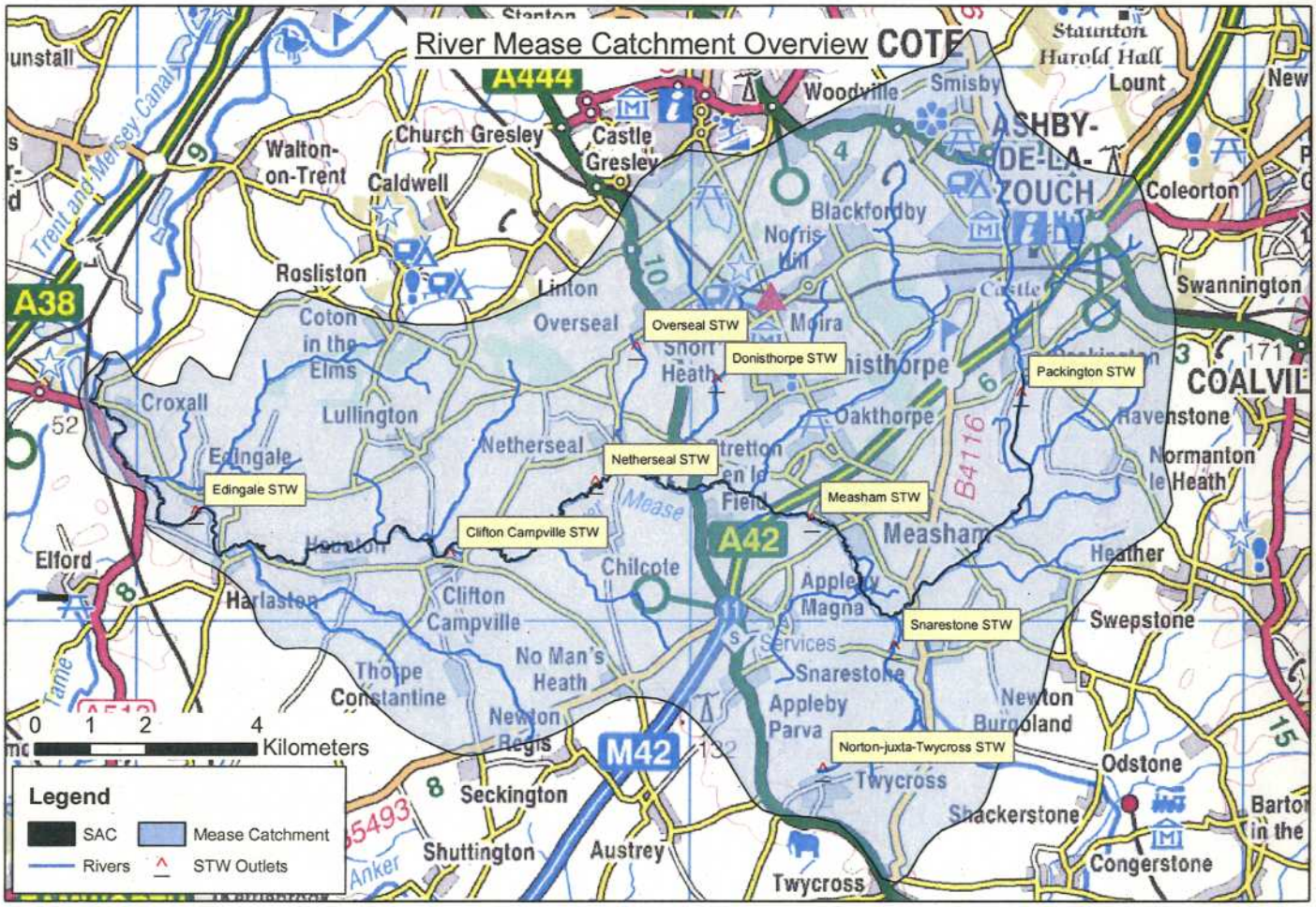
Appendix 1

A: Map of the River Mease Catchment

B: Map of River Mease Buffer used to screen the Further Consultation Draft of the Core Strategy

STW's within SAC catchment area



River Mease - SAC

- River Mease - SAC
- Potential Housing Site
- Potential Strategic Distribution Site
- 5km Buffer
- 2.5km Buffer
- District Boundary
- Settlements

CASTLE DONINGTON

KEGWORTH

ASHBY DE-LA-ZOUCH

COALVILLE

MEASHAM

IBSTOCK

BAKER associates planning consultants

Appendix 2

Natural England River Mease Conservation Objectives

Conservation objectives and definitions of favourable condition for designated features of interest

These Conservation Objectives relate to all designated features on the SSSI, whether designated as SSSI, SPA, SAC or Ramsar features.

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Name of Site of Special Scientific Interest (SSSI)	
River Mease SSSI	
Names of designated international sites	
Special Area of Conservation (SAC)	River Mease SAC
Special Protection Area (SPA)	
Ramsar	
Relationship between site designations	

Version control information		
Status of this Version (Draft, Consultation Draft, Final)	V1.0 Consultation draft	
Prepared by	Vanessa Tindale	
Date of this version	7 October 2008	
Date of generic guidance on favourable condition used	EN CSM Guidance Freshwater July 2005 CSM Guidance for Freshwater Fauna August 2005 EN CSM Guidance Mammals Feb 2004	
Other notes/version history		
Quality assurance information		
Checked by	**Name** **Nicola Orchard**	**Date** **15 December 2008**
	Signature	

Conservation Objectives and definitions of Favourable Condition: notes for users

Conservation Objectives

SSSIs are notified because of specific biological or geological features. Conservation Objectives define the desired state for each site in terms of the features for which they have been designated. When these features are being managed in a way which maintains their nature conservation value, then they are said to be in 'favourable condition'. It is a Government target that 95% of the total area of SSSIs should be in favourable condition by 2010.

Definitions of Favourable Condition

The Conservation Objectives are accompanied by one or more habitat extent and quality definitions for the special interest features at this site. These are subject to periodic reassessment and may be updated to reflect new information or knowledge; they will be used by Natural England and other relevant authorities to determine if a site is in favourable condition. The standards for favourable condition have been developed and are applied throughout the UK.

Use under the Habitats Regulations

The Conservation Objectives and definitions of favourable condition for features on the SSSI may inform the scope and nature of any 'appropriate assessment' under the Habitats Regulations. An appropriate assessment will also require consideration of issues specific to the individual plan or project. The habitat quality definitions do not by themselves provide a comprehensive basis on which to assess plans and projects as required under Regulations 20-21, 24, 48-50 and 54 - 85. The scope and content of an appropriate assessment will depend upon the location, size and significance of the proposed project. Natural England will advise on a case by case basis.

Following an appropriate assessment, competent authorities are required to ascertain the effect on the integrity of the site. The integrity of the site is defined in paragraph 20 of ODPM Circular 06/2005 (DEFRA Circular 01/2005) as the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified. The determination of favourable condition is separate from the judgement of effect upon integrity. For example, there may be a time-lag between a plan or project being initiated and a consequent adverse effect upon integrity becoming manifest in the condition assessment. In such cases, a plan or project may have an adverse effect upon integrity even though the site remains in favourable condition.

The formal Conservation Objectives for European Sites under the Habitats Regulations are in accordance with paragraph 17 of ODPM Circular 06/2005 (DEFRA Circular 01/2005), the reasons for which the European Site was classified or designated. The entry on the Register of European Sites gives the reasons for which a European Site was classified or designated.

Explanatory text for Tables 2 and 3

Tables 2, 2a and 3 set out the measures of condition which we will use to provide evidence to support our assessment of whether features are in favourable condition. They are derived from a set of generic guidance on favourable condition prepared by Natural England specialists, and have been tailored by local staff to reflect the particular

characteristics and site-specific circumstances of individual sites. Quality Assurance has ensured that such site-specific tailoring remains within a nationally consistent set of standards. The tables include an audit trail to provide a summary of the reasoning behind any site-specific targets etc. In some cases the requirements of features or designations may conflict; the detailed basis for any reconciliation of conflicts on this site may be recorded elsewhere.

Conservation Objectives

The Conservation Objectives for this site are, subject to natural change, to maintain the following habitats and geological features in favourable condition (*), with particular reference to any dependent component special interest features (habitats, vegetation types, species, species assemblages etc.) for which the land is designated (SSSI, SAC, SPA, Ramsar) as individually listed in Table 1.

Habitat Types represented (Biodiversity Action Plan categories)

Rivers and streams

Geological features (Geological Site Types)

(*) or restored to favourable condition if features are judged to be unfavourable.

Standards for favourable condition are defined with particular reference to the specific designated features listed in Table 1, and are based on a selected set of attributes for features which most economically define favourable condition as set out in Table 2, Table 2a and Table

Table 1 Individual designated interest features

BAP Broad Habitat type / Geological Site Type	Specific designated features	Explanatory description of the feature for clarification	SSSI designated interest features	SAC designated interest features	SPA bird populations dependency on specific habitats			Ramsar criteria applicable to specific habitats			
					Annex 1 species	Migratory species	Waterfowl assemblage	1a Wetland characteristics	2a Hosting rare species &c	3a 20000 waterfowl	3c 1% of population
Rivers and streams	Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Slow flowing lowland river	(*)	*							
	Bullhead, *Cottus gobio*	Presence of bullhead	*	*							
	Spined Loach, *Cobitis taenia*	Presence of spined loach	*	*							
	Otter, *Lutra lutra*	Presence of otter		*							
	White clawed crayfish, *Austropotamobius pallipes*	Presence of white clawed crayfish		*							

NB. Features where asterisks are in brackets (*) indicate habitats which are not notified for specific habitat interest (under the relevant designation) but because they support notified species.

Table 2 Habitat extent objectives

Conservation Objective for habitat extent	To maintain the designated features in favourable condition, which is defined in part in relation to a balance of habitat extents (extent attribute). Favourable condition is defined at this site in terms of the following site-specific standards:
Extent - Dynamic balance	On this site favourable condition requires the maintenance of the extent of each habitat type (either designated habitat or habitat supporting designated species). Maintenance implies restoration if evidence from condition assessment suggests a reduction in extent.

Habitat Feature (BAP Broad Habitat level, or more detailed level if applicable)	Estimated extent (ha) and date of data source/estimate	Site Specific Target range and Measures	Comments
River	Extent =22.87ha	No reduction in area and any consequent fragmentation without prior consent	Recoverable reduction = unfavourable; non-recoverable reduction = partially destroyed.

Audit Trail
Rationale for habitat extent attribute (Include methods of estimation (measures), and the approximate degree of change which these are capable of detecting).
Habitat extent estimated using GIS software and aerial photographs 2001.
Rationale for site-specific targets (including any variations from generic guidance)
Other Notes

Table 2a Species population objectives

Conservation Objective for species populations	To maintain the designated species in favourable condition, which is defined in part in relation to their population attributes. Favourable condition is defined at this site in terms of the following site-specific standards:
Population balance	On this site favourable condition requires the maintenance of the population of each designated species or assemblage. Maintenance implies restoration if evidence from condition assessment suggests a reduction in size of population or assemblage.

