Danvm Drainage Commissioners Water Level Management Strategy Study - Strategic Environmental Assessment

Scoping Report
March 2014

The Coal Authority
200 Lichfield Lane
Mansfield
NG18 4RG

JBA Project Manager

Christopher Wright
Epsom House
Chase Park
Redhouse Interchange
Doncaster
DN6 7FE

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This report describes work commissioned by The Coal Authority. Michael Bradburn and Rachael Brady of JBA Consulting carried out this work.

Prepared by ..... Michael Bradburn BSc MSc
Assistant Ecologist

Reviewed by ..... Rachael Brady BSc MSc PGCert MCIEEM
Senior Ecologist

Purpose

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Abbreviations

AONB ..... Area of Outstanding Natural Beauty
AQMA ..... Air Quality Management Area
AQO ..... Air Quality Objectives
BAP ..... Biodiversity Action Plan
CAMS ..... Catchment Abstraction Management Strategy
CFMP ..... Catchment Flood Management Plan
CRT ..... Canal and River Trust
DDC ..... Danvm Drainage Commissioners
EA ..... Environment Agency

EH ..... English Heritage
EU ..... European Union
FRA..... Flood Risk Assessment
GI ..... Green Infrastructure
HAP..... Habitat Action Plan
IDB ..... Internal Drainage Board
JBA ..... Jeremy Benn Associates
JNCC ..... Joint Nature Conservation Committee
LBAP ..... Local Biodiversity Action Plan
LCA ..... Landscape Character Area
LERC ..... Lincolnshire Environmental Records Centre
LFRMS..... Local Flood Risk Management Strategy
LLFA ..... Lead Local Flood Authority
LNR..... Local Nature Reserve
LWS ..... Local Wildlife Sites
LWT ..... Local Wildlife Trust
NCA ..... National Character Area
NE ..... Natural England
NNR ..... National Nature Reserve
ODPM ..... Office of the Deputy Prime Minister
SAC..... Special Area of Conservation
SAP..... Species Action Plan
SEA..... Strategic Environmental Assessment
SINC ..... Site of Importance for Nature Conservation
SPA..... Special Protection Area
SSI ..... Site of Scientific Interest
SSSI..... Site of Special Scientific Interest
WLMP ..... Water Level Management Plan
WLMS ..... Water Level Management Strategy

1 Introduction

1.1 Background

JBA Consulting was commissioned by the Coal Authority, working in partnership with the Danvm Drainage Commissioners (DDC) and the Environment Agency (EA), to undertake a Strategic Environmental Assessment (SEA) as part of the Water Level Management Strategy (WLMS) currently being produced for the Danvm drainage district. It has been recognised that it may be possible to manage the drainage district more effectively and economically by reviewing the discreet pumped catchments within the district. For example, by linking pumped catchments together the number of pumping stations could potentially be reduced, which in turn will reduce the associated expenditure.

1.2 Purpose of SEA

The aim of the SEA is to identify potentially significant environmental effects created as a result of the implementation of the strategy on issues such as “biodiversity, population, human health, fauna, flora, soil, water, air, climate, material assets including architectural and archaeological heritage, landscape and the interrelationship between the above factors” (Annex 1(f), European Directive 2001/42/EC).

1.3 Legislative Regime

The European Directive 2001/42/EC requires that an Environmental Report be produced for those plans or programmes requiring SEA which includes information on the "relationship [of the plan or programme] with other relevant plans and programmes" (Annex I(a)), in addition to relevant "environmental protection objectives, established at international, [European] community or [national] level" (Annex I (e)).

The Directive was transposed into English legislation by the Environmental Assessment of Plans and Programmes Regulations 2004 (the ‘SEA Regulations’). The SEA Regulations form the basis by which all SEAs are carried out to assess the effects and impacts of certain plans and programmes on the environment.

In conjunction with practical guidance on the European Directive 2001/42/EC - Office of the Deputy Prime Minister (ODPM) Government publication, *A Practical Guide to the Strategic Environmental Assessment Directive* (ODPM, 2005) was issued.

1.4 The Water Level Management Strategy

The purpose of the WLMS is to review the operation of the water level management assets within the Danvm drainage district, with the aim of identifying efficiencies in operation which will have a consequent reduction on costs to the operating and funding authorities. The review will include assets managed by the Coal Authority and the DDC as well as those managed by other stakeholders including the Environment Agency (EA), Canal and River Trust (CRT), the relevant local authorities and the water and sewerage companies.

The study will largely concentrate on water level management rather than flood risk assessment as the latter has been studied by the EA with regard to Main Rivers through Catchment Flood Management Plans (CFMPs) and by the Lead Local Flood Authorities (LLFAs) in carrying out their Preliminary Flood Risk Assessments (FRAs) as required by the Flood and Water Management legislation.

The WLMS will result in proposals for the detailed study of assets in key specific areas in order to quantify potential cost savings in maintenance and/or capital expenditure. The results of the further studies will allow the WLMS to be finalised to include firm recommendations for future works and expenditure. The potential results of the studies are:

