Mere and its birds may be viewed. In addition to the wild species for which it is designated, the site holds a collection of about 1,500 captive birds of 125 species from around the world, as well as a number of other visitor attractions. This is because the site is a Wildfowl and Wetlands Trust reserve.

15.9 The environmental pressures experienced by Martin Mere in terms of its bird community are likely to be those common to all reedbed habitat. The refuge is vulnerable to the following:

- direct loss of characteristic species as a result of nutrient enrichment from agricultural fertilisers and run-off;
- loss of reedbed due to weakening of stems through poor growth conditions;
- natural succession to woodland through lack of active management;
- changes in farming practice. grazing management is largely dependent upon cattle from surrounding farms;
- reduced water level by surface and ground water abstractions or agricultural drainage, which causes the habitat to dry out and begin succession towards 'alder/willow carr woodland, hastening the overall process of succession towards broadleaved woodland' (Lancashire BAP);
- removal of reeds and other vegetation from whole stretches of watercourses (e.g. neighbouring the site) through routine management of ditches and riverbanks (in some instances);
- erosion of reedbeds due to increased recreational use of waterbodies and waterways (notably canals);

- habitat loss or degradation due to the isolation of reedbeds as a result of losses elsewhere, in turn due to the above or other factors (Lancashire BAP).

15.10 In addition, the following pressures have been documented :

- invasive plant species: Regular herbicide control of trifid burr marigold is necessary in order to prevent this plant from invading lake/scape margins to the detriment of bird populations;
- water borne disease that could affect wildfowl: water levels on the Mere are controlled to maintain optimum levels throughout the winter period, then lowered progressively in summer to expose marginal mud and the underlying damp pastures and maintain a mosaic of shallow pools. Ditches are regularly cut and dredged and all areas of pasture are positively managed under a Countryside Stewardship Scheme. Nutrients brought in with the water supply from the surrounding arable farmland and inadequate sewage treatment adds considerably to the large deposits of guano from wintering waterfowl. This results in the refuge being highly eutrophic with extremely poor water quality conditions and creates the possible risk of water borne diseases which could affect waterfowl, although no such outbreaks have been recorded. The Wildlife Trust have started to address this issue with the creation of reedbed water filtration systems and a series of settlement lagoons helps to reduce suspended solids of effluent water arising from waterfowl areas
- due to the eutrophication (described above) Martin Mere is also experiencing water quality issues.

Key Pressures from Halton

15.11 The only potential pathway in which development within Halton could lead to effects on Martin Mere SPA and Ramsar sites is through development of wind turbines, depending on the location of the turbines and flight paths of qualifying bird species at Martin Mere.

Likely Significant Effects of the Core Strategy

15.12 Halton is located approximately 20km south of Martin Mere SPA and Ramsar site. It is possible that the construction of wind turbines (both onshore and offshore) within Merseyside has the potential to displace the flight path of qualifying bird species, depending on their location. It would be more appropriate to consider these likely significant effects as an 'in combination effect' with other policies that may contribute to the construction of wind turbines in the region.

15.13 The Core Strategy promotes renewable and low carbon energy within Halton (policy **CS18**). HRA Screening identified that, should this include wind turbine construction, a pathway exists for the construction of onshore/offshore turbines to disrupt flight paths and displace qualifying bird species. Disturbance issues associated with maintenance activities were also identified. The policy states that subject to successful assessment and mitigation of impacts of development proposals, Halton would seek to direct proposals for grid-connected renewable energy infrastructure and equipment, including, but not limited to: wind, solar PV and biomass CHP, to the identified priority zone areas.

- 15.14 This policy is being informed by The Liverpool City Regional Renewable Energy Options⁸¹ which identifies three priority zone areas for wind energy, none of which are located within the Borough of Halton. It is therefore unlikely that the Policy **CS18** of the Halton Core Strategy will result in the development of wind turbines.

Likely Significant Effects of Other Projects and Plans

- 15.15 The Liverpool City Region Renewable Energy Study (ongoing) is identifying the location 'Wind Priority Zones'. It is reasonable to assume that a significant cumulative 'in combination' disturbance to qualifying bird species may arise, depending on the findings of this study and subsequent policy.

Conclusion

- 15.15.1 It can be concluded that Halton Core Strategy will not lead to adverse effects on Martin Mere SPA/Ramsar.

