

# River Mease Diffuse Water Pollution Plan

## 1. Plan coverage and contacts

	Details
Protected sites, designations and interest features	<p><b>River Mease SSSI Reasons for notification</b></p> <p>The River Mease represents a lowland clay river supporting nationally significant populations of spined loach <i>Cobitis taenia</i> and bullhead <i>Cottus gobio</i>, two internationally notable species of native freshwater fish with a restricted distribution in England.</p> <p>The SSSI consists of four units:</p> <p>Unit 1 River Trent – Harlaston Bridge (5.93 ha)</p> <p>Unit 2 Harlaston Bridge - Netherseal (9.49 ha)</p> <p>Unit 3 Netherseal - Snarestone (5.27 ha)</p> <p>Unit 4 Snarestone - Packington (Gilwiskaw Brook) (2.19 ha)</p> <p>The SAC is coincident with the SSSI, and has the following reasons for designation:</p> <p><b>Annex I habitats that are a primary reason for selection of this site</b></p> <p>Not applicable</p> <p><b>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site</b></p> <p><u><b>Water courses of plain to montane levels with the <i>Ranunculion fluitantis</i> and <i>Callitricho-Batrachion</i> vegetation</b></u></p> <p><b>Annex II species that are a primary reason for selection of this site</b></p> <p><u><b>Spined loach <i>Cobitis taenia</i></b></u></p> <p>The River Mease is a good example of a riverine population of <b>spined loach <i>Cobitis taenia</i></b>. It is a small tributary of the River Trent and has retained a reasonable degree of channel diversity compared to other similar rivers containing spined loach populations. It has extensive beds of submerged plants along much of its length which, together with its relatively sandy sediments (as opposed to cohesive mud) provides good habitat opportunities for the species.</p> <p><u><b>Bullhead <i>Cottus gobio</i></b></u></p> <p>The Mease is an example of <b>bullhead <i>Cottus gobio</i></b> populations in the rivers of central England. Bed sediments are generally not as coarse as other sites selected for the species, reflecting the nature of many rivers in this geographical area, but are suitable in patches due to the river's</p>

	<p>retained sinuosity. The patchy cover from submerged macrophytes is also important for the species.</p> <p><b>Annex II species present as a qualifying feature, but not a primary reason for site selection</b></p> <p><b><u>White-clawed (or Atlantic stream) crayfish</u> <i>Austropotamobius pallipes</i></b></p> <p><b><u>Otter</u> <i>Lutra lutra</i></b></p>
<b>Natural England Contacts</b>	<p>SSSI Responsible Officer – Sadie Hobson  SSSI PSA Regional Delivery Leader – Jon Stewart  Regional freshwater &amp; pollution specialist – Ian Butterfield</p>
<b>Environment Agency Contacts</b>	<p>Water quality – Bev Allen  Fisheries – Chris Grzesiok  Conservation – Gill Walters/Chris Farmer  Environment Officer – Joe Adams</p>
<b>Others Contacts</b>	<p>Catchment sensitive farming officer - none  Stakeholder contacts - Mark Owen, Angling Trust</p>
<b>Purpose statement</b>	<p>Where diffuse pollution is preventing SSSIs from achieving favourable condition this plan will:</p> <ul style="list-style-type: none"> <li>• identify the causes, evidence of impacts and knowledge gaps;</li> <li>• identify remedies and plan when and how action will be taken;</li> <li>• identify the monitoring required to validate remedies.</li> </ul>