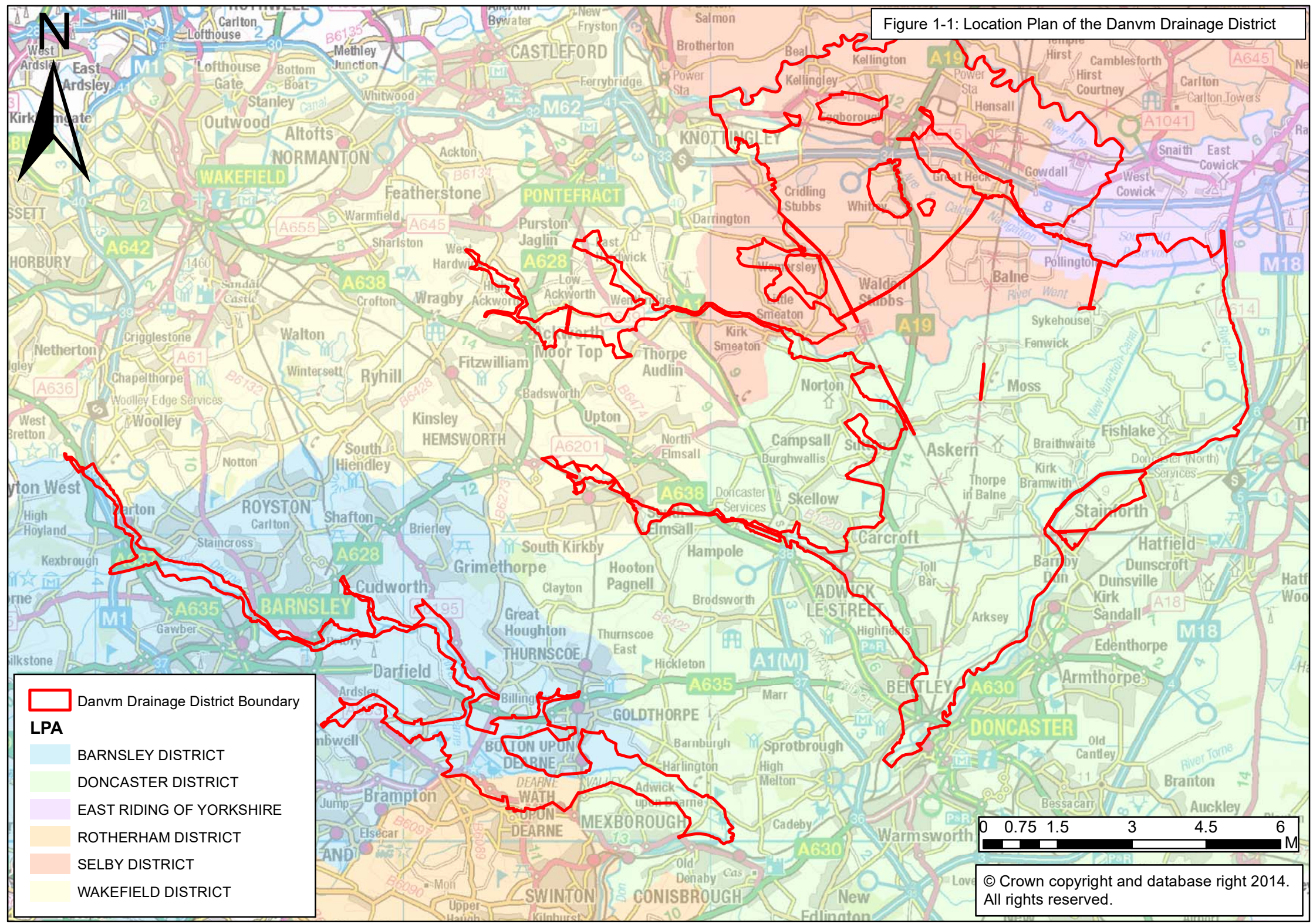
- Review of all relevant water level management assets and activities within the Danvm drainage district
- Provision of details of current capital works programmes
- Assessment of the potential for reduction of future expenditure whilst retaining drainage standards
- Production of a water level management strategy

- Identification of specific opportunities for cost savings for further study

1.5 The Study Area

The DDC was formed in 2012 following the amalgamation of the Dearne and Dove IDB, Dun Drainage Commissioners, Knottingley to Gowdall IDB and the Went IDB. The area administered by the DDC primarily includes the low lying areas of agricultural land north of Doncaster up to, and as far north as, the River Aire, North Yorkshire. To the east, the drainage district extends as far as the M18 Motorway at Thorne, and an additional arm of the district extends west from Mexborough to Darton. In its entirety the district covers an area of 21,526ha. Figure 1-1 shows the extent of the district and also the local authority areas it falls within.

Figure 1-1: Location Plan of the Danvm Drainage District



2 SEA Process and Methodology

2.1 Meeting the requirements of the SEA Directive

SEA involves the systematic identification and evaluation of the potential environmental impacts of the WLMS. This information is then used to aid the selection of a preferred option(s) for the strategy, which are those that best meet its economic, environmental and social objectives, and legal requirements.

The full range of environmental receptors has been considered when developing the scope of the SEA. This meets the requirements of the SEA Directive, which requires that an assessment identifies the potentially significant environmental impacts on 'biodiversity, population, human health, fauna, flora, soil, water, air, climatic, material assets including architectural and archaeological heritage, landscape and the interrelationship between the above factors'.

2.2 Stages in the SEA process

This report has been produced in conjunction with the SEA Regulations and follows the guidance contained within the OPDM *A Practical Guide to the Strategic Environmental Assessment Directive* (ODPM, 2005). In accordance with the process described in the guidance, this report identifies the context and objectives of the WLMS and determines the scope of the assessment is determined.

2.3 Scope of the SEA

2.3.1 Identifying other relevant policies, plans and programmes, and environmental protection objectives

The relationship between various policies, plans, programmes and environmental protection objectives may influence the WLMS. The relationships are analysed to:

- Identify any external social, environmental or economic objectives that should be reflected in the SEA process
- Identify external factors that may have influenced the preparation of the plan
- Determine whether the policies in other plans and programmes might lead to cumulative or synergistic effects when combined with policies in the plan.

The plans and programmes that need to be considered include those at the international, national, regional and local scale. These are identified and evaluated in Section 3.

2.3.2 Collecting baseline information

The SEA Directive identifies a range of environmental topics that must be considered for all environmental assessments; biodiversity, population, human health, fauna, flora, soil, water, air, climate, material assets including architectural and archaeological heritage, landscape and the interrelationship between the above factors.

Baseline information has been collected in relation to each of these topics, many of which are inter-linked. A desk study was undertaken to identify baseline environmental information, which was used to determine the key environmental characteristics of the drainage district. This information provides the basis for assessing the potential effects of the WLMS options and will aid development of appropriate mitigation measures, together with a future monitoring programme. The data search included information from a wide range of sources including the following organisations:

- Natural England
- Environment Agency
- Office for National Statistics
- English Heritage
- Met Office
- Multi-Agency Geographic Information for the Countryside (MAGIC) website

Where information is available, key environmental targets and objectives have been identified; established and predicted trends in the status or condition of environmental features have been

described; and significant environmental and sustainability issues have been highlighted. Trends evident in the baseline information have been used to predict the future baseline situation, which has assumed a continuation of the existing trends in some cases.

Table 2-1: Environmental topics to be covered in the SEA

SEA Directive requirements	Where covered in the Scoping Report	Definition in relation to this report
Air	Air quality	Air quality in relation to Government objectives
Biodiversity (including flora and fauna)	Biodiversity, flora and fauna	Protected, rare and notable species and habitats and designated sites
Climate	Climate	Regional climate patterns and future trends
Cultural heritage	Historic environment	Protected and notable heritage features
Human health	Population	Life expectancy
Landscape	Landscape and visual amenity	The local landscape character; protected and notable landscapes; key local landscape features
Material assets	Material assets	Critical infrastructure and Green Infrastructure
Population	Population	Human population size, age structure
Soil	Geology and soils	Variety of rocks, minerals and landforms; the quantity and distribution of high quality soil.
Water	Water environment	Chemical and biological water quality; water resources.
The interrelationship between the above factors	Throughout the Scoping Report	The relationship between environmental features and issues.