⁸¹ Arup (2001) Liverpool City Regional Renewable Energy Options Stage 2 (Drawing Title CHP/DH & Wind Priority Zones, Final Issue) (date 27/5/2010)

16 Summary of Appropriate Assessment

- 16.1 Although the Core Strategy was screened for likely significant effects upon River Dee & Bala Lake SAC, River Eden SAC, Oak Mere SAC, Martin Mere SAC and Sefton Coast SAC it was ultimately concluded that the Core Strategy was unlikely to lead to significant effects on these sites, even when considered in combination with other projects and plans.
- 16.2 The Core Strategy was screened in for Appropriate Assessment relating to likely significant effects 'in combination' with other projects and plans upon the following European sites: Mersey Estuary SPA/Ramsar Site, Liverpool Bay SPA/pRamsar, Mersey Narrows & North Wirral Foreshore pSPA/pRamsar, Dee Estuary SAC/SPA & Ramsar site, Ribble & Alt SPA/Ramsar and Manchester Mosses SAC.
- 16.3 The Appropriate Assessment identified the following impact pathways from the Halton Core Strategy to these European Sites, particularly when considered 'in combination' with other projects and plans:
- Mersey Estuary SPA/Ramsar Site - Disturbance to qualifying bird species (from recreational pressure and other sources), deterioration in water quality, impacts due to possible changes in sediment associated with shipping and loss of supporting habitat;
 - Liverpool Bay SPA/pRamsar, Mersey Narrows & North Wirral Foreshore pSPA/pRamsar, and Ribble & Alt SPA/Ramsar - Water quality effects 'in combination'; and
 - Manchester Mosses SAC - Air quality effects 'in combination'.
- 16.4 These effects will result from the following policies:
- Halton's Spatial Strategy CS1;
 - Housing Supply and Locational Priorities CS3;
 - Employment Land Supply and Locational Priorities CS3;
 - A Network of Centres for Halton CS4;
 - Infrastructure Provision CS5;
 - 3MG (Mersey Multimodal Gateway) CS6;
 - South Widnes CS7;
 - East Runcorn CS8;
 - West Runcorn CS9;
 - Minerals CS26;
 - Meeting the Needs of Gypsies, Travellers and Travelling Show People CS12;
 - The Mersey Gateway Project CS15;
 - Liverpool John Lennon Airport CS16; and
 - Sustainable Development and Climate Change CS18.

- 16.5 Recommendations for amendments to policy to enable the delivery of measures to avoid or adequately mitigate the adverse effects are set out below.

Disturbance

- 16.6 To ensure direct disturbance to qualifying bird species as a result of Policy CS12 (Meeting the Needs of Gypsies, Traveller and Travelling Show People) is avoided, additional text proposed: *'sites that would lead to adverse effects on the integrity of the Mersey Estuary SPA/Ramsar site would not be taken forward'*.
- 16.7 Additional wording is also recommended for Liverpool John Lennon Airport expansion (Policy CS16). Policy CS16 currently states that negative environmental and social issues associated with the operation and expansion of JLA should be satisfactorily addressed including measures to reduce or alleviate the impacts on the natural environment, including locally, nationally and internationally important sites. We would recommend adding: *'With respect to internationally important sites such measures will need to be sufficiently extensive to enable a conclusion of no adverse effect on integrity unless it can be demonstrated that there are both no alternatives and Imperative Reasons of Over-riding Public Interest'*. This would make clear the high standards that would need to be achieved in order for mitigation to be deemed acceptable.
- 16.8 **Policy CS25** 'Green Infrastructure' states with regarding to protecting and enhancing the green infrastructure network in the Borough that *'Halton Borough Council working alongside other partners and agencies responsible for the delivery and maintenance of green infrastructure will achieve this through ... sustaining the protection afforded to internationally important sites for biodiversity by managing recreational impacts and encouraging the use of the wider green infrastructure network which is less sensitive to recreational pressure'*. This specifically places management of the GI network within the context of sustaining the protection of European sites by directing recreational activity to less sensitive areas. However, it is considered that some amendments would be desirable.
- 16.9 Any strategy that follows on from this policy commitment will need to be sufficiently developed (or at least there will need to be a clear timescale for the introduction of such a strategy) by the time the Site Allocations DPD is adopted such that there is at least a funded mechanism to monitor recreational activity and trigger the introduction of enhanced management, since the delivery of enhanced access management and Green Infrastructure will need to be phased alongside delivery of housing. The contribution of each authority should be based upon their contribution to recreational activity in each site or (where this information is not yet available) their relative populations and proximity to the site. In general therefore the devising of such a strategy (whether it is part of a specific future SPD or not) will need to be well advanced by the time the Site Allocations DPD is adopted as some strategic greenspace and a possible contribution to funding access management may need to be associated with particular sites. It would be preferable for this to be mentioned in the Core Strategy policy or supporting text, or alternatively for the Core Strategy supporting text to cross-refer to this HRA report.
- 16.10 For the Mersey Estuary an appropriate detailed framework that encompasses the management of recreation may exist through a European Marine Site Management Scheme, which, if it follows the pattern of other EMS Management Schemes would include recreation/access management within its remit. If this does prove to be the case then the commitment given in the Green

Infrastructure policy cited above could be explicitly linked to a commitment to support and participate (financially as required) this Management Scheme, in conjunction with the other Merseyside authorities and stakeholders.