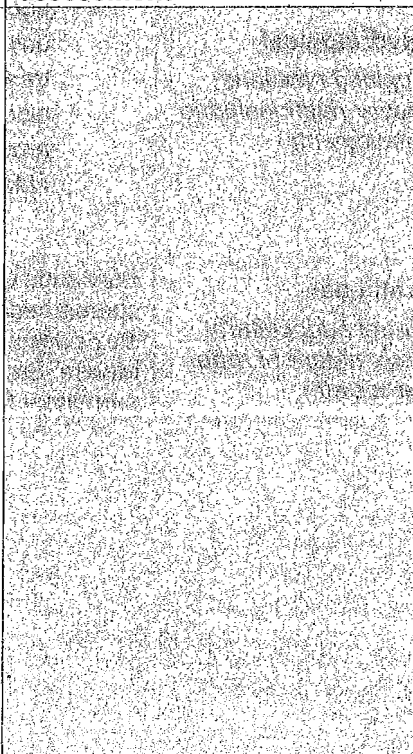
## 2. Characteristics of the catchment

Characteristics	Brief Description
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Characteristics	Brief Description
<p><b>Catchment</b> <i>(Location, geography, landscape etc)</i></p>	<p>The River Mease arises in North West Leicestershire and flows westwards through Derbyshire and Staffordshire for around 25 kilometres across a largely rural and agricultural landscape to its confluence with the Trent at Croxall. It represents a relatively unmodified lowland clay river with a diverse range of in-channel features, including riffles, pools, shoals, vegetated channel margins and bankside tree cover. Included in the designation are the lower reaches of the Gilwiskaw Brook which are steep and fast flowing with sparse aquatic vegetation. The upper reaches of the Mease, while mainly rural, also includes the small urban area of Measham. The middle reaches meander across the broad lowland floodplain. Submerged aquatic vegetation becomes more varied on the lower reaches of the river.</p> <p>Much of the area's geology is dominated by Triassic Mercia Mudstone which gives rise to productive reddish clay soils. There are also outcrops of older Triassic sandstones which support well drained sandy soils, particularly in the Mease lowlands and a raised plateau in Leicestershire which is underlain by Carboniferous Coal Measures, and which have been worked historically for coal. The River Mease catchment clay lowlands are characterised by extensive areas of arable cultivation with low, sparse hedges and few hedgerow trees.</p>
<p><b>Hydrological</b> <i>(upland / lowland, flows, relationship to geology etc)</i></p>	<p>The River Mease rises from a series of smaller streams around Norton-juxta-Twycross and flows in a northwesterly direction through agricultural land towards its confluence with the River Trent just downstream of Croxall. As well as discharges from smaller sewage treatment works (less than 10,000 population equivalent), the river also receives drainage from a few opencast coal mining operations around Moira. The Gilwiskaw Brook confluences with the River Mease at Measham, 2.7km downstream of Packington STW</p>
<p><b>Land use</b> <i>(rural / agricultural use, nature of urban areas etc)</i></p>	<p>Claylands characterised by extensive areas of arable cultivation with low, sparse hedges and few hedgerow trees. The landform is very gently rolling clay ridges and shallow valleys, becoming virtually flat around the River Mease. Small villages, generally on the crests of low ridges, are the most prominent feature of the landscape.</p>

Characteristics	Brief Description
<p><b>Sources of sewage</b> (no. / size of sewage treatment works, size of un-sewered population if possible)</p>	<p>As part of the fourth Water Company Asset Management Plan (AMP4), nutrient (phosphate) removal was to be installed at nine sewage treatment works that discharge to the River Mease catchment including Packington STW. These improvements are due to be delivered in relation to the designation of the River Mease as a candidate Special Area of Conservation (cSAC) under the Habitats Directive. As it stands, Packington STW is scheduled to receive a restricted phosphate limit of 1mg/l. When considered in-combination with improvements at the smaller works, this is predicted to reduce nutrient enrichment within the candidate area by more than the recommended 2mg/l limit that would be imposed under a successful sensitive area designation.</p> <p>Sewage Treatment Works at: Smisby, Donisthorpe, Packington, Measham, Netherseal, Edingale, Snarestone, Clifton Campville, Overseal, Norton juxta Twycross, Annwell Place, Chilcote.</p> <p>Private sewage operations at 10 sites? (SAP)</p> <p>Given the largely rural nature of the catchment, there is likely to be a significant number of properties not connected to mains sewage and using septic tanks.</p>