2.3.3 Identifying environmental issues and problems

The identification of significant environmental issues is an important step in establishing an appropriate assessment framework. Such issues have been identified directly through the baseline information search or by evaluating the relationship between the aims of the WLMS and the established environmental baseline.

2.3.4 Developing the SEA objectives

SEA objectives are a key tool used to assess the potential positive and negative environmental effects of the WLMS. Together with associated indicators, they form an assessment framework that provides a means to predict, describe and analyse the environmental effects that are likely to arise from the implementation of the strategy. The strategy objectives, options or proposed measures are appraised individually against each SEA objective, thereby allowing environmental, economic and social effects, in particular those which are significant, to be identified.

3 Other Relevant Policies, Plans and Programmes

3.1 Introduction

As part of the SEA process, an assessment of the integration of existing policies, plans and programmes on the WLMS has been undertaken. This is to address the requirement within the European Directive 2001/42/EC to determine the "relationship [of the plan or programme] with other relevant plans and programmes" (Annex I (a)), including, "environmental protection objectives, established at international, [European] community or [national] level" (Annex I (e)).

The ODPM SEA guidance recognises that no list of plans or programmes can be definitive. As a result all policies, plans and programmes which are considered relevant to the development of the WLMS have been identified in Table 3-1, with a more detailed review and assessment of the implications for the WLMS detailed in Appendix A.

Table 3-1: Policies, plans and programmes reviewed through this SEA process

Plan, Policy or Programme
International
EC Birds Directive – Council Directive 2009/147/EEC on the conservation of wild birds
EC Habitats Directive – Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora
EU Floods Directive – Directive 2007/60/EC on the assessment and management of flood risks
EU Groundwater Directive – Directive 2006/118/EC on the protection of groundwater against pollution and deterioration
EU Water Framework Directive – Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy
The European Landscape Convention (2000)
European Commission, Nitrates Directive (91/676/EEC)
European Commission, Ambient Air Quality Directive (2008/50/EC)
The Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983)
National
Air Quality Strategy for England, Scotland, Wales and Northern Ireland, 2007
Ancient Monuments and Archaeological Areas Act (1979)
Biodiversity 2020: A Strategy for England's Wildlife and Ecosystems (2011)
Building a Low Carbon Economy – the UK's Contribution to Tackling Climate Change (2008)
Cabinet Office, National Strategy Action Plan for Neighbourhood Renewal (2001)
Climate Change Act (2008)
Conservation of Habitats and Species Regulations (2010)
Contaminated Land (England) Regulations (2006)
Draft Water Bill (2012)
England Biodiversity Framework (2008)
Environment Act 1995
Flood and Water Management Act (2010)
Flood Risk Regulations (2009)
Future Water: the Government's water strategy for England (2008)
Heritage Protection for the 21st Century, White Paper (2007)
HM Treasury, Infrastructure UK – National Infrastructure Plan (2010)
Invasive Non-Native Species Framework Strategy for Great Britain (2008)
Land Drainage Act 1991 (as amended)
Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network, (2010)
Making Space for Water – taking forward a new Government strategy for flood and coastal erosion risk management in England (2005)
National Planning Policy Framework (2012)
National Wetland Vision (2008)

Plan, Policy or Programme
Natural Environment and Rural Communities (NERC) Act (2006)
Planning (Listed Buildings and Conservation Areas) Act 1990
Safeguarding our Soils – A strategy for England (2009)
Salmon and Freshwater Fisheries Act (1975)
Securing the Future – the UK Government Sustainable Development Strategy (2005)
The Carbon Plan (2011)
The Eels (England and Wales) Regulations 2009
The First Soil Action Plan for England (2004)
The National Flood and Coastal Erosion Risk Management Strategy for England (2011)
The National Flood Emergency Framework for England (2011)
UK Biodiversity Action Plan (2002)
Water Act (2003)
Water for Life, Water White Paper (2011)
Water for People and the Environment, Water Resources Strategy for England and Wales (2009)
Wildlife and Countryside Act 1981 (as amended)
Regional
Climate Change Plan for Yorkshire and the Humber 2009-2014
Heritage at Risk Register: Yorkshire and Humber (2011)
River Basin Management Plan Humber River Basin District (December, 2009)
South Yorkshire Green Infrastructure Strategy (2011)
The Historic Environment Strategy for Yorkshire and the Humber Region 2009-2013
The Humberhead Levels NIA, Nature Improvement Area Programme (2012)
The Yorkshire and Humber Biodiversity Delivery Plan 2010-2015
Local
Don Catchment Flood Management Plan Summary Report (2010)
Aire Catchment Flood Management Plan Summary Report (2010)
The Dearne Valley Green Heart NIA, Nature Improvement Area Programme (2012)
Local Biodiversity Action Plans (Doncaster, Selby, Barnsley, East Riding, Wakefield, Rotherham)
Danvm Drainage Commissioners Biodiversity Action Plan (2012)
Barnsley, Doncaster and Rotherham Joint Waste Plan (2012)
Local Development Framework documents (Doncaster, Selby, Barnsley, East Riding, Wakefield, Rotherham)
Doncaster Green Infrastructure Strategy 2014-2019 (Draft)
Doncaster's Environment Strategy (2012)
Geodiversity Action Plan for Doncaster (2008)
Selby Countryside and Green Space Strategy (2013)
East Riding of Yorkshire Rural Strategy 2013-2016
Preliminary Flood Risk Assessments (2011) (Doncaster, North Yorkshire, Barnsley, East Riding, Wakefield, Rotherham)
Lower Aire Flood Risk Management Strategy and SEA (2012)

3.2 Summary of the review

The key themes identified by this review are shown in Table 3-2. A summary of the policy documents and their relevance to the DDC WLMS is set out in Appendix A.