Species Feature	List supporting BAP Broad Habitats	Population Attribute	Site Specific Target range and Measures	Comments
Bullhead	Rivers and streams	Population	Single-pass electrofishing in August / September. Data analysis as in a-c. below. see sub-attributes below	For details see the LIFE in UK Rivers Project protocol
Bullhead	Rivers and streams	a. Adult population densities	Density estimates There should be no reduction in densities from existing levels, and in any case no less than 0.5 m^{-2} in lowland rivers (source altitude ≤100m).	Routine Environment Agency monitoring is not capable of providing suitable data. A least-cost methodology for monitoring this attribute has been developed by the LIFE in UK rivers project, involving the sampling of representative reaches within an SAC.
Bullhead	Rivers and streams	c. Reproduction/ Age Structure	Length-frequency analysis of selected samples Young-of-year fish should occur at densities at least equal to adults. Four age classes with 0+ individuals at least 40% of population Largest females attain a fork length >75mm	Young-of-year fish should be easily identifiable using length-frequency analysis. In September they are typically less than 30 mm long. Young-of-year are often much more numerous than adults, so the current target is rather conservative (to allow for natural variation in recruitment and habitat type). A ratio of 3 or 4:1 for Y-O-Y: adults is not unusual. It may be necessary to refine this target at a site-specific level.

Species Feature	List supporting BAP Broad Habitats	Population Attribute	Site Specific Target range and Measures	Comments
Bullhead	Rivers and streams	b. Distribution within SAC	GIS analysis of distribution within catchment Bullheads should be present in all suitable reaches. As a minimum, no decline in distribution from current.	In the UK, **bullhead** are widespread in any flowing water at an altitude of less than 300 m. Well oxygenated water over a gravel / pebble / cobble substrate is preferred (and is essential for successful reproduction). Riffles are a favoured microhabitat. Very sluggish water with a clay / silt substrate or cold, steep-gradient upland sections with numerous cascades and boulder / bedrock substrate should be viewed as sub-optimal. Bullheads can occur in very small channels (<1 m wide) where they may be the only fish species present. Bullhead are very poor colonists, to the extent that catchments may contain many individual subpopulations. It is not feasible to assess each of these individually, but it is very important that there is no loss of these populations, and that access routes between them are not impeded (see environmental disturbance notes below).
Spined loach	Rivers and streams	Population	Electrofishing in rivers, hand trawl in drains. There should be no reduction in densities from existing levels, and in any case no less than 0.1 m^{-2}	Routine Environment Agency monitoring is not capable of providing suitable data. A least-cost methodology for monitoring this attribute is being investigated, involving the sampling of representative reaches within an SAC.
Spined loach	Rivers and streams	Age structure	Adult population densities >0.2/m At least three year-classes should be present at significant densities. At least 40% of the population should consist of 0+ fish Largest females attain a fork length >85mm	
Otter	Rivers and streams	Otter population – inland waterways	• Otters present on site. • Population maintained or increasing.	Use LRR SAC monitoring scheme for river SACs in England, Wales and Northern Ireland. Annual survey recommended for first 5 years of LRR method.
White-clawed crayfish	Population Density	Trapping using baited small mesh traps (<8mm) in	Population of at least moderate abundance (CPUE between 0.1 - 1)	Insufficient data are available on typical densities for standing water bodies to set reliable targets. Population density is considered best expressed as catch per unit effort (CPUE) –

<table>
<tr><th>Species Feature</th><th>List supporting BAP Broad Habitats</th><th>Population Attribute</th><th>Site Specific Target range and Measures</th><th>Comments</th></tr>
<tr><td></td><td></td><td>areas of favourable crayfish habitat.

Trapping in conjunction with night viewing and hand searching where possible.</td><td>Berried females should be present during the period November to April</td><td>catch per trap night. A provisional qualitative scale is as follows:
<table>
<tr><td>CPUE
Av. no. crayfish /trap night</td><td>Relative abundance of population</td></tr>
<tr><td><0.1</td><td>moderate-low abundance</td></tr>
<tr><td><1</td><td>moderate abundance</td></tr>
<tr><td>1-2.5</td><td>moderately high abundance</td></tr>
<tr><td>2.6-4</td><td>high abundance</td></tr>
<tr><td>>4</td><td>Very high abundance</td></tr>
</table>
This is likely to require some refinement once more surveys have been carried out and compared on a wide range of sites across England and Wales.

It is accepted that crayfish densities may fluctuate naturally and thus caution should be taken in determining the condition of the site.
Nevertheless, the site should be considered unfavourable if there is a dramatic reduction in density.</td></tr>
<tr><td>White-clawed crayfish</td><td>Population densities and health</td><td>Determined during population monitoring</td><td>Thelohaniasis (Porcelain Disease) should not affect >10% population.</td><td>This disease rarely causes mass mortalities and may be present in a population at low levels without apparent harm. However, a prevalence exceeding 10% is of concern.</td></tr>
<tr><td>White-clawed crayfish</td><td>Population densities and health</td><td>Determined during population monitoring</td><td>Absence of individuals infected with crayfish plague</td><td>Crayfish plague can be introduced by the entry of non-native crayfish species into a site, but also by a variety of other routes, including contaminated equipment (nets, boots, etc.) and stocked fish from infected waters[1].

Outbreaks of crayfish plague typically result in 100% mortalities, unless there are isolated headwaters with crayfish in the catchment. This target requires that the utmost care be</td></tr>
</table>

Species Feature	List supporting BAP Broad Habitats	Population Attribute	Site Specific Target range and Measures	Comments
				taken in terms of fish stocking and general surveying/monitoring to ensure that plague vectors are not introduced. Disinfection or thorough drying of equipment (or perhaps dedicated equipment for use only in native crayfish rivers) and stocking fish from uninfected waters are vital elements. Nationally agreed EN/EA policy on stocking fish into crayfish SSSIs/SACs should prevent stocking from catchments containing signal crayfish or known to have experienced plague.

Audit Trail
Rationale for species population attributes (Include methods of estimation (measures), and the approximate degree of change which these are capable of detecting).
Rationale for site-specific targets (including any variations from generic guidance)
Other Notes

Table 3 Site-Specific definitions of Favourable Condition

CONSERVATION OBJECTIVE FOR THIS HABITAT / GEOLOGICAL SITE-TYPE	To maintain the **Rivers and streams** at this site in favourable condition, with particular reference to relevant specific designated interest features. Favourable condition is defined at this site in terms of the following site-specific standards:
Site-specific details of any geographical variation or limitations (where the favourable condition standards apply)	
These targets apply to the river and marginal vegetation only.	

Site-specific standards defining favourable condition

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation Spined loach Bullhead	Habitat structure: substrate	Field observations	**Siltation** No excessive siltation. Maximum silt content <20% in top 10cm of mid-channel gravels Channel should be dominated by clean gravels **Spined loach:** Sand fractions in finer substrates reach at least 20% sand and no more than 40% silt **Bullhead:** No excessive siltation on the surfaces of coarse substrates	Siltation levels vary naturally, depending upon the reach type and hydrodynamic regime. Most sites should have a variety of channel substrates. Localised accumulations of silt on the inside of bends or in back channels do not necessarily indicate a problem. However, widespread siltation of riverine sediments, caused by high particulate loads and / or reduced scour within the channel (due to artificial channel modifications, is a major threat to interest features. Many characteristic species of fish, invertebrates and even plants are susceptible to siltation at some stage in their life-cycle. Mechanisms of impact can relate to reduced interstitial spaces in coarse substrates, reduce water flow-through the substrate leading to poor quality of interstitial waters, and reduced sediment surface 'roughness' that eliminates refugia for animals with epibenthic habitats and prevents plant seeds and fragments from lodging in the substrate and taking root. Sources of silt include run-off from agricultural land, sewage and industrial discharges. A fluvial audit is recommended where specific problems have been identified, e.g. where there is a perceived risk of damage occurring or where species characteristic of the habitat are	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
				already believed to be in decline. **Spined loach** can tolerate silt and mud, it has a preference for sandy substrates, and these substrates should be maintained and/or restored in watercourses where sufficient hydraulic energy can be generated. If the organic content becomes too high, reduced oxygen availability near the sediment/water interface may lead to enhanced egg and juvenile mortality. High sediment cohesiveness is likely to affect the feeding process. Elevated silt levels can interfere with egg and fry survival in **bullhead**.	
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation Bullhead Spined loach	Habitat structure: channel and banks	Assess river morphology using RHS (see text and **Appendices 4 and 5 of the JNCC CSM Guidelines for Rivers, March 2005**). In addition, for planform: map data, aerial survey data, historical records and local knowledge.	**Channel form** Channel form should be generally characteristic of river type, with predominantly unmodified planform and profile. For planform the target is a score for the assessment unit of at least 3 (see **Appendix 4 of the JNCC CSM Guidelines for Rivers, March 2005**) i.e <10% of ECS river artificial, re-aligned or constrained. For naturalness of the profile using transect data the target is a score for the assessment unit of 4 or 5 (see **Appendix 5 of the JNCC CSM Guidelines for Rivers, March 2005**). i.e <0.2 No RHS site to have any of the eight categories of bank profile modification (Section I in RHS	The river should support all of the habitat features necessary for characteristic flora and fauna to thrive, in characteristic proportions. Widening or deepening of channels, and extensive artificial reinforcement of banks, are indicators of unfavourable condition. Headwater sections are particularly vulnerable to reprofiling. Watercourses with a high degree of naturalness will be governed by dynamic processes which result in a variety of physical habitat features, including a range of substrate types, variations in flow, channel width and depth, in-channel and side-channel sedimentation features, erosion features and both in-channel and bankside vegetation cover. The new version of Habitat Modification Score (HMS) enables a more sophisticated assessment to be made, based on the nature of modifications to a river and their estimated persistence. Details are being finalised by the Environment Agency, but a guideline target might be 90% or more of condition monitoring sites should fall within the *semi-natural* HMS class 1, with the remainder *predominantly unmodified* (class 2). **Spined loach** :A natural channel morphology provides the diversity of breeding/nursery habitat, cover from predators, refuge against high flows, and feeding opportunities that best meet the full life cycle	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
			2003 form) recorded as 'extensive'. In-channel natural features present at frequent intervals (such as riffle/pool sequences, pools, slacks and submerged tree root systems)	requirements of the species. The close proximity of riffles and pools is particularly important for this sedentary animal. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable within the SAC, whilst restoration *may/will* be needed in some reaches.	
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Plant community: reproduction	Field observations during annual macrophyte survey. Mapping of flowering *Ranunculus* in sample sections every 3 years.	A sufficient proportion of all aquatic macrophytes should be allowed to reproduce in suitable habitat, unaffected by river management practices. *Ranunuculus* should be able to flower and set seed.	Flowering outside the normal period and weed cutting or other activities that do not leave patches of plants to flower (at least 25% in every 100m of river) and set seed are indicators of unfavourable condition. 25% of the total habitat / macrophyte population should be left uncut for the full duration of the growing season. Use of herbicides should be avoided.	Yes
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Negative indicators: native species	Survey the macrophytes of representative stretches at intervals of *ca.* 5 km, using the method of Holmes (1983) and a standard check-list of macrophyte species (see Appendix 2 of the **JNCC CSM Guidelines for Rivers, March 2005**).	**For blanketweed, epiphytic or other algae, *Potamogeton pectinatus* or *Zannichellia palustris*:** Cover values over 25% should be considered unfavourable, and should trigger further investigation. Cover values should not increase significantly from an established baseline. **ii) For taxa with STRs as follows:** For taxa with STR values of 1 or 2, cover values	Taxa typically associated with enrichment are considered negative indicators of favourable condition. The species will vary depending on the River Community Type. Species that are characteristic of enrichment, or have atypically low Species Trophic Ranks (STRs) in the Mean Trophic Rank (MTR) system (Holmes et al., 1999) and that are recorded as dominant (3), are used as indicators. Note: in using MTR, each species is allocated a score dependent on its tolerance to eutrophication; this system cannot be used to assess acidification. Expert judgement will be important in assessing the ecological significance of cover values of these species. At some sites, it may be appropriate to set more stringent targets. Occasionally thresholds may need to be raised, according to wider conservation objectives. ***Alien species are assessed within the Negative indicators: alien/ introduced species attribute instead.***	