### 3. Monitoring attributes and compliance status

Measures	Status	Evidence used to support assessment
<p><b>Summary of pressures on SSSI condition</b></p>	<p>Water pollution: agricultural runoff</p> <ul style="list-style-type: none"> <li>- diffuse water pollution plan EA NE</li> <li>- HLS NE</li> <li>- Direct works, off-site HA</li> </ul> <p>Water pollution: discharge</p> <ul style="list-style-type: none"> <li>- discharge/PPC consent, RoC EA</li> </ul> <p>Siltation</p> <ul style="list-style-type: none"> <li>- river restoration plan EA NE</li> </ul> <p>Water abstraction</p> <ul style="list-style-type: none"> <li>- abstraction licence revoke/amend, RSA (RoC) EA</li> </ul>	

<b>Natural England's Conservation objective attributes</b>	<p>Conservation objectives are intended to maintain / restore the condition of the habitat / species for which a SSSI is designated.</p>	
	<p><b>Phosphate</b></p> <p>Orthophosphate levels: &lt;0.06 mg/litre as an annual mean</p> <p>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).</p> <p>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, affecting 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.</p> <p>Where modelling has been undertaken, the river should comply with the targets at all points along its length except within effluent mixing zones of acceptable size.</p>	<p>1) 2005 English interpretation of Common Standards Monitoring attributes. Note that CSM is to be reviewed which is likely to lead to a significant tightening of P attributes over existing levels;</p> <p>2) Interim phosphate guidance from Chris Mainstone developed for ROC;</p> <p>3) Attributes proposed for Common Standards Review</p>
	<p><b>Suspended solids</b></p> <p>No unnaturally high loads</p> <p>Spined loach and bullhead &lt;25 mg/litre annually</p>	
	<p><b>Siltation</b></p> <p>No excessive siltation. Maximum silt content &lt;20% in top 10cm of mid-channel gravels</p> <p>Channel should be dominated by clean gravels</p> <p><b>Spined loach:</b> Sand fractions in finer substrates reach at least 20% sand and no more than 40% silt</p> <p><b>Bullhead:</b> No excessive siltation on the surfaces of coarse substrates</p>	

	<p><b>Organic pollution</b></p>	
	<p><b>GQA Biology</b> – Class A/B for all reaches of the river</p> <p><b>GQA Chemistry</b> – Class A/B for all reaches of the river</p> <p><b>Un-ionised ammonia</b> - &lt;0.021 mg L-1 as a 95 percentile</p>	
	<p><b>Flow</b></p> <p>The regime should be characteristic of the river.</p> <p>Levels of abstraction should not exceed the generic thresholds laid down for moderately sensitive SSSI rivers by national guidance.</p> <p>Maximum acceptable % deviations from daily naturalised flows throughout the river:</p> <p>&lt;Qn 50 – 20%</p> <p>Qn 50-95 – 15%</p> <p>&gt;Qn 95 – 10-15%</p> <p>Ecological flow criteria already laid down for the river should also be complied with.</p> <p>There should be no obvious problems with water availability within the monitoring unit.</p>	
	<p><b>Macrophytes and Negative Indicators</b></p> <p><b>i) <u>Species Composition</u></b></p> <p>The following should all occur for river type II</p> <ul style="list-style-type: none"> <li>• At least 60% of species with abundance V or IV in the constancy table should be present,</li> </ul> <p>AND</p> <ul style="list-style-type: none"> <li>• At least 25% of species with abundance III should be present.</li> </ul>	

dominant in the initial baseline survey should still recorded as dominant.

**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 pectinatus*, *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*, *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

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 over 25% should be considered unfavourable, but should trigger further investigation.

Cover values should not increase significantly from an established baseline.