Table 3-2: Key themes of the policies, plans and programmes reviewed through this SEA process

SEA topic	Key themes
Landscape and visual amenity	Protecting sensitive landscape assets (including National Parks and AONBs); promoting the conservation and enhancement of natural beauty and amenity of important landscapes, including inland waters; definition and protection of regional and local landscape character; and the provision and enhancement of green

SEA topic	Key themes
	infrastructure to benefit people and the environment.
Biodiversity, flora and fauna	Protection of international and national designated sites and their qualifying features; preservation and enhancement of notable habitats and species, particularly those noted for their conservation value or under threat; identification of the roles and responsibilities of organisations including local authorities to protect and enhance biodiversity including the creation of BAP habitats and promotion of BAP species; provision of new/restored habitat to enable species to adapt to the future impacts of climate change.
Water environment	Promote the sustainable use of water resources to meet future growth in demand and impacts of climate change; better regulation and management of the water environment to benefit water resources and flood risk, and reduce water pollution.
Geology and soils	Long term protection, improvement and sustainable management of soil quality and quantity, including the preservation of best and most versatile land; and the management and remediation of contaminated land to reduce the risk to human health and the environment, particularly soils and water quality.
Historic environment	Protection and enhancement of nationally and locally important heritage assets and historic landscapes; better integration of heritage protection within the planning regime; and providing better access to heritage sites including their promotion as an economic asset.
Population	Protect and improve human health, wellbeing and living standards; greater integration of socio-economic and environmental objectives to deliver sustainable development; promotion of prosperous, sustainable and coherent communities; provision of better public transport and access; reduction of flood risk; enhancement of recreation and amenity resources to benefit health and wellbeing; and development and provision of measures to enable adaptation to the impacts of climate change.
Material assets	Improvement and better management of material assets including highways and utilities infrastructure; greater provision and enhancement of green infrastructure to deliver benefits to people and the environment; and provision of better public services to deliver socio-economic benefits.
Air quality	Protection of air quality in urban areas through enhanced management of polluting emissions.
Climate	Requirements to reduce future greenhouse gas emissions across all socio-economic sectors to limit the impacts of climate change of people and the environment; and provision of measures to enable future adaptation to the impacts of climate change and increase resilience.

4 Environmental Characteristics and Key Issues

4.1 Introduction

A desk based study for baseline environmental data (including biological, geological and social) was undertaken to identify the key environmental characteristics within the Danvm drainage district.

The baseline information may require updating throughout the duration of the SEA process as the WLMS is developed further and new information becomes available.

4.2 Landscape and visual amenity

There are no Areas of Outstanding Natural Beauty (AONB) or National Parks located within the drainage district.

The Danvm drainage district falls within three National Character Areas (NCAs):

- Humberhead Levels – a predominantly flat agricultural landscape. Much of the area is extremely low-lying, with some areas lying at or below the mean high-water mark. The landscape includes the broad floodplains of several major rivers which drain to the Humber.
- Southern Magnesian Limestone - this landscape is formed by the two escarpments of the Upper and Lower Magnesian Limestone, which stretch from near Bedale, running southwards through South Yorkshire and into Derbyshire where they terminate near Nottingham. The escarpments form quite a narrow ridge feature which acts as a distinct barrier between the industrial coalfields and the Yorkshire Dales fringe to the west and the lowland vales to the east.
- Nottinghamshire, Derbyshire and Yorkshire Coalfield – a large landscape area which embraces the major industrial towns and cities as well as a substantial slice of the countryside and the villages of the Nottinghamshire, Derbyshire and Yorkshire coalfields. The landscape is underpinned by generally low and un-dramatic but variable hills, escarpments and broad valleys.

Furthermore, the district contains a number of locally designated Landscape Character Areas (LCA) which are described in Table 4-1.

Table 4-1 Landscape Character Areas within the Danvm Drainage District. Information from DMBC (2007), NYCC (2011) and ERYC (2005)

LCA Name	Description
Doncaster Landscape Character Assessment and Capacity Study	
Tollbar Settled Clay Farmlands	Is mostly flat and is associated with the silts and clays of the Vale of York drift over Sherwood sandstones. The generally heavy nature of the soils together with the once seasonal flooding from the nearby River Don resulted in small scale pastoral agriculture. Cultivation of fields for arable crops in medium to large fields; and subsequent removal of hedges creating a very open landscape.
Owston to Sykehouse Settled Clay Farmlands	This area is located between the River Don to the east and the rising limestone plateau to the west. The flat, simple landscape has views of large skies and a feeling of openness although ground level views are curtailed by hedgerows and trees. It is underlain by the clays of the Vale of York drift over Sherwood sandstones. The heavy soils together with the once seasonal flooding with from the Rivers Went and Don has resulted in small scale pastoral agriculture with some hay fields and many thick species rich hedgerows which also contain frequent mature hedgerow trees. Some larger arable fields have been created by amalgamating fields which typically have more fragmented hedges, but the small scale landscape pattern is largely intact. The area contains a network of water-filled drains sometimes forming field boundaries.
Dearne Coalfield River Corridor	The River Dearne which is lined by flood embankments along much of its length takes a gently curving course along the flat valley floor. The river is lined by trees and beyond the flood embankments is arable farmland in an irregular patchwork of varied field sizes with missing or fragmented hedges. A meandering watercourse branched off from the main river feeds a wetland which is a nationally important site for

LCA Name	Description
	nature conservation.
Don Limestone River Valley	It is a small scale and picturesque landscape enclosed along its northern and southern boundaries by the moderately to steeply wooded valley sides, which direct views along the valley. The floor of the valley is flat and narrow, widening in places where the river meanders. There are also some water bodies alongside the river such as the large Sprotborough Flash. There are many embankments and weirs containing and controlling the river. The river is navigable and is frequented by many canal boats. It is popular for other recreational activities including fishing and walking along the riverside footpath. The Trans Pennine Trail runs along the length of the LCA.
Hampole Limestone River Valley	This area is defined by the valley bottom associated with the confluence of two small waterways which run over sand and gravel drifts underlain by magnesium limestone. The watercourses are bounded by an irregular pattern of small to large scale gently sloping arable fields. Some fields have intact hedges with some hedgerow trees and other hedges are missing. A railway line runs along the length of the LCA and the major A1 road crossed the valley on a flyover which physically and visually divides the more rural western section from the slightly more diverse eastern side.
West Don and Dun River Carrlands	This LCA consists of the flat floodplain of the Rivers Don and Dun Navigation which run along the length of the LCA. Flood embankments which have mown grass contain and separate the watercourses. The manmade nature of the water courses and visual references to past industrial uses of the watercourse such as the disused loading platforms on the canal; and also to power generation and distribution, give this landscape a unique and distinctive character.
East Don and Dun River Carrlands	This landscape is defined by the sand and gravel deposits and flat floodplain landform associated with the Rivers Don and Dun Navigation. It is a medium scale, agricultural landscape characterised by arable farmland and pockets of unimproved pasture, in geometric fields with an irregular pattern. There are fragmented hedges interspersed with mature trees and a network of drains on field boundaries. Trees are also found in places alongside the watercourses and as infrequent small blocks of deciduous woodland.
Blaxton to Stainforth Sandland Heaths and Farmland	This LCA is a flat floodplain bounded by the Don Navigation Canal in the west; Thorne in the north; Thorne and Hatfield Moors in the east and the rising land south-west of Robin Hood Airport. The underlying geology is Sherwood sandstone overlain by gravel and sand drifts, which give rise to sandy stony soils, areas of occasional heathland such as Blaxton Common, and a few remaining roadside patches of heathland bracken and gorse in the drier areas.
Went Limestone River Valley	This small area is defined by the gently sloping valley bottom associated with the River Went which runs over sand and gravel drifts underlain by magnesium limestone. It has a strongly rural and simple character with some historic stone buildings at Norton Priory. The narrow River Went meanders gently through the valley and is bounded by a strip of deciduous trees. The farmland adjacent to the river is very gently sloping and is not large enough to exhibit a repeating pattern of fields. There are small fields of pasture next to the river and beyond that are small to medium arable fields.
North Yorkshire and York Landscape Character Assessment	
Magnesian Limestone Ridge	This low, gently rolling limestone ridge is covered with a patchwork of fertile, predominantly arable fields which are often delineated by a network of mature hedgerows and drystone walls. Patches of semi-natural woodland are features of the steeper slopes. Wooded estates, which often contain historic buildings, are also a key feature of this area. These estates often have an intricate character, which contrasts with the surrounding agricultural landscape. The corridor of the A1(M) runs along much of the length of the ridge.
Levels Farmland	This is a predominantly flat agricultural landscape. Much of the area is extremely low-lying, with some areas lying at or below the mean high-water mark. Historically, this would have been a very wet landscape. Field trees and hedgerows are generally few and far between and views are often long and unbroken to distant horizons, with the sky playing an important part. Settlement