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
			over 25% should be considered unfavourable, but should trigger further investigation. Cover values should not increase significantly from an established baseline.		
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Negative indicators: alien/ introduced species	For aquatic and marginal macrophytes the presence of alien species listed in Appendix 10 of the **JNCCCSM Guidelines for Rivers, March 2005** should be noted during the macrophyte survey and the scoring system for naturalness applied. For other organisms contact external organisations (e.g. EA, SEPA, EHS, fisheries trusts and boards) for local reports on alien or introduced species.	No impact on native biota from alien or introduced macrophyte species Aquatic and marginal macrophytes The mean SERCON score for naturalness (derived from individual survey sites) should be 4 or 5 (see Appendix 10 of the **JNCCCSM Guidelines for Rivers, March 2005**). i.e >95% of aquatic and marginal macrophyte sp are native No other alien/introduced species present at levels likely to be detrimental to the characteristic biological community.	Non-native species constitute a major threat to many river systems. For example, species such as signal crayfish have been responsible for much of the decline of native crayfish through competition, habitat damage and the introduction of crayfish plague. Note: 'Introduced species' include species that are native to the UK but outside of their natural range. The SERCON scoring system for naturalness of aquatic and marginal macrophytes is used to assess alien plant species. Note: This protocol applies to negative indicator species of the channel and channel margins. Negative indicator species found on banks and the riparian zone are assessed as part of the naturalness of banks and naturalness of riparian zone assessment and form part of the CSM structure attribute Expert judgement will be needed to determine whether there is sufficient evidence to generate an unfavourable condition assessment. For example, for signal crayfish, presence alone would constitute unfavourable condition. Other species, such as barbel, can be tolerated at low levels; higher levels would constitute unfavourable condition.	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation White-clawed crayfish Bullhead Spined loach	Negative indicators: In-stream barriers	Strategic assessment of barriers affecting the characteristic species of the SSSI.	No artificial barriers significantly impairing characteristic migratory species from essential life-cycle movements.	Barriers may take the form of weirs, barrages or intakes/off-takes that entrain characteristic species. Species may be anadromous (e.g. salmon), catadromous (e.g. eels) or migrate over relatively short distances within the river system (e.g. bullhead, brook lamprey and invertebrates without flying life stages). A range of data sources may be used and brought together to make this assessment. Specific studies may be required in relation to some barriers where impacts are uncertain and remedial costs are potentially high. Free movement within the channel is necessary to ensure maintenance of genetic diversity (and therefore population viability) and to provide the potential for recolonisation of waters that have become artificially denuded of **spined loach**. Vertical drops of >18-20 cm are sufficient to prevent upstream movement of adult **bullheads**. They will therefore prevent recolonisation of upper reaches affected by lethal pollution episodes, and will also lead to constraints on genetic interactions that may have adverse consequences. New instream structures should be avoided, whilst the impact of existing structures needs to be evaluated.	Yes
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Plant community: species composition and abundance	Survey the macrophytes of representative stretches at intervals of *ca.* 5 km , using the method of Holmes (1983) and a standard check-list of macrophyte species (see Appendix 2 of the **JNCC CSM**	**(i) <u>Species Composition</u>** The following should all occur for river type II • At least 60% of species with abundance V or IV in the constancy table should be present, AND	**Species with abundance V & IV:** *Agrostis stolonifera, Cladophora/Rhizoclonium* agg., *Enteromorpha* sp. *Epilobium hirsutum, Glyceria maxima, Lemna minor, Leptodictyum riparium, Mentha aquatica, Myosotis scorpioides,* other tree species, *Persicaria amphibian, Phalaris arundinacea, Potamogeton pecinatus, Rorippa amphibian, Rorippa nasturtium-aquaticum/ microphylla* agg., *Salix* spp, *Scrophularia auriculata, Solanum dulcarmara, Sparganium emersum, Sparganium erectum, Vaucheria sp., Veronica beccabunga* **Species with abundance III**: *Alisma plantago-aquatica, Apium nodiflora, Callitriche stagnalis, Filipendula ulmaria, Iris pseudacorus,*	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
		Guidelines for Rivers, March 2005). Evaluate the community against the target community in the constancy tables (Appendix 8 of the **JNCC CSM Guidelines for Rivers, March 2005**). Record measures of species composition and abundance on the form in Appendix 9 of the **JNCC CSM Guidelines for Rivers, March 2005**. Alien species, filamentous green algae (including *Cladophora, Vaucheria*, and *Enteromorpha)* and other species indicative of eutrophication are not included in these targets and are dealt with in separate targets below.	• At least 25% of species with abundance III should be present. **(ii) <u>Loss of Species</u>** 60% of species with cover >1 in the initial baseline survey should be at least present and all species recorded as dominant in the initial baseline survey should still be present. **(iii) <u>Abundant Species</u>** At least 25-35% of species recorded as dominant in the initial baseline survey should still recorded as dominant.	*Juncus inflexus, Lycopus europaeus, Lythrum salicaria, Myosoton aquaticum, Myriophyllum spicatum, Nuphar lutea, Potamogeton crispus, Potamogeton perfoliatus, Ranunculus sceleratus, Sagittaria sagittifolia, Schoenoplectus lacustris, Symphytum officinale.* In-channel vegetation of SSSI/SAC rivers should be dominated by characteristic species. Species composition and abundance should be assessed using data from two 500 m stretches in each assessment unit where possible. When assessing targets (ii) and (iii), the data from all macrophyte survey sites in the assessment unit should be pooled and compared against pooled baseline data/reference condition. Cover values are expressed using a simplified DAFOR 3-point scale. Where necessary, 5-point scale data converts into the 3-point scale as follows: 5/4 = 3, 3 = 2, 2/1 = 1. Any sections classified as Type IV are considered to be in unfavourable condition. Comparisons in (ii) and (iii) should be made with the initial baseline survey/reference condition, not with survey data from the previous monitoring cycle. Non-native species are not considered under this attribute, but are covered under Negative indicators. Rare species are not considered under this attribute, but are taken account of under Indicators of local distinctiveness. Note that this component of the generic habitat FCT need not be applied to sectional river SSSIs designated for river habitat where the plant community is not a specific notified feature.	
Bullhead	Negative indicators:	Assessment of stocking consents in	No artificial releasing of fish unless it is widely agreed that this	Many characteristic species can be affected by fish introductions, through increased predation, competition or genetic introgression, or	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
Spined loach	Fish introductions	relation to guidance on acceptable stocking levels.	is in the best interests of the populations and then only with local stock. Fish introductions should not interfere with the ability of the river to support self-sustaining and healthy populations of characteristic species.	through disease transfer. Guidance is being generated on the levels of stocking deemed to be ecological acceptable within SSSIs. The presence of artificially high densities of salmonids and other fish will create unacceptably high levels of predatory and competitive pressure on juvenile and adult **bullhead**. Excessively high densities of predatory and benthivorous fish species can cause unacceptably high predation pressure and alter sediment characteristics and sedimentary food supply in ways that are highly detrimental to **spined loach**. Care needs to be taken to ensure that stocking exercises do not keep the densities of such species at unnaturally high levels.	
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation White-clawed crayfish Bullhead Spined loach	Habitat functioning: water quality (General assessments)	EA standard monitoring protocols	**Biological GQA** Class 'A' / 'B' for all reaches of the river **Chemical GQA** Class 'A' / 'B' for all reaches of the river	A wide range of water quality parameters can affect the status of interest features, but standard biological monitoring techniques provide a reasonably integrated picture in relation to many parameters. The Biological Module of the Environment Agency's General Quality Assessment scheme is based on assessment of the macroinvertebrate community. All classified reaches within the site should comply with the targets given. The chemical module of the GQA scheme sets standards for dissolved oxygen, biochemical oxygen demand and total ammonia. It therefore covers a number of water quality parameters that commonly cause problems within river systems. Where modelling has been undertaken, the river should comply with the targets at all points along it length except within effluent mixing zones of acceptable size. Generally, water quality should not be injurious to any life stage. A wide range of water quality parameters can affect the status of interest features, but standard biological monitoring techniques provide a reasonably integrated picture in relation to many parameters.	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
				All classified reaches within the site that contain, or should contain, crayfish under conditions of high environmental quality should comply with the targets given.	
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Habitat functioning: water quality	EA monitoring	**Un-ionised ammonia** <0.021 mg L-1 .as a 95-percentile	The un-ionised form of ammonia is highly toxic to freshwater fauna. This target is the same as the EQS used by the EA. Where modelling has been undertaken, the river should comply with the targets at all points along it length except within effluent mixing zones of acceptable size.	Yes
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation Bullhead Spined loach	Habitat functioning: water quality	EA monitoring	**Suspended solids** No unnaturally high loads. Spined loach and bullhead: <25mgl/litre annually	Many characteristic species of different river types are susceptible to elevated solids levels, through reduced light availability (for photosynthesis), the clogging of respiratory structures, impaired visibility or siltation of coarse substrates. Lowland clay and alluvial river sections are more depositional in character and resident biota are generally more tolerant. Suspended solids measurements are also essential to the estimation of particulate loads within the river network (in combination with gauged flow data), to provide an indication of the risk of siltation. Elevated levels of suspended solids can clog the respiratory structures of crayfish.	