Negative indicators: alien/ introduced species

For aquatic and marginal macrophytes the presence of alien species listed in Appendix 10 of the **JNCCSM Guidelines for Rivers, March 2005** should be noted during the macrophyte survey and the scoring system for naturalness applied. 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

	<p>be 4 or 5 (see Appendix 10 of the <b>JNCCSM Guidelines for Rivers, March 2005</b>). i.e &gt;95% of aquatic and marginal macrophyte sp are native</p> <p>No other alien/introduced species present at levels likely to be detrimental to the characteristic biological community.</p>	
	<p><b>Other relevant conservation objective attributes</b></p> <p>No increase in pollutants potentially toxic to otters.</p> <p>No artificial barriers significantly impairing characteristic migratory species from essential life-cycle movements.</p> <p>Bullhead, reproduction/age structure: Length-frequency analysis of selected samples</p> <p>Young-of-year fish should occur at densities at least equal to adults.</p> <p>Four age classes with 0+ individuals at least 40% of population</p> <p>Largest females attain a fork length &gt;75mm</p> <p>Spined Loach, reproduction/age structure: Adult population densities &gt;0.2/m</p> <p>At least three year-classes should be present at significant densities. At least 40% of the population should consist of 0+ fish</p> <p>Largest females attain a fork length &gt;85mm</p> <p>White clawed crayfish: Population of at least moderate abundance</p> <p>(CPUE between 0.1 - 1)</p> <p>Berried females should be present during the period November to April</p> <p>Thelohianiasis (Porcelain Disease) should not affect &gt;10% population</p> <p>Absence of individuals infected with crayfish plague</p> <p>No artificial releasing of fish unless it is widely</p>	

	<p>agreed that this is in the best interests of the populations and then only with local stock.</p> <p>Fish introductions should not interfere with the ability of the river to support self-sustaining and healthy populations of characteristic species</p> <p>Maintain the characteristic physical features of the river channel, banks and riparian zone.</p> <ul style="list-style-type: none"> <li>• Slack water refuges should be present</li> <li>• Patches of high canopy tree cover should be present along channel banks with associated woody debris present within the channel</li> <li>• Unsilted coarse (gravel / pebble / cobble) dominated substrate should be present</li> </ul> <p><b>Channel form</b> Channel form should be generally characteristic of river type, with predominantly unmodified planform and profile.</p> <p>For planform the target is a score for the assessment unit of at least 3 (see <b>Appendix 4 of the JNCC CSM Guidelines for Rivers, March 2005</b>) i.e &lt;10% of ECS river artificial, re-aligned or constrained.</p> <p>For naturalness of the profile using transect data the target is a score for the assessment unit of 4 or 5 (see <b>Appendix 5 of the JNCC CSM Guidelines for Rivers, March 2005</b>). i.e &lt;0.2</p> <p>No RHS site to have any of the eight categories of bank profile modification (Section I in RHS 2003 form) recorded as 'extensive'.</p> <p>In-channel natural features present at frequent intervals (such as riffle/pool sequences, pools, slacks and submerged tree root systems)</p>	
<p><b>Water Framework Directive targets</b></p>	<p>GES/GEP by 2015 for the SAC designated Gilwiskaw Brook and River Mease. Derogation to 2021 or 2027 may be applied to the wider catchment, for example if disproportionately expensive, or technically infeasible (see Annex B and E of the Humber RBMP for details).</p>	

SAC WATERBODIES

GB104028046590 – Gilwiskaw Brook from Source to R Mease – POOR STATUS

GB104028046570 – R Mease from Gilwiskaw Brook to Hooborough Brook – MODERATE STATUS

GB104028046560 – R Mease from Hooborough Brook to River Trent – MODERATE STATUS

NON-SAC WATERBODIES

GB104028046550 - R Mease from Source to Gilwiskaw Brook – POOR STATUS

GB104028046580 – Hooborough Brook from Source to R Mease – MODERATE STATUS

WFD (2009 Classification) for Phosphate has a target of 0.12mg/l for the Mease catchment. Failures of that standard occur in all of the above waterbodies.