- 16.11 If the above recommendations to manage access are implemented, it is concluded that there will be no adverse effect on the integrity of the Mersey Estuary SPA/Ramsar through direct disturbance as a result of any of the policies proposed within the Core Strategy.

Water Quality

- 16.12 Policy CS23 (Protection from Risk and Pollution) states that proposals will be encouraged which ensure that development does not result in unacceptable levels of pollution (including air, odour, water, ground, noise and light) through its location, design, construction and operation. Avoiding an adverse effect is largely in the hands of the water companies (through their investment in future sewage treatment infrastructure) and Environment Agency (through their role in consenting effluent discharges). However, local authorities can also contribute through ensuring that sufficient wastewater treatment infrastructure is in place prior to development being delivered through the Core Strategy. In the case of Halton, this is alluded to in Policy CS15 (Infrastructure provision):

- 16.13 *“Development proposals will be supported by the timely provision of appropriate infrastructure including... physical/environmental e.g. water supply/treatment and energy supply...”*

- 16.14 However, it is considered that this allusion needs to be slightly expanded upon in order to provide a firm commitment with regard to the linking of housing delivery to delivery of necessary infrastructure that will ensure that an adverse effect on European sites is avoided. A policy in the Core Strategy will need to make specific reference to the fact that the delivery of development will be phased in order to ensure that it only takes place once any new water treatment infrastructure or appropriate retro-fitted technology (e.g. nitrate stripping) necessary to service the development while avoiding an adverse effect on European sites is in place. The Core Strategy should also indicate how this need will be determined and delivered through interaction with other authorities (United Utilities, the Environment Agency etc) i.e. through a Water Cycle Strategy.

Dock, port and channel construction, maintenance shipping and dredging

- 16.15 Policy CS22 (Protection from Risk and Pollution) already makes provision to ensure risk levels from existing installations or facilities with the potential to create major accidents are recognised and that development proposals for new or expanded installations that increase risk levels do not take place on such sites. The same policy also seeks to ensure that development does not result in unacceptable levels of pollution (including air, odour, water, ground, noise and light) through its location, design, construction and operation. Additionally policy CS6 (3MG) makes particular regards to respecting the Mersey Estuary SPA/Ramsar. It can therefore be demonstrated that the Core Strategy already includes inherent mitigation to avoid these potentially significant effects on the Mersey Estuary SPA/Ramsar.

- 16.16 However it is considered that a greater commitment to this is required to ensure the development of Docks and Ports within the Mersey Estuary, and any associated channel construction or dredging activity will be permitted subject only to the completion of a project based Appropriate Assessment. This would include a thorough consideration of impacts relating to construction (including potential disturbance of sediments and hydrodynamic modelling if required), operational impacts (including anticipated changes in boat traffic and associated impacts) with necessary mitigation in construction, design and management. This particularly applicable to policies CS7 (South Widnes); CS9 (West Runcorn) Mersey Gateway Port (3MG Western Docks) to be develop as multimodal facility using Manchester Ship canal, rail/road infrastructure (CS6).

Coastal Squeeze

- 16.17 The Core Strategy should prevent any development being delivered in areas that may exacerbate coastal squeeze. The policy should:
- Ensure that new development is not delivered in locations which would require a change in coastal defence policy that might compromise natural coastal processes (e.g. from No Active Intervention to Hold the Line or Advance the Line); and
 - Prevent development being delivered in areas that may compromise locations identified for managed retreat as set out in the Environment Agency Coastal Habitats Management Plan (CHaMP) and Regional Habitat Creation Programme.
- 16.18 In addition, to ensure that loss of supporting habitat for SPA waterfowl is considered in strategic planning the policy should ensure that:
- If habitat which is suitable for supporting the species for which the SPA was designated were to be lost to any development, then the applicant would need to determine (a) how significant it was (i.e. whether it was used by more than 1% of the population of qualifying bird species) and (b) provide alternative habitat to replace it in an location that was reasonably close to the Estuary; and
 - the development of the site allocation DPD would includes the identification of areas outside of the SPA/Ramsar designation that serve as important supporting habitat for qualifying bird species. The Site Allocation DPD should include appropriate mechanisms in place to ensure the loss of such sites is adequately assessed and mitigated.

Local Air Quality (Manchester Mosses SAC)

- 16.19 The only further measure that we would recommend for inclusion in policy is to make it clear that since the Manchester Mosses SAC is already exceeding its critical load any project/development within the Borough which would increase nitrogen inputs into the SAC by more than 1% will require a project level Appropriate Assessment. This will include traffic movements associated with housing. In order to avoid placing an unnecessary burden on small scale housing development proposals it may be appropriate to restrict this requirement to developments of more than 50 dwellings.

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