LCA Name	Description
	is limited and generally concentrated on higher ground, but within the open levels there are scattered, large, often semi-industrial farmsteads with large modern buildings. The long history of drainage and water management is evident in many areas with dykes, berms, bridge crossings and disused windmills and water towers.
River Floodplain	The courses of rivers within this Landscape Character Type are often lined with trees and lush, diverse vegetation. In places, the river corridors are therefore relatively enclosed, resulting in an intimate scale in contrast to the open exposed nature of the adjacent flood meadows and lowland landscapes. The flat alluvial soils of the wide river margins have given rise to the fertile 'Ings' lands where animals have been grazed and hay harvested for many centuries. This historically rich habitat is also notable for its considerable nature conservation value including flood meadows, neutral grasslands and floodplain mires. Traditional management of communal haymaking and grazing is still carried out at a few sites.
East Riding Landscape Character Assessment	
M62 Corridor Farmland - Hook to Pollington	The area is intensively farmed and there are very few trees of woods in this area except for planting associated with the motorway and its junctions. The Aire and Calder Navigation and Dutch River are prominent linear features in the area pronounced by the embankments that enclose them. Their banks are grazed in contrast to the cereal crops grown in adjacent fields.

Key environmental issues

Water level management has the potential to affect the local landscape characteristics in the Danvm drainage district. This includes impacts on existing character areas and on the setting of local landmarks and landscape features. Many of these aspects are protected through regional and local policies and as such could constrain the implementation of WLMS options/measures if they are shown to present a risk to the quality of the local landscape.

4.3 Biodiversity, flora and fauna

The Danvm drainage district contains a variety of habitats, including, predominantly, agricultural land, but also grasslands, woodland, and a wide range of wetland habitats. Many UK Biodiversity Action Plan (BAP) priority habitats are identified within the Danvm drainage district, including arable field margins, hedgerows, wet woodland, lowland calcareous grassland, lowland fens, purple moor grass and rush pasture, reedbeds, floodplain grazing marsh, lowland meadows, rivers, eutrophic standing waters and ponds (MAGIC, 2013). Many wetlands have been created as a result of mining subsidence.

Habitats within the Danvm drainage district support a wide range of flora and fauna. The district supports fragmented populations of Water Vole *Arvicola amphibius*, with recent projects being undertaken by the Yorkshire Wildlife Trust to improve the habitat for this protected/BAP species within and around the Ea Beck and also in the upper Went catchment, near Ackworth. Other protected and/or BAP species of mammal recorded within the district include Otter *Lutra lutra*, Brown Hare *Lepus europaeus* and several species of bat *Chiroptera sp*.

Numerous bird species have been recorded within the district; those which could be potentially impacted upon by the actions of the DDC include Reed Bunting *Emberiza scheoeniclus*, Curlew *Numenius arquata* and Lapwing *Vanellus vanellus*. There are also several records of Barn Owl *Tyto alba*, mostly associated with next box schemes along the River Aire and the canal network. The DDC have Barn Owl next boxes at three pumping station sites, all of which have shown indications of being in use. The Barn Owl is protected under Schedule 1 of the Wildlife and Countryside Act 1981 (as amended).

Protected and/or notable amphibian and reptile species have also been recorded within the district, including Grass Snake *Natrix natrix*, Common Toad *Bufo bufo* and Great Crested Newt *Triturus cristatus.* Great Crested Newts are quite common throughout the district, particularly within the borrow pits adjacent to the Ea Beck and in field ponds in the Fishlake/Sykehouse area.

The Fishlake area also supports a number of notable plant species including True Fox Sedge *Carex vulpina*, Stone Parsley *Sison amomum* and the locally rare Spurge-laurel *Daphne laureola*.

Several species of non-native plant have been recorded within the district including New Zealand Pygmyweed *Crassula helmsii,* Canadian Waterweed *Elodea canadensis,* Japanese Knotweed *Fallopia japonica* and Himalayan Balsam *Impatiens glandulifera.* The non-native American Mink *Neovison neovison* has also been frequently recorded along watercourses within the district.

Pumping stations and other structures within watercourses can be an impediment to fish movements. The WLMS could provide opportunities to improve fish passage throughout the district. This is particularly important for European Eel *Anguilla anguilla*, a UK BAP priority species.

4.3.1 Danvm Drainage Commissioners BAP

The Danvm Drainage Commissioners BAP identifies objectives for the conservation and enhancement of biodiversity within the drainage district, and goes on to describe targets and actions that will help to deliver these objectives. The action plan aims to safeguard the biodiversity of the drainage district now and for future generations. In particular, it is hoped that implementing the plan will contribute to the achievement of local and national targets for UK BAP priority species and habitats. The priority habitats and species identified in the Danvm Drainage Commissioners BAP are given in Table 4-2. As part of the BAP each habitat has a Habitat Action Plan (HAP) and each species has a Species Action Plan (SAP).

Water level management has the potential to significantly impact on these habitats and species. For example, Water Vole, are dependent upon aquatic and riparian habitats, and are sensitive to changes in habitat conditions, water levels, water quality, flow, vegetation cover and bank profile.