FISH: 2 waterbodies at High Status, 1 at Poor Status and 2 not assessed

Reasons For Failure: currently unknown

INVERTEBRATES: 1 waterbody at Good Status, 1 at Moderate Status and 2 at Poor Status

Reasons For Failure: Suspected Physical Modification – Land Drainage and Suspected Point Source Water Industry Sewage Works

MACROPHYTES: Not monitored

DIATOMS: Not monitored

AMMONIA: 4 waterbodies at High Status and 1 at Good Status

DISSOLVED OXYGEN: 5 waterbodies at High Status

pH: 5 waterbodies at High Status

TEMPERATURE: 5 waterbodies at High Status

#### 4. Review Schedule

	Details
<b>General recommendations</b>	The plans should be reviewed every three years during first two WFD cycles, thereafter every six years following SSSI condition assessment.
<b>Triggers for early review</b>	These include: <ul style="list-style-type: none"> <li>• New data providing robust evidence of contribution from diffuse sources;</li> <li>• Evidence indicating improvements are not being delivered as anticipated.</li> </ul>
<b>Monitoring / evidence gathering necessary to inform the review</b>	Retain current monitoring.

#### 5. Pressures and Impacts: evaluation of evidence

<b>Pressure (non-compliance with target)</b>	<b>Likely Sources (of the pressure). Specify nature of diffuse sources if possible</b>	<b>Confidence in likely sources / Evidence</b>	<b>Impacts being caused</b>

Pressure (non-compliance with target)	Likely Sources (of the pressure). Specify nature of diffuse sources if possible	Confidence in likely sources / Evidence	Impacts being caused
Diffuse Pollution	Agriculture, small point discharges and road/green lane run-off	<p>Confidence in these sources of information is very high/evidence:</p> <p>Catchment walk over survey to identify diffuse pollution and possible un-consented discharges – commissioned by NE</p> <p>Common Standards Monitoring survey – commissioned by NE</p> <p>Water quality results from brooks</p> <p>UK Coal water quality assessment</p> <p>Common Standards Monitoring Fish survey – commissioned by NE</p>	<p>Increased levels of P and N; elevated phosphorus levels interfere with competitive interactions between higher plant species leading to dominance by attached forms of algae. Deterioration of vegetative habitats and decline in abundance of macrophytes.</p> <p>The respiration of artificially large growths of benthic or epiphytic algae may generate large diurnal sags in dissolved oxygen in the water column and substrate which has a significant impact on mortality of fish, native crayfish and invertebrate species. Excessive benthic algal growth can also enhance trapping of fine sediments within riverine gravels, enhancing siltation and exacerbating poor substrate conditions.</p> <p>Increased levels of N lead to deterioration of bank side vegetation, leading to dominance of coarser species such as nettles etc.</p>

Pressure (non-compliance with target)	Likely Sources (of the pressure). Specify nature of diffuse sources if possible	Confidence in likely sources / Evidence	Impacts being caused
Siltation	Agriculture, road/ green lane run-off and small point discharges	<p>Confidence in these sources of information is very high/evidence:</p> <p>Catchment walk over survey to identify diffuse pollution and possible un-consented discharges – commissioned by NE</p> <p>Common Standards Monitoring survey – commissioned by NE</p> <p>Water quality results from brooks</p> <p>UK Coal water quality assessment</p> <p>Common Standards Monitoring Fish survey – commissioned by NE</p>	<p>Increased levels of siltation will cause widespread siltation of riverine habitats. Sediments caused by high particle counts will create reduced scour within the channel (due to artificial channel modifications such as weirs), a major threat to the characteristic river habitat (flora and fauna) and notified fish species.</p> <p>Many characteristic species of fish, invertebrates and plants are susceptible to siltation during their lifecycle. Mechanisms of impact can relate to reduced interstitial space in coarse substrates, reduced water flow through the substrate leading to poor water quality of interstitial waters. Sediment surface roughness eliminates refugia for animals with epibenthic habitats and prevents plant seeds and fragments from lodging in the substrate and taking root.</p> <p>Silt interferes with the establishment of Ranunculus plants and with egg and larval survival.</p>