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
				The target of <25 mg L^{-1} (annual mean) is based on the EC Freshwater Fish Directive. Most river SSSIs/ ASSIs and SACs do not extend to the entire catchment. Some life-cycle stages are potentially susceptible to damage from siltation, the source of which may lie elsewhere in the catchment outside the site boundary. Sources of fines include run-off from arable land, land (especially banks) trampled by livestock, sewage and industrial discharges.	Yes
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation Bullhead Spined loach White-clawed crayfish	Habitat functioning: water quality	EA monitoring	**Orthophosphate levels:** < 0.10mg/litre as an annual mean	Elevated phosphorus levels interfere with competitive interactions between higher plant species and between higher plants and algae, leading to dominance by attached forms of algae, deterioration of vegetative habitat, and declines in abundance and/or diversity of characteristic plant species (which may include lower plants such as mosses and liverworts). The respiration of artificially large growths of benthic or epiphytic algae may generate large diurnal sags in dissolved oxygen in the water column and/or substrate fish and invertebrate species. Excessive benthic algal growth can also enhance the trapping of fine sediments within riverine gravels, enhancing siltation and exacerbating poor substrate conditions. Where modelling has been undertaken, the river should comply with the targets at all points along it length except within effluent mixing zones of acceptable size.	Yes
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation	Habitat structure: channel and banks	For bank vegetation: a simplified Phase I habitat survey, carried out at 10 RHS transect locations or as part of the sweep-up survey (see Appendix 6 of the **JNCC CSM Guidelines for Rivers, March 2005**).	**Bank and riparian zone vegetation** Bank and riparian zone vegetation structure should be near-natural. For bank vegetation the target is a mean score for the assessment unit of 4 or 5. For riparian zone vegetation the	Note: The protocol in Appendices 6 and 7 of **JNCC CSM Guidelines for Rivers, March 2005** used to assess bank and riparian zone naturalness incorporates a modification due to negative indicator species. **Spined loach**: Extent of submerged and marginal plants: A mosaic of bare substrate and submerged beds of higher plants provides optimal conditions in relation to feeding, cover from predators and spawning (which occurs on submerged plants). Marginal emergents also provide important cover and feeding opportunities. Vegetation	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
		For the riparian zone: RHS transect data, assessed using the protocol in Appendix 7 of the **JNCC CSM Guidelines for Rivers, March 2005**.	target is a mean score for the assessment unit of 4 or 5.	management should be limited to no more than 50% of the channel width (submerged plants) and 50% of bank length (marginal fringe), cut in patches. Most river SSSIs/ ASSIs and SACs do not extend to the entire catchment.	
Bullhead	River morphology	Routine statutory agency consenting process	Woody debris removal should be minimised, and restricted to essential activities such as flood defence	**Bullheads** are particularly associated with woody debris in lowland reaches, where it is likely that it provides an alternative source of cover from predators and floods. It may also be used as an alternative spawning substrate.	Yes
Bullhead	River morphology	Routine statutory agency consenting process	Weed cutting should be limited to no more than half of the channel width	The importance of submerged higher plants to **bullhead** survival is unclear, but it is likely that where such vegetation occurs it is used by the species for cover against predators. Weed cutting should be limited to no more than half of the channel width in a pattern of cutting creating a mosaic of bare substrate and beds of submerged plants.	Yes
Bullhead	River morphology	Assess river morphology using RHS and fluvial audit	River habitat SSSI features should be in favourable condition. Maintain the characteristic physical features of the river channel, banks and riparian zone. • Slack water refuges should be present • Patches of high canopy tree cover should be present along channel banks with associated woody debris present within the channel • Unsilted coarse (gravel / pebble / cobble) dominated substrate should be present	The characteristic channel morphology provides the diversity of water depths, current velocities and substrate types necessary to fulfil the spawning, juvenile and dispersal requirements of the species. The close proximity of different habitats facilitates movement to new preferred habitats with age. Operations that widen, deepen and /or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable within the SAC, whilst restoration may be needed in some reaches. Unsilted coarse (gravel / pebble / cobble) dominated substrate: males guard sticky eggs on the underside of stones. Larger stones on a hard substrate providing clear spaces between the stream bed and the underside of pebbles / cobbles are therefore important. Slack-water refuges provide important refuges against high flow conditions. Suitable refuges include pools, submerged tree root systems and marginal vegetation with >5 cm water depth.	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
				The relative importance of shade compared with the provision of woody debris is unclear, but the maintenance of intermittent tree cover in conjunction with retention of woody debris ensures that habitat conditions are suitable. *In lowland reaches without any riparian trees, it may be desirable to introduce a limited amount of cover.*	
White-clawed crayfish	River morphology	Assess river morphology using RHS	Maintain the characteristic physical features of the river channel, banks and riparian zone. • Engineering works affecting crayfish habitat and refuges must at least replace the pre-works availability of such habitat and refuges. • Extent of large woody debris: Woody debris should be retained in-situ unless it poses a flooding or health and safety risk. • Vegetation management should be limited to no more than 50% of the channel width (submerged plants) and 50% of bank length (marginal fringe). • Extent of overhanging riparian vegetation: this should cover at least 10% of the bank length throughout the year, distributed in patches along the margins	A natural channel morphology provides a diversity of refuge and feeding opportunities. The proximity of different refuges facilitates foraging and the movement of individuals to different habitats with age. Operations that widen, deepen and/or straighten the channel reduce variations in habitat. New operations that would have this impact are not acceptable within an SAC, whilst restoration may be needed in some reaches. Extent of cobbles/ boulders: where they occur naturally, cobbles and boulders are used extensively by crayfish as refuge. Engineering works can result in the loss of large material – any works should at least replace the pre-works availability of such refuges. Fallen branches and trunks are used extensively by crayfish as refuge. Woody debris is typically removed during maintenance operations, but it is important to retain as much as possible, particularly where other forms of refuge are in short supply. Bankside refuges provide important refuges and are often lost during engineering operations. Any works should at least replace the pre-works availability of refuges. Submerged higher plants provide cover away from the banks, and also represent a valuable food source. Marginal emergents also provide important cover and feeding opportunities. Overhanging trees provide valuable shade and food sources and, in addition, supply woody debris to the river. Submerged tree-root	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
			• Extent of bankside tree cover: overhanging trees should cover between 5 – 10% of the bank length, distributed in patches along the margins. provide valuable shade & food sources and, in addition, supply woody debris to the river. Submerged tree-root systems provide important cover & refuges from flood flows.	systems provide important cover and refuges from flood flows.	
White-clawed crayfish Bullhead	Negative indicators	Crayfish surveys in catchments thought to be at risk	Non-native crayfish should be absent. If present, measures should be taken to control their numbers.	Once non-native crayfish species are established in a water body, native populations are usually eliminated quite rapidly, if not by competition and predation then by crayfish plague. If already present in an SAC, measures should be taken to control the spread of alien species and, if possible, reduce their numbers. Bullhead densities have been found to be negatively correlated with densities of non-native crayfish in the River Great Ouse, suggesting competitive and/or predator-prey interactions.	Yes
Otter	Food availability	EA, local fishery trusts and/or SFCC data	Fish biomass stays within expected natural fluctuations.	Accurate information on fish stocks is difficult to obtain according to a recent review of data from England, produced by the Environment Agency (Research and Development Technical Report TR W256, Otters- Fish Prey Availability, Biomass and Sustainability) and may be extremely difficult to interpret. However, there is an obligation to monitor fish communities under the Water Framework Directive and a more comprehensive monitoring system is being instigated by the Environment Protection Agencies.	Yes
Otter	Toxic chemicals	Monitoring by relevant Environment Protection Agency. Specialist group to meet at intervals to identify national trends	No increase in pollutants potentially toxic to otters.	Liaison between Country Agency Staff and EA/SEPA essential.	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
		and extract information on individual SACs.			
Otter	Anthropogenic mortality 2 (Discretionary)	Road and rail casualties. Deaths due to fishing gear etc. Any site where there is a feature causing otter mortality. Data from EA's reporting system. Obtain views from EA on implications of recent data. JNCC otter data on the CITES database.	Otter populations not significantly impacted by human induced kills.	Monitoring this attribute, where appropriate should provide data for installing mitigation.	Yes
Otter	Disturbance	Extent of public access to river	No significant change to river or bankside usage. No significant development		Yes
Otter	Bankside cover	Proportion of bank lined with trees, scrub or thick vegetative cover	No overall permanent decrease	Some change acceptable as long as no overall decrease.	Yes
Water courses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation White-clawed crayfish	Habitat functioning: water flow	Data on gauged and naturalised flows, flow accretion methods, and the Resource Assessment Method (RAM) Framework. Field observations	Flow regime should be characteristic of the river. Levels of abstraction should not exceed the generic thresholds laid down for moderately sensitive SSSI rivers by national guidance: Maximum acceptable % deviations from daily naturalised flows throughout the river: <Qn 50 – 20%	River flow affects a range of habitat factors of critical importance to bullhead and spined loach, including current velocity, water depth, wetted area, substrate quality, dissolved oxygen levels and water temperature. There should be >5 cm water depth over riffles in summer. The maintenance of both flushing flows and baseflows, based on natural hydrological processes, is vital. Detailed investigations of habitat-flow relationships may indicate that a more or less stringent threshold may be appropriate for a specified reach; however, a precautionary approach would need to be taken to the use of less stringent values. As a guideline, at least 90% of the naturalised daily mean flow should remain in the river throughout the year.	Yes

Criteria feature	Attribute term in guidance	Measure	Site-specific Targets	Comments	Use for CA
Bullhead Spined loach			Qn50 – 95 – 15% >Qn95 – 10-15% Ecological flow criteria already laid down for the river should also be complied with. There should be no obvious problems with water availability within the monitoring unit.	Naturalised flow is defined as the flow in the absence of abstractions and discharges. The generic targets vary according to the specific sensitivity of the reach type, with large lowland rivers having somewhat lower sensitivity than headwater streams. Any relaxation of generic targets on regulated SSSI rivers should relate to the desirability and ecological sustainability of regulating structures. The availability and reliability of data is patchy – long-term gauged data can be used until adequate naturalised data become available, although the impact of abstractions on historical flow records should be considered.	

Audit Trail
Rationale for limiting standards to specified parts of the site
Indicators of local distinctiveness removed from the standards as site-specific aspects are covered by other attributes.
Rationale for site-specific targets (including any variations from generic guidance)
Habitat structure: substrate target taken from EA Conservation Strategy for the River Mease SAC in Liaison EA File.
Rationale for selection of measures of condition (features and attributes for use in condition assessment) **(**The selected vegetation attributes are those considered to most economically define favourable condition at this site for the broad habitat type and any dependent designated species).
Other Notes

Appendix 3

River Basin Management Plan for the Humber River Basin District (extract)

defra
Department for Environment Food and Rural Affairs

Environment Agency

Water for life and livelihoods

River Basin Management Plan
Humber River Basin District

Annex D: Protected area objectives

N2K Protected Area in Humber River Basin District (River Mease SAC)

Protected Area name **River Mease SAC**	***Protected Area designation*** Habitats Directive (Council Directive 92/43/EEC): http://www.jncc.gov.uk/page-1374 Detailed site information: http://www.natureonthemap.org.uk/	***Is the Protected Area meeting its environmental objectives as required by Article 4 (1c)?*** **No** ***If not, date for achieving environmental objectives*** **2015** If extended, justification provided at end of this table

Overall objective for Protected Area:

Favourable Conservation Status (to protect and, where necessary, improve the water or water-dependent environment to the extent necessary to maintain at or improve to Favourable Conservation Status the water-dependent habitats and species for which the Protected Area is designated)

Water-dependent habitats or species for which the Protected Area was designated (interest features):

Bullhead (S1163); Otter (S1355); Rivers with floating vegetation often dominated by water-crowfoot (H3260); Spined loach (S1149); White clawed crayfish (S1092)

Waterbody ID:

GB104028046560; GB104028046570; GB104028046590

Reason for feature/s either not meeting objective or being at risk of deterioration			***Measures proposed to maintain at, or improve to, Favourable Conservation Status***		***Measure to be made operational no later than***
Attribute	-	*Reason*	*Measure*	*Organisation responsible*	
Hydrology	-	Drainage	Undertake specific management works	Highways Agency	2012
Hydrology	-	Water abstraction	Abstraction licence - revoke or amend	Environment Agency	2012
Invasive species	-	Invasive freshwater species	Invasive species control programme for protected areas	Natural England	2012
Morphology	-	Inland flood defence works	Flood management programme	Environment Agency	2012
Water quality	-	Water pollution - agriculture / run off	Develop pollution action plan (evaluate impacts and apply appropriate solution, e.g. catchment sensitive farming, water protection zone or control of discharges)	Natural England	2012
Water quality	-	Water pollution - agriculture / run off	Develop pollution action plan (evaluate impacts and apply appropriate solution, e.g. catchment sensitive farming, water protection zone or control of discharges)	Environment Agency	2012
Water quality	-	Water pollution - discharge	Discharge consent - revoke or amend	Environment Agency	2012
Water quality	-	Water pollution - discharge	Implement AMP scheme	Severn Trent Water Limited	2012

Appendix 4
Screening of Core Strategy Policies

Key

A policy will have **no effect at all or only positive effects** on the SAC

B policy will have **no significant adverse effect (alone or in combination)** on the SAC

C policy could be likely to have a **significant effect alone** on the SAC

D policy could be likely to have a **significant effect in combination** on the SAC

E policy would have **uncertain effects** on the SAC that should be addressed in a **lower tier assessments including proposal specific appropriate assessment**