Table 4-2: Danvm Drainage Commissioners BAP habitats and species

BAP Habitats	BAP Species
Hedgerows	Water Vole
Floodplain Grassland	Otter
Drains and Ditches	Great Crested Newt
Ponds	Barn Owl
Subsidence Flashes	Lapwing

4.3.2 Designated nature conservation sites

There are no internationally designated nature conservation sites located within the Danvm drainage district.

There are eight nationally designated nature conservation sites located wholly, or partly, within the district; six Sites of Special Scientific Interest (SSSI) and two Local Nature Reserves (LNRs). These sites are described in Table 4-3 and shown on Figure 4-1.

Prior to amalgamation, the Dun Drainage Commissioners prepared a Water Level Management Plan (WLMP) for Shirley Pool SSSI and the Went IDB prepared WLMPs for Went Ings Meadows SSSI and Forlorn Hope Meadows SSSI. WLMPs provide a means by which the water level requirements for a range of activities in a particular area, including agriculture, flood defence and conservation, can be balanced and integrated. IDBs are required to produce a WLMP for all SSSIs where their activities could have an impact on the condition of the site (i.e. where the IDB maintains a watercourse, structure and/or pumping station which may influence the site).

Table 4-3: Statutory designated nature conservation sites within the Danvm Drainage District

Site Name	Designation	Features contributing to designation
Shirley Pool	SSSI	The site contains excellent examples of wetland habitats including open water, reed swamp, tall fen, wet neutral grassland and carr, which grades into birch-oak woodland on drier ground. The site is of high entomological value.
Went Ings Meadows	SSSI	The site constitutes the best example of unimproved neutral grassland in South Yorkshire. The meadows show a gradation from wet neutral grassland to tall fen vegetation with a rich flora. This site is also important for its unimproved neutral grassland and associated plant communities.
Forlorn Hope Meadows	SSSI	This site is important for its unimproved neutral grassland and associated plant communities.
Brockadale	SSSI	The site comprises the narrow, steep-sided valley of

Site Name	Designation	Features contributing to designation
		the River Went which cuts through Magnesian Limestone rocks of Permian age. The valley slopes include occasional outcrops and crags which are wooded, with areas of limestone grassland.
Denaby Ings	SSSI	One of the most diverse wetlands in the county. Rich in aquatic plant, invertebrate, and bird species.
Bretton Country Park	LNR	Grassland and lakes in former estate land.
Dearne Valley Park	LNR	Acidic oak woodland with mosaic of wetland habitats.

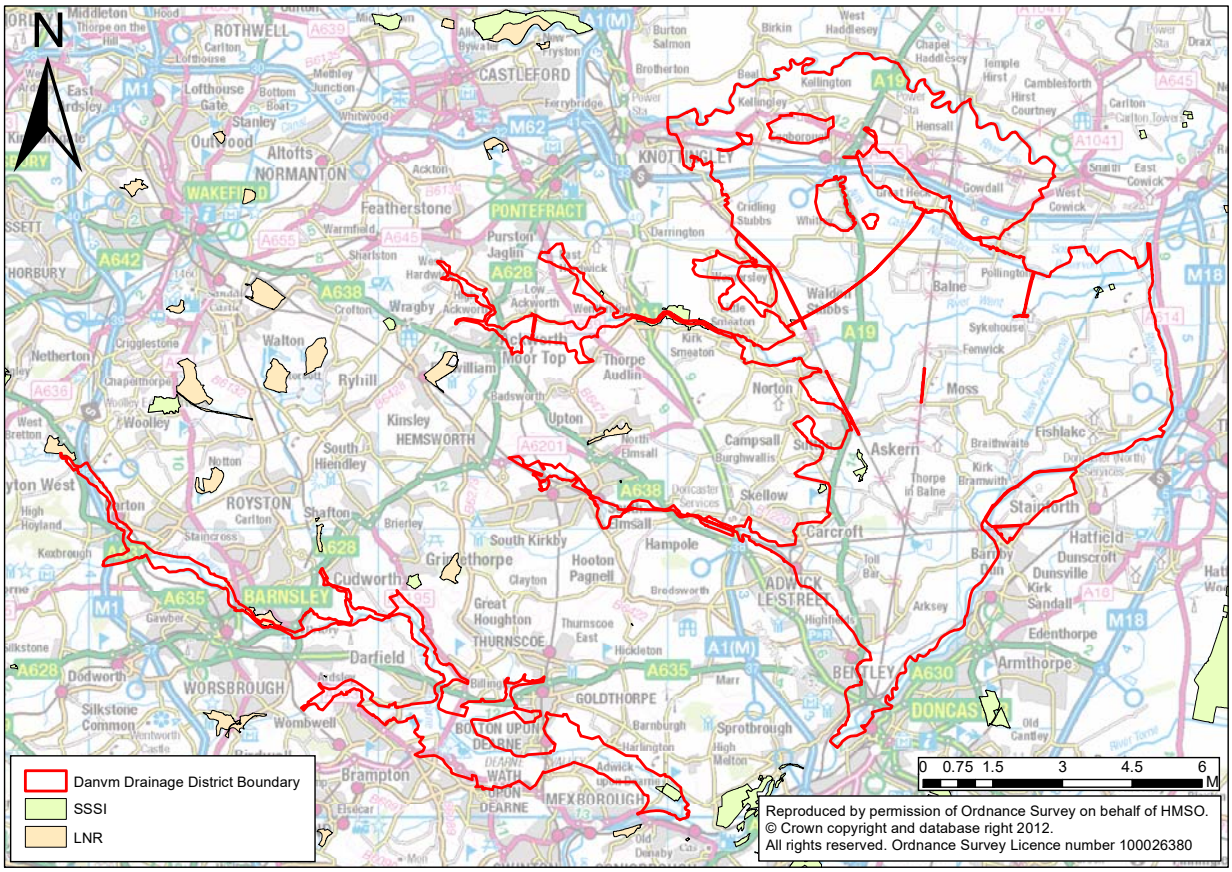


Figure 4-1: Statutory designated nature conservation sites within and adjacent to the Danvm drainage district

In addition to the statutorily designated sites, the Danvm district also contains 126 non-statutory designated sites, which are identified as being locally important for wildlife.

The locations of all non-statutory sites present within the district are displayed below in Figure 4-2, details of the sites and their individual designations is provided in Appendix B.