<b>Pressure (non-compliance with target)</b>	<b>Likely Sources (of the pressure). Specify nature of diffuse sources if possible</b>	<b>Confidence in likely sources / Evidence</b>	<b>Impacts being caused</b>
Point source pollution	Sewerage treatment works within the catchment which are not operating at best available technology or small sewerage treatment works which do not need a discharge licence, therefore their output of P and SS is not regulated.	<p>Confidence in these sources of information is very high/evidence:</p> <p>Catchment walk over survey to identify diffuse pollution and possible un-consented discharges – commissioned by NE</p> <p>Common Standards Monitoring survey – commissioned by NE</p> <p>Water quality results from brooks</p> <p>UK Coal water quality assessment</p> <p>Common Standards Monitoring Fish survey – commissioned by NE</p>	As above

## 6. Additional available evidence

<b>Type of evidence or study</b>	<b>Owner</b>	<b>Detail</b>
River Mease SSSI and SAC Fish Survey – APEM (Feb 2010)	NE	Survey designed specifically with aim of sampling bullhead and spined loach, at 16 survey sites.
Condition Monitoring of Canal,	NE	Water quality assessment at 5

River and Open Water SSSIs in the East Midlands Area: Common Standards Monitoring Condition Assessment of River Mease SSSI – Scott Wilson (Jan 2010)		sites, and macrophyte/RHS/Phase 1 habitat survey at 4 sites
Data loggers		
RoC	EA	
FRB walkover	EA	
Macrophyte survey		
UK Coal study		

## 7. Catchment modelling

*Space should be left to incorporate output from the Environment Agency detailed catchment modelling for the ECSFDI and PSA projects when available.*

## 8. Measures and mechanisms already in place

<b>Measure and Pressure (the action required on the ground and which pressure from section 5 it will address)</b>	<b>Mechanism (the means of securing measures)</b>	<b>Location</b>	<b>Evidence supporting the expected outcome (positive or negative)</b>
Reduce sediment by enhancing riparian habitats to reduce siltation pressures	ELS and ELS/HLS	All units and catchment wide	Inventory of effects associated with various methods available in DEFRA DWPA Users Manual (Newell Price et al 2009). Use of HLS options need to be targeted and be site specific.
Reduce sediment run-off	Catchment Sensitive Farming (if chosen for a CSF target area)	All units and catchment wide	National CSF modelling project will be able to predict DWPA reduction based on advice delivered – if chosen for a CSF

			area
Reduce sediment run-off	NVZ compliance visits	All units and catchment wide	126 farms in catchment, 91 visited in previous years
Reduce sediment run-off through poaching	ELS/HLS	All units and catchment wide	Inventory of effects associated with various methods available in DEFRA DWPA Users Manual (Newell Price et al 2009). Use of HLS options need to be targeted and be site specific.
Reduce sediment run-off from arable land through resource protection options	ELS and ELS/HLS	All units and catchment wide	Inventory of effects associated with various methods available in DEFRA DWPA Users Manual (Newell Price et al 2009). Use of HLS options need to be targeted and be site specific.
Reduction of un-consented pollution incidents	EA regulatory action	All units and catchment wide	Report completed by Ruth Walker, Natural England confirms several un-consented discharges
Water Resources <ul style="list-style-type: none"> <li>- Acresford (STW Ltd)</li> <li>- Chilcote (SSW)</li> <li>- Spray irrigators MQU</li> </ul>	<ul style="list-style-type: none"> <li>- revocation of abstraction licence at Acresford pumping station</li> <li>- removal of emergency condition allowing abstraction of extra</li> </ul>	<ul style="list-style-type: none"> <li>- SSSI unit 3</li> <li>- SSSI unit 2</li> <li>- SSSI unit ?</li> </ul>	