F impact on the SAC depends on **how the option is implemented**

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS1 **District Housing Provision**	This policy provides the overall housing number for the district up to 2031. It gives no detail of the quantity of development directed to each area. Therefore the likelihood of impacts cannot be predicted.	Potential for significant impacts although this will depend on the distribution of growth and implementation.	E	Mitigation will be through implementation of policy CS1 and where housing is delivered, as well as implementation of other policies and how development is delivered. Site by site mitigation may be necessary for specific site allocations or development proposals. All proposals will need to meet the criteria as set out in CS33.	A
Policy CS2 **District Employment Provision**	This policy provides the overall provision of employment land for the district up to 2031. It gives no detail of the quantity of development directed to each area. Therefore the likelihood of impacts cannot be predicted.	Potential for significant impacts although this will depend on the distribution of growth and implementation.	E	Mitigation will be through implementation of policy CS2 and where employment is delivered, as well as implementation of other policies and 'how' development is delivered. Site by site mitigation may be necessary for specific site allocations or development proposals. The spatial distribution of employment development should be included in this policy to show the cumulative growth in any one location. All proposals will need to meet the criteria as set out in CS33.	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS3 **East Midlands Airport**	This policy promotes airport related development at East Midlands Airport which is not located within the water catchment area of the SAC. The policy also promotes travel to the airport by means other than the private car, which would benefit the SAC. It is unclear if the airport is supporting increased flights, which would increase air pollution which might have an impact on the site.	No relationship	A	NA	A
Policy CS4 **Strategic Highway Network Improvements**	This policy sets out the strategic highway network improvements within the district, which are mainly outside the buffer area of the SAC. These routes will be used for road travel and therefore contributing to poor air quality and acid deposition, though increased use and expansion of the routes. Air quality is not identified as one of the Mease SAC vulnerabilities. However, improving the road network could encourage more people to use their cars within the District and therefore potentially increase surface water run-off and increased pollution in the River Mease.	Minor or no impacts	A	Surface water run-off from roads should be designed to avoid risked to surface and ground. However, policy CS26 Flood Risk includes reference to surface water runoff from all developments.	A
Policy CS5 **Rail Infrastructure**	The intent of this policy is to increase the viability of alternatives to car travel in the District. This may have positive implications in relation to reducing car travel and increased surface run-off, creating water pollution.	No relationship	A	NA	A
Policy CS6 **Strategic Rail Freight Interchange**	The policy supports a national freight line but does not provide any detail of the location of the line. Therefore the likelihood of impacts cannot be predicted.	Potential for significant impacts although this will depend on implementation at a national level	E	All proposals will need to meet the criteria as set out in CS33.	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS7 **Location of Development**	This policy sets the settlement hierarchy but does not provide any detail of the quantity of development directed to each area. Therefore the likelihood of impacts cannot be predicted.	Potential for significant impacts although this will depend on implementation and the distribution of growth.	E	Mitigation will be through implementation of policy CS8 and how much development is delivered where, as well as implementation of other policies and 'how' development is delivered. Site by site mitigation may be necessary for specific site allocations or development proposals. The spatial distribution of employment development should be included either in policy CS2 or CS8. All proposals will need to meet the criteria as set out in CS33.	A
Policy CS8 **Countryside**	This policy sets out the type of development that would be permitted outside urban boundaries. The policy will help protect undeveloped land from development. Development that is permitted will need to conform with the protection policies of the Core Strategy.	Positive	A	All proposals will need to meet the criteria as set out in CS33.	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS9 **Development Adjoining Swadlincote**	This policy provides for a potential extension to Swadlincote, in South Derbyshire, to be within North West Leicestershire. The criteria states South Derbyshire have to allocate the most sustainable option. This housing would be additional to the housing number identified for North West Leicestershire.	Potential for significant impacts although this will depend on implementation and the distribution of growth.	E	Impact of housing on the SAC, together with the existing housing number for North West Leicestershire, would need to be assessed, once work has been completed by South Derbyshire on housing need for Swadlincote for preferred location. Mitigation will be through implementation of policy. Site mitigation may be necessary for specific site allocations or development proposals. All proposals will need to meet the criteria as set out in CS33.	A
Policy CS10 Meeting the Development Needs of Business	This policy sets to allocate 58 ha of employment land but does not identify the sites or locations. It gives no detail of the quantity of development directed to each area. Therefore the likelihood of impacts cannot be predicted.	Potential for significant impacts although this will depend on the distribution of growth and implementation.	E	Mitigation will be through implementation of policy CS10 and where employment is delivered, as well as implementation of other policies and how development is delivered. Site by site mitigation may be necessary for specific site allocations or development proposals. The spatial distribution of employment land should be included in this policy to show the cumulative growth in any one location. All proposals will need to meet the criteria as set out in CS33.	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS11 **Education and Training in Connection with New Developments**	This policy promotes education and training for local people through major new developments, which will be supported by a Supplementary Planning Document.	No relationship	A	NA	A
Policy CS12 **Town and Local Centres**	This policy sets the hierarchy of retail centres in the District, but does not provide any detail of the quantity of development directed to each centre. These centres are within existing settlements. The potential impacts on the River Mease SAC site are unknown.	Low likelihood of impact.	E	Mitigation will be through implementation of policy CS12 and how much retail is delivered, as well as implementation of other policies and 'how' development is delivered. Site by site mitigation may be necessary for specific site allocations or development proposals. All proposals will need to meet the criteria as set out in CS33.	A
Policy CS13 **Rural Economy**	This policy sets out the restrictions for permitting employment use in rural locations. The policy will help protect undeveloped land from development. Development that is permitted will need to conform with the protection policies of the Core Strategy.	Positive	A	NA	A
Policy CS14 **Donington Park**	This policy promotes car racing related development at Donington Park which is not located within the buffer of the SAC.	No relationship	A	NA	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS15 **Distribution of Housing**	This policy provides the housing numbers for specific locations within the District, some of which would directly impact on the River Mease SAC.	Potential for significant impacts although this will depend on implementation.	D	Mitigation will be through implementation of policy. Site by site mitigation may be necessary for specific site allocations or development proposals. All proposals will need to meet the criteria as set out in CS33.	A
Policy CS16 **Housing Density**	This policy sets minimum standards for residential density. It should help to make the best use of available land, protecting greenfield sites. Impacts on the River Mease SAC could potentially increase with an increase of housing depending on the location of the homes.	Potential for significant impacts although this will depend on the distribution of growth and implementation.	E	Mitigation will be through implementation of policy. Site by site mitigation may be necessary for specific site allocations or development proposals. The impact will depend on the spatial distribution of housing. Sufficient headroom capacity will need to be available for all housing. All proposals will need to meet the criteria as set out in CS33.	A
Policy CS17 **Housing Mix**	This policy provides for minimum housing densities for town centre and other locations within the district, of 40dph and 30 dph respectively.	No relationship	A	NA	A
Policy CS18 **Affordable Housing**	This policy does not have a direct impact on the River Mease SAC.	No relationship	A	NA	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS19 **Rural 'Exception' Sites for Affordable Housing**	This policy does not have a direct impact on the River Mease SAC.	The scale of this type of development means significant impacts are very unlikely	A	NA	A
Policy CS20 **Gypsies, Travellers and Travelling Showpeople**	The policy does not give allocations for these sites and the type of development is unlikely to have any significant impact.	The scale of this type of development means significant impacts are very unlikely	A	NA	A
Policy CS21 **Well-Designed Buildings and Places**	This policy is broad in its coverage, setting out brief criteria that residential development is required to meet. These criteria include being responsive to context, easy to get around and well-design public spaces. Ultimately this policy should be positive in helping to protect the designated area.	Likely to be positive impacts	A	NA	A
Policy CS22 **Infrastructure and Developer Contributions**	The policy may have positive implications for the SAC by including the possibility of agreements for contributions to improve sewerage treatment works and subsequently not impacting on water quality.	No relationship	A	NA	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS23 **Transport**	The policy seeks to locate development in locations with existing services and facilities, in line with the development strategy. Some of these locations, including Measham and Ashby, would have an impact on the SAC, but will depend on the exact location and amount of development proposed. The intent of the remaining part of the policy is to increase use of transport alternative to car travel. This may have positive implications in relation to improving air quality and reduce the amount of pollution in water surface run-off from roads.	Potential for significant impacts although this will depend on the distribution of growth and implementation.	E	Mitigation will be through implementation of policy. Site by site mitigation may be necessary for specific site allocations or development proposals. All proposals will need to meet the criteria as set out in CS33.	A
Policy CS24 **Climate Change and New Development**	This policy does not directly relate to the SAC site.	No relationship	A	NA	A
Policy CS25 **Sustainability and New Development**	This policy has a direct positive impact to the River Mease SAC.	Positive	A	All proposals will need to meet the criteria as set out in CS33.	A
Policy CS26 **Flood Risk**	This policy does not directly relate to the SAC site.	No relationship	A	NA	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS27 Ground water Protection and Land Instability	This policy protects the groundwater resources and quality from development impacts.	Positive	A	NA	A
Policy CS28 **Strategic Green Infrastructure**	This policy relates to the protection and enhancement of multi-functional areas of green space. This policy is likely to be positive for the protection of open space. This policy is unlikely to have an adverse impact on the SAC.	None	A	NA	A
Policy CS29 **Open Space, Sport and Recreation**	This policy does not directly relate to the SAC site.	No relationship	A	NA	A
Policy CS30 **The National Forest** **Policy CS31 Charnwood Forest Regional Park**	These policies relates to woodland stretching across the whole of the District, including land within the catchment area of the River Mease. This policy does not relate to protection of the SAC, which is protected by another Core Strategy policy, and protected under national policy and legislation.	Positive	A	Supporting text could refer to links to the SAC and need to protect habitat links near the internally designated site.	A
Policy CS32 **Natural Environment**	The policy seeks to protect and enhance the natural environment, providing specific natural environment and geological designations which do not include SACs.	Positive	A	All proposals will need to meet the criteria as set out in CS33.	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS33 **River Mease Special Area of Conservation**	The policy restricts policy unless there is enough headroom capacity, and therefore means there will be no more impact from new development on water quality. Come developments will need to adhere to Developer Contribution Strategy. It is unclear how improvements will be made to water quality in this location.	Positive or no significant adverse impacts are likely	A	Mitigation could be put in place to help improve the water quality and SAC condition, through developer contributions.	A
Policy CS34 **Conserving and Enhancing the Historic Environment**	This policy does not directly relate to the SAC site.	No relationship	A	NA	A
Policy CS35 **Coalville Urban Area**	The policy relates only to development in Coalville, which is out of the River Mease SAC catchment.	No relationship.	A	NA	A
Policy CS36 **Coalville Urban Area Directions of Growth**	The policy relates only to development in Coalville, which is out of the River Mease SAC catchment.	No relationship	A	NA	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS37 **Ashby de la Zouch**	This policy directs a total of 1400 homes to within the catchment of the River Mease SAC over the plan period. However, only 605 of these still require planning permission. The policy also sets out other types of development that will be required in to support growth and this includes waste water generating uses, such as schools. All new development will have to be served by the Packington Waste Water Treatment works that is nearing capacity.	Significant negative.	C	Proposals are in place to mitigate the impacts of development in Ashby-de-la-Zouch on the River Mease. This will require monitoring of the River Mease water quality and capacity at the Waste Water Treatment works. Where capacity is shown to be reached or where water quality has shown to have deteriorated no further development will be permitted until suitable measures. These include providing additional capacity or alternative solutions to waste water treatment at Packington. Developers will be required to comply with the Developer Contribution Scheme to identify a long-term solution to the water quality risks. Development proposals may also require site specific appropriate assessment.	E
Policy CS38 **Castle Donington**	The policy relates only to development in Castle Donington, which is out of the River Mease SAC catchment.	No relationship	A	NA	A
Policy CS39 **Ibstock**	The policy relates only to development in Ibstock, which is out of the River Mease SAC catchment.	No relationship	A	NA	A
Policy CS40 **Kegworth**	The policy relates only to development in Kegworth, which is out of the River Mease SAC catchment.	No relationship	A	NA	A