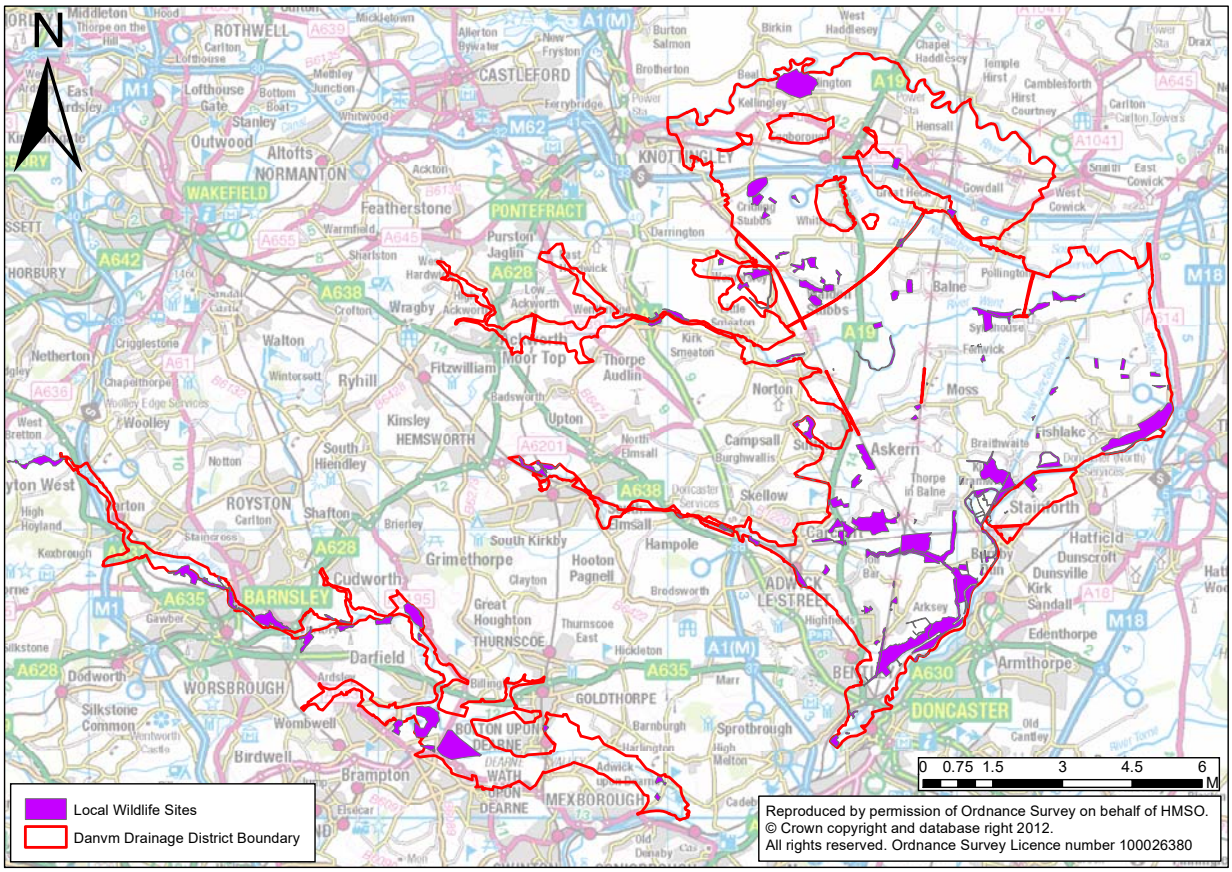


Figure 4-2: Location of non-statutory designated sites within the Danvm drainage district

Many of the statutory and non-designated nature conservation sites within the drainage district are dependent on specific hydrological regimes and support water-dependent habitats and species. Water level management therefore has the potential to adversely impact upon water levels and hydrological regimes of these sites; however, some sites may be enhanced by the management.

Watercourse corridors can also be locations where non-native, invasive species are prevalent, particularly Japanese Knotweed, Giant Hogweed *Heracleum mantegazzianum* and Himalayan Balsam. Raised water levels or maintenance/capital works have the potential to cause the spread of these species through the movement of seeds and plant fragments, however, it may also provide opportunity for their control/eradication.

Key environmental issues

A number of designated nature conservation sites within the Danvm drainage district are largely dependent upon hydrological conditions and are therefore vulnerable to a change in water level. Some protected species and notable habitats present within the district may potentially be negatively impacted upon by the WLMS. The WLMS also provides opportunities for habitat enhancement/creation.

4.4 Water environment

4.4.1 Watercourses

The DDC maintain approximately 416km of watercourse within the district. Up to 40% of the drainage district relies upon mechanical means of lifting water from the watercourses within the low lying areas of land into the River Aire, River Went, River Don, Ea Beck, River Dearne, River Dove and the Aire & Calder Navigation Canal, with gravity discharge dependant on Main River catchment rainfall, topographic levels, and/or tidal influences.

Within the district there are a number of pumping stations which lift water from subsided ground, inherited from the National Coal Board coal mining operations, whose impact on drainage is now managed by the Coal Authority. Coal mining and land drainage have a long standing tradition

and relationship dating back to 1913, which continues presently with private mining companies, licensed by the Coal Authority.

The locations of watercourses managed by the Danvm Drainage Commissioners and Environment Agency Main Rivers, as well as pumping stations situated within the district are shown in Figure 4-3.