	<ul style="list-style-type: none"><li>- water MOU with six abstraction licence holders who spray irrigate.</li></ul>		
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## 9. Additional measures required

No.	Measure and Pressure	Mechanism	Where is it needed? (refer to section 7 and any other relevant data)	What outcome is expected and what evidence is there it will be effective?	Action owners
i	Reduce sediment runoff using riparian fencing to address siltation pressure	Refreshed 'CSF' strategy post March 2011.	All SSSI units	Expect reduction in sediment runoff from target land holdings. CSF modelling supports effectiveness.	ECSFDI partnership.
ii	Reduce sediment runoff using riparian fencing to address siltation pressure	ELS and/or HLS	All SSSI units	Expect reduction in sediment runoff from target land holdings. CSF modelling supports effectiveness.	Natural England
iii	Prevent proliferation of package treatment works		All SSSI units		EA
iv	Address unconsented discharges, including those at the culvert in Ashby	Investigate/improve understanding of Ashby culvert	SSSI unit 4		EA
v	Address run-off pollution from A42		All SSSI units		EA
vi	Reduce sediment run-off from farm tracks to address siltation pressure	Refreshed 'CSF' strategy post March 2011, AND his	All SSSI units	Expect 5-10% reduction in sediment runoff from target land holdings. CSF modelling supports effectiveness.	CSF/ne
vii	Reduce phosphorus and nitrogen inputs from agriculture	CSF/HLS	All SSSI units	CSF modelling predicts an average reduction of 5% in phosphorus and up to 23% in nitrates in receiving waters	CSF/NE
viii	Review our farm visits and campaigns to share information and save resources to be more effective at influencing behavioural change	Piggybacking with other work	All SSSI units	Expect reduction of inputs of phosphate and sediments to watercourse, although not quantified	EA, NE


## 10. New evidence required to secure future mechanisms

Mechanism number (see section 9)	What evidence is needed and why?	Action owner
I	Sediment fingerprinting study	EA
li	Sediment fingerprinting study	EA
lii	Investigate current extent (no. and contribution) of package treatment works	EA
lv	Gather evidence on misconnections (Ashby). Investigate small point discharges (no., origin, significance)	EA
V	Investigate composition of run-off, and means of intercepting/treating it.	EA
Vi	Sediment fingerprinting study	NE
Vii	Review of long term monitoring (25 extra survey sites)	EA

## 11. Prioritised DWP action list

Action <i>(refer to measure no. / mechanism or evidence needed)</i>	Action type <i>(Enter: Advice, Incentive, Regulation or Evidence)</i>	Likely effectiveness <i>(based on section 9, enter High, Medium or Low Effectiveness)</i>	Cost / Ease of securing funding <i>(High, Medium or Low / Easy or Difficult)</i>	Burden of evidence <i>(High, Medium or Low)</i>	Priority for implementation	By who/when?
i. Reduce sediment runoff	<b>incentive</b>	<b>Medium</b>	<b>Medium-easy</b>	<b>Medium</b>	<b>high</b>	<b>Underway by</b>

using riparian fencing to address siltation pressure - CSF						2011 CSF
ii. Reduce sediment runoff using riparian fencing to address siltation pressure – ELS/HLS	Incentive	Medium	Medium-easy	Medium	high	Underway by 2011 NE
iii. Prevent proliferation of package treatment works	Regulation	High	Difficult	High	high	Underway by 2011 LA
iv. Address unconsented discharges, including those at the culvert in Ashby	Evidence	Medium	Difficult	High	high	Underway by 2011 EA
v. Address run-off pollution from A42	Regulation	Low	eASY	High	medium	Underway by 2012 HA
vi. Reduce sediment run-off from farm tracks to address siltation pressure	Incentive	Low	Medium	Low	high	Underway by 2011 CSF
vii. Reduce phosphorus and nitrogen inputs	Incentive	High	Medium-easy	Low	high	Underway by 2011

from agriculture						<b>CSF</b>
viii. Review our farm visits and campaigns to share information and save resources to be more effective at influencing behavioural change	<b>Advice</b>	<b>Medium</b>	<b>Medium-easy</b>	<b>Medium</b>	<b>High</b>	<b>Underway by 2011</b> <b>NE, EA</b>