Policy	Possible impact pathways	Potential impacts	Pre-mitigation risk to River Mease SAC	Potential for mitigation	Post mitigation risk to River Mease SAC
Policy CS41 **Measham**	This policy directs a total of 550 homes to within the catchment of the River Mease SAC over the plan period. 440 of these still require planning permission. The policy also sets out other types of development that will be required in to support growth and this includes waste water generating uses, such as schools and health facilities. All new development will have to be served by the Packington Waste Water Treatment works that has limited remaining capacity.	Negative.	C	Proposals are in place to mitigate the impacts of development in Measham on the River Mease. This will require monitoring of the River Mease water quality and capacity at the Waste Water Treatment works. Where capacity is shown to be reached or where water quality has shown to have deteriorated no further development will be permitted until suitable measures. These include providing additional capacity or alternative solutions to waste water treatment at Measham Developers will be required to comply with the Developer Contribution Scheme to identify a long-term solution to the water quality risks. Development proposals may also require site specific appropriate assessment.	E
Policy CS42 **Rural Area**	This policy sets out the requirements for delivering development in the rural area. This could include new development in rural villages that are served by waste water treatment works on the River Mease. However, the quantity of development coming forward will be limited and this reduces the risk.	Possible negative	D	Development in parts of the rural area may have an impact on the River Mease SAC. Decisions will have to be made on a site by site basis. This will ensure that there is sufficient capacity in relevant waste water treatment works if it is shown that those supplying the development will drain to the Mease. Developers may be required to contribute to the Developer Contribution Scheme. In rare circumstance site specific appropriate assessment may be required.	A

Appendix 5

In-combination effects

Plan title	Purpose of plan and relevance to screened in Natura 2000 sites	Type of impact	Potential for significant in-combination impacts?	Commentary on impacts
NATIONAL PLANS				
National Planning Policy Framework (NPPF)	Provides national policy, guiding development to help achieve sustainable development. These include contributing to protecting and enhancing our natural environment and improving biodiversity and minimising pollution. The NPPF states that planning system should enhance the natural environment and prevent both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of water pollution.	Positive and negative	No	This plan sets the framework for development in North West Leicestershire. However, it is implemented through the local authority local plan.
Technical Guidance to the NPPF	Sets out guidance relating to flood risk and minerals planning. Flood risk guidance sets out the flood zones, Sequential Test, Exception Test and need to Strategic Flood Risk Assessments.	Positive and negative	No	This plan sets guidance for development of mineral sites or sites subject to flood risk in NW Leicestershire. However, it is implemented through the local authority local plan.
Environment Agency – Catchment Flood Management Plans	Developed with the aims of: • Understanding the factors that contribute to the flood risk within the catchment, such as land use • Recommending the best ways to manage the flood risk within the catchment over the next 50-100 years.	Neutral	No	These plans will be subject to HRA and will need to take into account relationship with the local plan.
LOCAL AND REGIONAL				
Leicestershire Waste Development Framework (Core Strategy &	The plan aims to provide a policy framework for delivering waste management facilities to help ensure the more sustainable use of waste. It	Neutral	No	Impacts on the SAC could occur if development occurs on (and expansion to) the existing waste site. However,

Plan title	Purpose of plan and relevance to screened in Natura 2000 sites	Type of impact	Potential for significant in-combination impacts?	Commentary on impacts
Development Control Policies) up to 2021	sets the framework for delivering waste management sites for each local authority in the area, and provides development control policies relating to waste facilities. One existing facility is located in the River Mease SAC, but the proposal broad locations are not located within or adjacent the River Mease catchment area.			the development management policies would mitigate any impacts at this location due to the European environmental designation.
Leicestershire Waste Development Framework (Site Allocations) up to 2021	Identifies landfill site allocation for 121 hectares for non-hazardous waste. The site is limited to its existing planning permission up to December 2014. The identifies that if planning permission was required then the environment would need to be protected from significant adverse impacts, including contamination of the water environment with particular emphasis on the River Mease.	Negative	Yes	If a planning application is submitted for the landfill site then an Appropriate Assessment will need to be made.
Leicestershire Minerals Development Framework (Core Strategy & Development Control Policies) up to 2021	The plan aims to provide a policy framework for minerals. It sets the mineral resources in the County and a framework for delivering mineral sites for each local authority in the area. Brick clay, sand clay and coal reserves are identified within the River Mease catchment area. Policy MCS11 states the strategy for the natural environment is that there are no unacceptable adverse impacts from minerals development on natural resources including water.	Negative	Yes	If a planning application is submitted for the landfill site then an Appropriate Assessment will need to be made.
Leicestershire Local Transport Plan 2011	The strategic transport plan for Leicestershire provides the long-term transport strategy and provides a framework for how the County will manage and develop the county's transport system in the future. The transport goals are: • A transport system that supports a	Positive and negative	Yes	There is the opportunity for the new transport schemes set out in the local transport plan to encourage car travel. This may have an adverse impact on the SAC site where increased road usage would increase water surface run-off.

Plan title	Purpose of plan and relevance to screened in Natura 2000 sites	Type of impact	Potential for significant in-combination impacts?	Commentary on impacts
	prosperous economy and provides successfully for population growth. • An efficient, resilient and sustainable transport system that is well managed and maintained. • A transport system that helps to reduce the carbon footprint of Leicestershire. • An accessible and integrated transport system that promotes equality of opportunity for all our residents. • A transport system that improves the safety, health and security of our residents. • A transport system that helps to improve the quality of life for our residents and makes Leicestershire a more attractive place to live, work and visit. The sets out strategic road improvements and seeks to reduce emissions from road transport.			However, the strategy also seeks to reduce car travel and encourage more sustainable transport; this objective has the potential to reduce adverse impacts.
National Environment Programme for PR09 (Environment Agency)	A key component of a periodic review is the National Environment Programme (NEP). The NEP is a list of environmental improvement schemes that ensure that water companies meet European and national targets related to water. Environment Agency produces the NEP after consultation with the water industry and a number of other organisations. Companies incorporate these requirements into their proposed business plans**,** which inform Ofwat's	Positive	No	The Environment Agency has identified several measures for Severn Water to take to protect the environment. This will impact on the River Mease SAC.

Plan title	Purpose of plan and relevance to screened in Natura 2000 sites	Type of impact	Potential for significant in-combination impacts?	Commentary on impacts
	decision on prices. The plan follows on from a review of Environment Agency consents and water companies' water resource plans. For the Severn Water areas the Environment Agency identifies improvement actions in relation to the Habitat Regulation Assessment where there evidence that there is a problem. The Environment Agency have identified an improvement action in relation to where they want to see an improvement to the environment without affecting the quantity of water the water company abstracts.			
Final Business Plan 2010-2015 Severn Trent	This sets out the goals for Severn Water over the next five years. This take into account maintaining their services whilst ensuring they remain affordable and protecting the environment. The plan includes a £2.6billion investment programme. The plan covers water supply and well as sewage and waste water treatment.	Positive	No	The impacts of this plan are likely to be positive as they take into account the Environment Agency recommendations for environmental protection, including of habitats.
Humber River Basin Management Plan (2009)	The Environment Agency produced the Management Plan which covers the SAC area. It includes measures proposed to achieve favourable conservation status and which organisation is responsible for implementing the measures.	Positive	No	The plan is likely to have positive impacts on the SAC.
The Tame, Anker and Mease Catchment Area Abstraction Management Strategy	As at 2008, the Environment Agency were investigating all abstractions on the water resources of the catchment are being investigated	Positive	Yes	As at 2008, the plan would have had likely positive impacts on the SAC.

Plan title	Purpose of plan and relevance to screened in Natura 2000 sites	Type of impact	Potential for significant in-combination impacts?	Commentary on impacts
(March 2008)	and at this time maintaining the current licensing strategy in which water may be available for abstraction in winter only. The strategy was to remain in place until any changes were made following the completion of the Habitats Directive investigations in 2010.			
Derby and Derbyshire Minerals Local Plan (2000, amended 2002) to be replaced by the Minerals Plan	The plan aims to provide a policy framework for delivering mineral workings. This plan will be replaced by the Mineral Plan which is currently being produced. Impacts of the new plan are currently unknown.	Negative	Potentially	Impacts on the SAC could occur if development occurs within the catchment area of the River Mease. Development management policies would mitigate any impacts at this location due to the European environmental designation. If a planning application is submitted for the minerals within the River Mease catchment area then an Appropriate Assessment will need to be made.
Derby and Derbyshire Waste Local Plan (2005) to be replaced by the Waste Plan	The plan aims to provide a policy framework for delivering waste management facilities. This plan will be replaced by the Waste Plan which is currently being produced. Impacts of the new plan are currently unknown.	Negative	Potentially	Impacts on the SAC could occur if development occurs within the catchment area of the River Mease. Development management policies would mitigate any impacts at this location due to the European environmental designation. If a planning application is submitted waste sites within the River Mease catchment area then an Appropriate Assessment will need to be made.
Staffordshire and Stoke-on-Trent Waste Local Plan to be replaced by Core	The plan aims to provide a policy framework for delivering waste management facilities. This plan will be replaced by the Waste Core Strategy	Negative	Potentially	Impacts on the SAC could occur if development occurs within the catchment area of the River Mease.

Plan title	Purpose of plan and relevance to screened in Natura 2000 sites	Type of impact	Potential for significant in-combination impacts?	Commentary on impacts
Strategy	which is at submission stage.			Development management policies would mitigate any impacts at this location due to the European environmental designation. If a planning application is submitted waste sites within the River Mease catchment area then an Appropriate Assessment will need to be made.
Staffordshire and Stoke-on-Trent Mineral Local Plan to be replaced by Core Strategy	The plan aims to provide a policy framework for delivering mineral works. This plan will be replaced by the Minerals Core Strategy which is currently being drafted.	Negative	Potentially	Impacts on the SAC could occur if development occurs within the catchment area of the River Mease. Development management policies would mitigate any impacts at this location due to the European environmental designation. If a planning application is submitted for the minerals within the River Mease catchment area then an Appropriate Assessment will need to be made.
Warwickshire Waste Local Plan to be replaced by the Core Strategy	The plan aims to provide a policy framework for delivering waste management facilities. This plan will be replaced by the Waste Core Strategy which is currently being drafted.	Negative	Potentially	Impacts on the SAC could occur if development occurs within the catchment area of the River Mease. Development management policies would mitigate any impacts at this location due to the European environmental designation. If a planning application is submitted waste sites within the River Mease catchment area then an Appropriate Assessment will need to be made.
Warwickshire Minerals Local Plan to be replaced by	The plan aims to provide a policy framework for delivering mineral works. This plan will be	Negative	Potentially	Impacts on the SAC could occur if development occurs within the

Plan title	Purpose of plan and relevance to screened in Natura 2000 sites	Type of impact	Potential for significant in-combination impacts?	Commentary on impacts
the Core Strategy	replaced by the Minerals Core Strategy which is currently being drafted.			catchment area of the River Mease. Development management policies would mitigate any impacts at this location due to the European environmental designation. If a planning application is submitted for the minerals within the River Mease catchment area then an Appropriate Assessment will need to be made.
DEVELOPMENT PLANS OF NEIGHBOURING LOCAL AUTHORITIES				
South Derbyshire Core Strategy	Development plan being jointly prepared with Derby City Council and Amber Valley District Council. Discussions with South Derbyshire District Council include the potential for extensions to Swadlincote, within NW Leicestershire, although this has not yet been confirmed.	Negative	Yes	If South Derbyshire District Council decide to allocate development in the River Mease catchment area, then this would result in a significant impact on the SAC, alone and/or in combination with other plans within NW Leicestershire and potentially other areas. South Derbyshire District Council are progressing behind NW Leicestershire in the production of their Core Strategy, therefore they would need to undertake a separate HRA relating to allocating sites in the Core Strategy. South Derbyshire would also need to enter into talks with the Environment Agency, Natural England, Severn Trent Water and NW Leicestershire Council.
Charnwood Core Strategy	Charnwood is east of the District and does not propose any development within the River Mease catchment area.	Neutral	No	No potential impacts. This plan will be subject to HRA and will need to take into account relationship with the local plan.