## 12. Actions required on non-DWP sources

Issue / Remedy	Likely measures and mechanisms																														
RoC actions	In addition to consenting actions, EA and NE will: <ol style="list-style-type: none"> <li>1. Drive future improvements through tighter P limits</li> <li>2. Highlight risk to the SAC from development</li> <li>3. Work with Competent Authorities to improve diffuse pollution</li> </ol>																														
AMP Sewage Treatment Works	Improvements at STWs to reduce consented P limits: <table border="1"> <thead> <tr> <th>Sewage Works</th> <th>P limit</th> <th>Delivery Date</th> </tr> </thead> <tbody> <tr> <td>Snarestone AMP4 Completed</td> <td>1mg/l</td> <td>31/03/07</td> </tr> <tr> <td>Norton Juxta AMP4 Completed</td> <td>2mg/l</td> <td>31/03/07</td> </tr> <tr> <td>Donisthorpe AMP4 Completed</td> <td>1mg/l</td> <td>31/03/07</td> </tr> <tr> <td>Overseal AMP5</td> <td>1mg/l</td> <td>31/03/2013</td> </tr> <tr> <td>Netherseal AMP5</td> <td>2mg/l</td> <td>31/03/2013</td> </tr> <tr> <td>Measham - AMP5</td> <td>1mg/l</td> <td>31/03/2012</td> </tr> <tr> <td>Clifton Campville AMP5</td> <td>2mg/l</td> <td>31/03/2013</td> </tr> <tr> <td>Packington AMP5</td> <td>1mg/l</td> <td>31/03/2012</td> </tr> <tr> <td>Edingale AMP5</td> <td>2mg/l</td> <td>31/03/2013</td> </tr> </tbody> </table>	Sewage Works	P limit	Delivery Date	Snarestone AMP4 Completed	1mg/l	31/03/07	Norton Juxta AMP4 Completed	2mg/l	31/03/07	Donisthorpe AMP4 Completed	1mg/l	31/03/07	Overseal AMP5	1mg/l	31/03/2013	Netherseal AMP5	2mg/l	31/03/2013	Measham - AMP5	1mg/l	31/03/2012	Clifton Campville AMP5	2mg/l	31/03/2013	Packington AMP5	1mg/l	31/03/2012	Edingale AMP5	2mg/l	31/03/2013
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Local Development Framework	Production of water cycle study																														

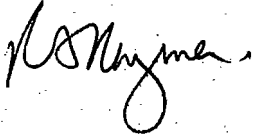
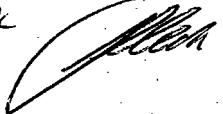
## 13. Monitoring

Type of monitoring	Action owner	Location	Frequency	For how long?
Sediment sourcing and nutrient modelling	EA	All units	One-off?	FY 2010/11?
25 extra sampling points	EA			
Review and redesign long term monitoring	EA	All units	Ongoing monitoring	Until review

UK Coal monitoring	UK Coal			
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#### 14. Sign Off

Natural England and the Environment Agency commit to work together to gather evidence and implement necessary remedy measures as guided by this plan, in order to maintain an improving trend in nutrients and sediment in the Mease catchment, so that SSSI condition targets are achieved in the future.

Organisation	Signed	Date
Natural England	 Rick Keymer	21 December 2010
Environment Agency	 SARAH COOK Suzanne Ward	4th January 2011