Plan title	Purpose of plan and relevance to screened in Natura 2000 sites	Type of impact	Potential for significant in-combination impacts?	Commentary on impacts
Hinckley and Bosworth Core Strategy	The Core Strategy was adopted in September 2009 and identifies 9000 homes to be built up to 2026, all of which will not be within the River Mease catchment area.	Neutral	No	No potential impacts. This plan will be subject to HRA and will need to take into account relationship with the local plan.
Rushcliffe Core Strategy	The draft Core Strategy proposes new homes and employment land outside the River Mease catchment area and therefore would not impact on the SAC.	Neutral	No	No potential impacts. This plan will be subject to HRA and will need to take into account relationship with the local plan.
North Warwickshire Core Strategy	The draft Core Strategy proposes new homes and employment land outside the River Mease catchment area and therefore would not impact on the SAC.	Neutral	No	No potential impacts. This plan will be subject to HRA and will need to take into account relationship with the local plan.
Lichfield Core Strategy	The draft Core Strategy proposes new homes and employment land outside the River Mease catchment area and therefore would not impact on the SAC.	Neutral	No	No potential impacts. This plan will be subject to HRA and will need to take into account relationship with the local plan.
Erewash Core Strategy	The draft Core Strategy proposes new homes and employment land outside the River Mease catchment area and therefore would not impact on the SAC.	Neutral	No	No potential impacts. This plan will be subject to HRA and will need to take into account relationship with the local plan.
PROJECT OR SITE SPECIFIC PROJECTS				
River Mease Water Quality Management Plan	This plan sets out the management actions to be implemented to work towards meeting conservation objectives. The plan includes actions and summary of how these actions will reduce phosphate in the River Mease. Management measures range from setting up management and technical groups, setting policies in the Core Strategy, establishing developer contribution strategy and monitoring	Positive	Yes	Potential for in-combination significant positive impacts on the SAC site.

Plan title	Purpose of plan and relevance to screened in Natura 2000 sites	Type of impact	Potential for significant in-combination impacts?	Commentary on impacts
	the headroom capacity and water quality			
Waste and mineral projects	Various proposals may come forward during the lifetime of the Core Strategy for minerals or waste proposals within the catchment area.	Negative	Yes	New or extended proposals to mining or waste have the potential to have in-combination impacts with the Core Strategy. National and Core Strategy policies will seek to protect the SAC site from harm. However, it will be necessary to review proposals on a site-by-site basis for indirect impacts, including impacts through cumulative harm.

Appendix 6

Severn Trent Water headroom assessment 2012

River Mease Catchment

Headroom assessment for sewage treatment works - 2012

1) Introduction

In accordance with the River Mease SAC Water Quality (Phosphate) Management Plan, Severn Trent Water has undertaken to provide regular updates on headroom availability at our sewage treatment facilities to inform planning decisions. This document sets out the sewage treatment headroom position as at March 2012 and replaces the document issued in December 2011. This information will be updated on an annual basis – the next scheduled update is March 2013.

2) Severn Trent Water's Statutory Duties

Severn Trent Water has a general duty under section 94 (clauses 1a and 1b) of the Water Industry Act 1991:

(a) to provide, improve and extend such a system of public sewers (whether inside its area or elsewhere) and so to cleanse and maintain those sewers and any lateral drains which belong to or vest in the undertaker as to ensure that that area is and continues to be effectually drained; and

(b) to make provision for the emptying of those sewers and such further provision (whether inside its area or elsewhere) as is necessary from time to time for effectually dealing, by means of sewage disposal works or otherwise, with the contents of those sewers.

In effect, this places an absolute obligation upon Severn Trent Water to provide such additional capacity as may be required to treat additional flows and loads arising from new domestic development. The complete Section 94 is included as appendix 1.

As a business, Severn Trent are specifically funded to discharge this legal obligation through our charging mechanism, as overseen by OFWAT through the five yearly Periodic Review process. Because Severn Trent is directly funded provide additional sewage treatment capacity to cater for new domestic development, the Company is unable to accept individual developer contributions towards increasing the capacity of a specific sewage works.

Severn Trent Water is also under a legal duty to comply with its sewage treatment works discharge consents, issued by the Environment Agency under the Water Resources Act 1991 (as amended by the Environment Act 1995). Should we be in a position of being unable to comply with a consent to discharge as a consequence of growth within the sewerage catchment, we are obliged to remedy the situation using our own resources.

3) Quantification of Headroom

As stated in Section 2 above, all of our sewage treatment facilities in the River Mease Catchment operate under effluent discharge consents, as issued by the Environment Agency. These consents specify both a volumetric limit (termed 'Dry Weather Flow') and limits on specific pollutants. [With the exception of Chilcote STW, which has a volumetric limit but operates under descriptive consent conditions.]

Quantification of 'Dry Weather Flow' is subject to specific definitions which are laid down by the Environment Agency in our discharge consents. An example of these conditions is attached as *appendix 2*. The difference between the measured DWF and the consented DWF is termed headroom.

There are a number of factors (in addition to new developments) that can affect the quantification of headroom such as:-

- Natural year on year variations in measured DWF
- Assessment of headroom against 80%ile or 90%ile measured flow
- Any changes in water consumption (domestic or trade)
- Closure of trade effluent dischargers (or increase in water reuse)
- Assumptions around water consumption in new build houses

It is for these reasons that the measured DWF and headroom figures quoted by Severn Trent Water in Section 5 below are central estimates based upon long term averages, not definitive numbers.

4. Dry Weather Flow Consent Conditions

The table below sets out the existing DWF consent conditions for the river Mease sewage treatment works. This incorporates some changes agreed in principle with the Environment Agency but not yet implemented.

Works	Current DWF m3/d	Agreed revision m3/d
Packington	4729	4656
Measham	1464	1390
Snarestone	420	
Edingale	113	
Clifton Campville	121	
Donisthorpe	725	
Overseal	455	
Netherseal	176	
Norton Juxta	60	
Smisby	50	
Chilcote STW	17	

5. Headroom

The table below sets out Severn Trent's central estimate of the number of new dwellings that can be accommodated at each of the river Mease sewage treatment works, before the consented DWF will be exceeded.

Works	Measured DWF (long term average)	Volumetric Headroom	Equivalent number of new dwellings
Packington	4320	336	1218
Meesham	1069	321	1163
Snarestone	406	14	51
Edingale	110*	3	11
Clifton Campville	93	28	101
Donisthorpe	670	55	199
Overseal	380	75	272
Netherseal	95	81	293
Norton Juxta	53	7	25
Smisby	34	16	58
Chilcote	n/a	n/a	<5[#]

* As previously reported, an error was identified with the flow recording device at Edingale in 2011. Whilst this error has now been corrected, the headroom assessment at Edingale STW has been made based upon a limited set of data.

Due to the very low DWF, Chilcote STW is not required to have permanent flow measurement installed. The headroom assessment provided of not more than 5 houses is an estimate as it is not possible to precisely quantify available headroom.

For reference purposes, the table below highlights the variance from the data included in the 2011 Headroom Assessment.

Works	Measured DWF variance % change (long term average)	Headroom increase from 2011 (m3/d)	Change in equivalent number of properties
Packington	-2.3	99	192*
Meesham	+1.6	-18	-65
Snarestone	-2.9	6	22
Edingale	n/a	n/a	-
Clifton Campville	-3.2	4	14
Donisthorpe	-1	6	22
Overseal	-2.1	7	26
Netherseal	-1.4	1	3
Norton Juxta	-2.9	2	7
Smisby	-4.9	2	7
Chilcote	n/a	n/a	-

*Net figure as an allowance previously made for water usage efficiency measures (metering) has been removed from 2012 headroom assessment.

Precautionary Principle

Technical compliance with our DWF consents is on the basis of 90%ile measured flow data. The headroom assessments in the table above have been based upon 80%ile flows. This has been done to give some protection against the measured DWF increasing in future years due to natural variation in rainfall.

6. Options Available to Severn Trent Water to increase headroom

As laid out in section 1 above, Severn Trent Water are legally obliged to make available such capacity as may be required to cater for new development. It is also clear in the legislation that we are not obliged to simply consider 'end of pipe' treatment solutions.

Severn Trent Water will work constructively with the relevant Planning Authorities, the EA and Natural England to ensure that all new developments within the River Mease catchment are delivered in such a way as to avoid any negative impacts on the SAC. In order to do this, we have set out below a number of options that are available to enable this to happen.

In the event that any of the works in the river Mease reaches a point whereby incoming flows exceed the consented volumetric consent, there are a number of options available to Severn Trent to restore compliance.

a) **Seek an increase in the relevant volumetric consent limit from the EA.**

In the context of the river Mease, Severn Trent would, as a minimum, expect the Environment Agency to apply 'constant load' principles such that any increase in a consented DWF is offset by a reduction in the polluting load parameters.

In the context of Phosphorus limits, there is a limit to which existing technology can be pushed whilst still delivering a compliant effluent. This is difficult to precisely quantify at the moment, because Phosphate stripping processes are not yet installed at all of the river Mease works, we are therefore unable to make informed comment on the extent to which we could comply with tighter Phosphorus limits. However, based upon experience elsewhere, marginal consent tightening (a few percentage points) is unlikely to prove insurmountable. However, this will need to be assessed on a case by case basis and our understanding of how far this option could be taken will improve over time (as our experience of operating the new phosphate stripping assets increases).

We acknowledge that the EA reserve the right to go beyond 'constant load'. In the event that a proposed consent tightening goes beyond what we believe we can actually deliver, we would necessarily have to explore other options.

b) **Local, within catchment, transfers**

Should the pattern of future development not match the availability of headroom at our works, we could explore the possibility of local sewerage catchment transfers between works within the Mease catchment to match supply and demand. As an example, Donisthorpe, Overseal and Netherseal STWs are all relatively close together and it may be feasible to transfer flows between these catchments.

c) **Catchment wide consent renegotiations**

Subject to agreement with the Environment Agency (and backed by Simcat river quality modelling), it may be possible to review sewage works discharge consents on a whole catchment basis to address a specific issue of a works exceeding its DWF. This could take one of two forms:-

i) A reduction in consented DWF at one or more sites (where headroom is available) to compensate for an increase in DWF at another.

ii) A tightening of the phosphate consent limits at one or more sites to offset an increase in phosphate discharge at another due to DWF exceedence.

d) **Transfer flows out of the River Mease Catchment entirely**

This could either be a transfer of crude sewage out of catchment to another sewage works (eg Ashby de la Zouche to Stanton STW) or a transfer of fully treated final effluent out of the river Mease and discharged directly to the river Trent.

Whilst this is technically a viable option for delivering the SAC conservation target, this would not be a preferred option for Severn Trent as it would have a significant carbon emissions implication. Also, significant transfer of final effluent out of the Mease catchment may also have undesirable implications for the river itself.

e) **Infiltration reduction**

It may be possible to offset the increase in flows due to development by implementing a programme of infiltration reduction within the sewer system as a whole. As with the 'out of catchment' option this is unlikely to be a preferred option with Severn Trent as it can be disruptive to our customers and expensive (and has a mixed track record of success).

Appendix 1

Section 94 of the 1991 Water Industry Act

94 General duty to provide sewerage system.

(1) It shall be the duty of every sewerage undertaker—

(a) to provide, improve and extend such a system of public sewers (whether inside its area or elsewhere) and so to cleanse and maintain those sewers and any lateral drains which belong to or vest in the undertaker as to ensure that that area is and continues to be effectually drained; and

(b) to make provision for the emptying of those sewers and such further provision (whether inside its area or elsewhere) as is necessary from time to time for effectually dealing, by means of sewage disposal works or otherwise, with the contents of those sewers.

(2) It shall be the duty of a sewerage undertaker in performing its duty under subsection (1) above to have regard—

(a) to its existing and likely future obligations to allow for the discharge of trade effluent into its public sewers; and

(b) to the need to provide for the disposal of trade effluent which is so discharged.

(3) The duty of a sewerage undertaker under subsection (1) above shall be enforceable under section 18 above—

(a) by the Secretary of State; or

(b) with the consent of or in accordance with a general authorisation given by the Secretary of State, by the Director.

(4) The obligations imposed on a sewerage undertaker by the following Chapters of this Part, and the remedies available in respect of contraventions of those obligations, shall be in addition to any duty imposed or remedy available by virtue of any provision of this section or section 95 below and shall not be in any way qualified by any such provision.

(5) In this section “trade effluent” has the same meaning as in Chapter III of this Part.

Appendix 2

Sewage works volumetric consent conditions

CONSENT NO.	T/23/35619/R

WATER RESOURCES ACT 1991

SECTION 88 - SCHEDULE 10

(AS AMENDED BY THE ENVIRONMENT ACT 1995)

NOTICE OF MODIFICATION OF CONSENT TO DISCHARGE

TO: Severn Trent Water Company Limited ("the Consent Holder")
2297 Coventry Road
Birmingham
B26 3PU

Following a review of the conditions of its consent, the **ENVIRONMENT AGENCY** ("the Agency") in pursuance of its powers under the Water Resources Act 1991 **HEREBY MODIFIES ITS CONSENT** to the making of a discharge **OF SEWAGE EFFLUENT**, as follows:

Treated Sewage Effluent

with respect to Modification of Consent No. T/23/35619/R served on the 14th day of October 2008.

FROM: Snarestone Sewage Treatment Works

AT: Appleby Road, Snarestone, Leicestershire

TO: The River Mease

FROM NOW ON the consent is modified as follows:

Substitution of condition 4 and 5, in Schedule T/23/35619/R 01 by the following new condition:

VOLUME

4 (a) The Dry Weather Flow of the discharge shall not exceed 420 cubic metres per day. The consented Dry Weather Flow limit is set at the Consent Holder's planned annual 80%-exceeded flow.

(b) In determining compliance with this consent, the measured Dry Weather Flow is that total daily volume that is exceeded by 90% of the recorded measured total daily volume values in any period of 12 months.

(c) The numeric value of the measured Dry Weather Flow shall not exceed the numeric value of the consented Dry Weather Flow limit.

(d) If the measured Dry Weather Flow exceeds the consented Dry Weather Flow limit then the Consent Holder shall as soon as is practicable investigate the reasons for the exceedance. The Consent Holder shall report the reasons for the exceedance to the Environment Agency and the steps that it proposes to take to restore compliance. An exceedance of the Dry Weather Flow limit shall not be recorded as a failure if the Consent Holder takes appropriate steps to restore compliance.

(e) If the measured Dry Weather Flow exceeds the consented Dry Weather limit because of unusual rainfall during the 12-month period, then it will not be recorded as a failure of the Dry Weather Flow limit. For the purposes of this condition, unusual rainfall shall mean rainfall that causes significantly higher sewage flows during the three-month period that normally records the lowest flows.

(f) For unusual rainfall to be considered, the Consent Holder shall notify the Agency and provide supporting evidence as part of the normal specified data returns.

Appendix 3

Detailed Example of Headroom Calculation

The example below relates specifically to Packington STW at Ashby de la Zouche, but a number of the principles are applicable to other works within the river Mease Catchment.

Current Consent

The current Packington DWF consent is set at 4729 m3/d. This is in the process of being reduced to 4656 m3/d as part of a wider agreement with the EA concerning river Mease discharges. The calculations below are made on the basis of the lower figure.

Variability in measured Dry Weather Flows

The table below illustrates the natural variability in measured dry weather flows.

Year	2005	2006	2007	2008	2009	2010	2011
DWF m3/d (80%ile)	4575	4505	4367	5111	4456	4190	3828

In quantifying headroom, there are no defined rules set down to determine how many years of flow data should be used. Older data is clearly not going to be representative of any recent changes and developments. However, using a smaller, more recent subset of information runs the risk of being unduly optimistic as the period since 2009 has been unusually dry, with 2011 being exceptionally dry.

The table below illustrates how variable the headroom calculation can be depending upon how the historic flow data is treated.

	Average 80%ile flow (m3)	Headroom against consent (m3)
Straight 7 year average	4433	223
6 year average excluding 2008*	4320	336
Last 2 year average	4009	647

*2008 was an unusually wet year

Variability in Water Consumption in new properties

To translate the measured DWF headroom in cubic metres into a headroom in terms of number of new properties that can be accommodated, assumptions around occupancy rate and per capita water usage need to be made.

Office of National Statistics data gives an average occupancy rate of 2.35 people per property for the Ashby de la Zouche area.

Standard domestic per capita water consumption for the area is 135 l/h/d. This gives a total per property of 317 litres per day. However, should the sustainable housing per capita usage of 100 litres per day be imposed on new developments as a planning condition, total usage per property drops to 235 l/d.

Summary of assumptions and headroom calculations.

The table below illustrates how the quantification of headroom can be affected by the two variables outlined above.

	Worst Case	Central estimate	Best Case
Assumption 1	Use lowest volumetric headroom figure of 233 m3	Use mid-range volumetric headroom figure of 336 m3	Use best case volumetric headroom figure of 647 m3/d
Assumption 2	No application of sustainable homes standard (use standard 135 l/h/d)	Use average of normal and sustainable homes water usage (@276 l/prop/d)	Full application of sustainable homes water consumption (100 l/h/d)
Headroom (properties)	735	1218	2753

Precautionary Principle

Whilst technical compliance with our DWF consent is on the basis of 90%ile measured flow data, the headroom assessment above has been based upon 80%ile flows. This has been done to give some protection against the measured DWF increasing in future years due to natural variation in rainfall. As alluded to earlier in this document (and reflected in the measured flow data), 2009 - 2011 have been dry years. The 2011 90%ile flow for Packington STW is 3,753m3/d, some 903m3/d below the adjusted DWF consent.

Factors not included in this assessment

Trade effluent changes

Long term future of the trade effluent discharge from Arla Dairy. Severn Trent are aware that Arla have applied for planning permission to develop a major new facility near Aylesbury. This could have implications for the 700m3/d discharge coming to Packington from the existing factory in Ashby de la Zouche. Loss of this trade effluent discharge would make significant headroom available at Packington. However, it would be premature to incorporate this into any headroom calculations.

In addition, the calculations above do not take account of the recent closure of the Standard Soap factory in Ashby de la Zouch that was announced in late 2011. This factory formerly discharged around 20m3/d to the sewerage system.

Changes in water consumption at existing properties (demand management)

Severn Trent, in common with other water companies, practices demand management. As part of some ongoing work in this area, the company is looking at installing water meters on existing properties whenever they change ownership. Initially this will be taking place in 4 post code areas, one of which is in Ashby de la Zouche. In total, the company expects to install 10000 meters across the 4 areas. The predicted impact of installing a meter is to reduce domestic consumption by around 10%. Assuming that 25% of the meters are installed in Ashby and that the 10% reduction is achieved (against a current per property average usage of 317 l/d) then this could potentially deliver up to a 79m3/d reduction in DWF to Packington STW.

As this trial has now started, allowance for this has now been removed from headroom calculations, as the demand reduction benefits will now start to be represented in the measured DWF data. This will avoid any potential double counting of headroom.

Appendix 7

Note prepared by North West Leicestershire Council officers setting out capacity at Waste Water Treatment works and proposed growth levels at Ashby and Measham

RIVER MEASE AN EXPLANATION OF OUR APPROACH

Housing provision

Our approach to the distribution of housing in the Core Strategy is partly governed by issues associated with the River Mease SAC. Whilst the detailed Water Cycle Study has identified some potential ways forward (i.e. maintenance of load and improved treatment mechanisms at WwTW) we cannot be sure that these approaches could be achieved in the short term or if such approaches would be Habitat Regulations compliant, as these potential ways forward have not been subject to Habitat Regulations Assessment.

Therefore, we are proposing an approach which restricts the amount of new housing development in Ashby and Measham to that which would not exceed the current agreed headroom at the respective WwTW (1,218 Ashby (i.e. Packington)and 1,163 Measham).

As the Core Strategy covers the period 2006 to 2031 we will need to identify what the overall number of dwellings will be for each settlement for the whole period. We are proposing the following:

- Ashby – 1,400 dwellings
- Measham – 550 dwellings

However, we need to take account of what development has taken place since 2006 as such developments will (it is understood) have a connection to the appropriate WwTW and so will not come off the current headroom. The respective figures for 2006 to 31 March 2011 are:

- Ashby – 384 dwellings
- Measham – 42 dwellings

If these new dwellings are taken off the suggested settlement figures set out above this reduces the residual figure for the period 2011 to 2031 to:

- Ashby – 1,016 dwellings
- Measham – 508 dwellings

These last figures are within the headroom capacity for the respective WwTW (substantially in respect of Measham) and also allow for a reasonable buffer in the event that recorded P levels (for whatever reason) increase such that the headroom would be reduced.

We believe that this approach is Habitats Regulations compliant as the amount of development would be within the current headroom which is itself compliant with the Habitats Regulations by virtue of the fact that it is in accordance with the existing consent which has (retrospectively) been assessed as Habitats Regulations compliant (subject to the provisions of the water Quality Management Plan).

Consultation responses

The above note was consulted upon with the Environment Agency and Natural England on the 14th March 2012. The following responses were received:

Natural England (response dated 20th March 2012)

Hi Ian,

I have looked at your proposals for the Core Strategy and think that the explanations and the proposed text are all fine. From Natural England's point of view we are happy that this will enable your HRA to conclude that the housing levels proposed are in accordance with the requirements of the Habs Regs.

Rachel Hoskin

Lead Adviser

Land Use Operations Team

Natural England

Environment Agency (responses dated 20th March 2012)

Hello Ian,

Thank you for your e-mail and enclosure dated 14th March 2012.

Housing Provision

We agree with the maintenance of load approach and staying within the headroom of the WWTW, both of which you propose. Therefore I would say we agree with the view taken. The monitoring of available headroom and development approved and carried out is a task that will be undertaken by yourselves in consultation with Severn Trent Water Ltd.

Regards

Geoff Platts

Planning Liaison Officer

Environment Agency

Strategy approach

In view of the above considerations we are suggesting the following policy be included in the Core Strategy in terms of setting out what our approach is in respect of the River Mease SAC (note this is revised slightly from the earlier version following consultation with Natural England and the Environment Agency):

The Council will work with Natural England, the Environment Agency, Severn Trent Water and the development industry to improve the water quality of the River Mease Special Area of Conservation.

In order to achieve this, our strategy will be to only allow new development within the River Mease catchment where:

a) There is sufficient headroom capacity available at the Wastewater Treatment Works to which it is proposed that flows from the development will go and;

b) The proposed development is in accordance with the provisions of the Water Quality Management Plan including, where appropriate, the provision of infrastructure or water quality improvements proposed in a Developer Contributions Strategy.

In the event that there is no headroom capacity available, development will only be allowed where it can be demonstrated that the proposed development will not have an adverse impact upon the River Mease Special Area of Conservation.