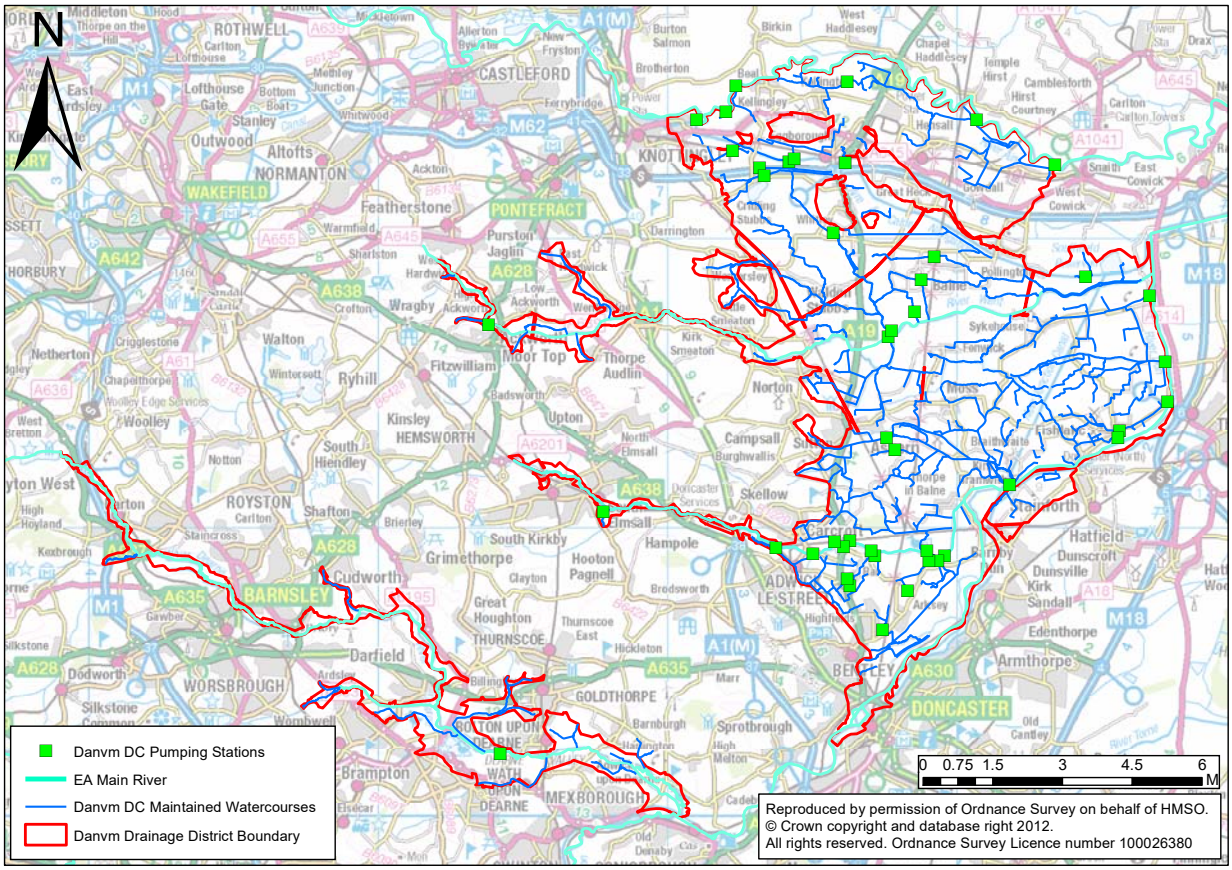


Figure 4-3: Location of EA Main Rivers, DDC maintained watercourses and pumping stations within the Danvm drainage district

4.4.2 Water Framework Directive

The Water Framework Directive (WFD) is a European Directive which requires the introduction of strategic planning measures to manage, protect and improve the water environment and came into force in December 2000. The WFD was transposed into UK legislation in 2003 which resulted in the Environment Agency being made responsible for the production of River Basin Management Plans (RBMPs). The Danvm drainage district is situated within the Humber RBMP. This document identifies the current quality of water bodies in the district and sets objectives for making further improvements to their ecological and chemical quality.

Within the Danvm drainage district there are a number of waterbodies which have been classified under the WFD and are detailed within the Humber RBMP. Some of these waterbodies are divided into a number of sections due to changes in their biological, chemical and hydrological characteristics throughout their length.

The WFD waterbodies located within the district are listed below and details of biological, chemical and hydrological characteristics for each are detailed further in Appendix C.

- River Aire
    - Aire; from River Calder to River Ouse
- River Don
    - Don; from River Dearne to Mill Dyke
    - Don; from Mill Dyke to River Ouse
    - Bramwith Drain from Source to River Don

- River Went
    - Went; from Source to Hoyle Mill Stream
    - Went; from Hoyle Mill Stream to Blowell Drain
    - Went; from Blowell Drain to the River Don
    - Blowell Drain from Source to Womersley Beck
    - Blowell Drain from Womersley Beck to the Went
    - Womersley Beck from Source to Blowell Drain
    - Hoyle Mill Stream; from Source to River Went
- Aire and Calder Navigation
    - New Fleet Drain from Source to River Went
- New Junction Canal
    - Sheffield & South Yorkshire Navigation (New Junction and Stainforth & Keadby Canals)
    - Sheffield & South Yorkshire Navigation (River Don section 4)
- Ea Beck
    - Ea Beck; from Source to Frickley Beck
    - Ea Beck; from Frickley Beck to the Skell
    - Ea Beck; from the Skell to Goosepool Drain
    - Ea Beck; from Goosepool Drain to Abbess Dyke
    - Ea Beck; from Abbess Dyke to River Don
    - Skellow to Askern Area
- Bentley Mill Stream
    - Bentley Mill Stream Upper
    - Bentley Mill Stream Lower to River Don
- The Skell
    - The Skell; from Source to Ea Beck
- River Dove
    - Dove; from Source to River Dearne
- River Dearne
    - Dearne; from Bentley Brook to Cawthorne Dyke
    - Dearne; from Cawthorne Dyke to Lundwood Sewage Treatment Works (STW)
    - Dearne; from Lundwood to River Dove
    - Dearne; Darfield STW to River Don
    - Ings/Carr/Thurnscoe Dikes from Source to Dearne
    - Knoll Beck from Source to River Dearne
    - Cudworth Dike from Source to River Dearne
    - Cawthorne Dyke; from Silkstone Beck to River Dearne

The majority of these waterbodies are designated as artificial or heavily modified water bodies (AWB/HMWB). These are water bodies that have been altered through human activity (for example by flood risk management, urbanisation, land drainage and navigation). AWB/HMWBs have a target to achieve Good Ecological Potential (GEP), which recognises their important uses, whilst making sure ecology is protected as far as possible.

Specific mitigation measures/environmental improvements have been identified by the EA for each AWB/HMWB and are listed in the RBMP. These mitigation measures/environmental improvements are necessary to reduce the existing ecological and hydromorphological impacts on the waterbody and all measures need to be in place in order for the waterbody to achieve GEP.

4.4.3 Surface Water Quality

Surface water quality within the drainage district is most at risk from surface run-off of nitrates from agricultural land as the majority of watercourses within the district intersect, or are adjacent

to, arable fields. Additionally, run-off from urban areas, including domestic and industrial discharge, and a number of point sources of pollution, including sewage treatment works, are likely to put pressure on surface water quality within the district.

4.4.4 Groundwater quality

Groundwater is important for public water supply within the district. Impacts on groundwater are broadly related to land use, with agricultural areas representing a major source of nitrates.

Significant portions of the Danvm drainage district lie within a Source Protection Zone (SPZ), which highlights the importance of the groundwater resources in the area. The district is served by three groundwater sources:

- Don and Rother Millstone Grit and Coal Measures
- Aire and Don Magnesian Limestone
- Aire and Don Sherwood Sandstone

Due to the huge demand placed upon groundwater bodies for abstraction and public use in homes, industry and agriculture, the undertaking of Water Framework Directive assessments of groundwater bodies are undertaken differently to those for surface waterbodies. Instead of assessing the ecological and hydromorphological quality elements of the watercourse, groundwater bodies are assessed based on the quantity of water they contain and its chemical composition. All three groundwater bodies hold 'Good' quantities of water, which is of Poor chemical status.

Key environmental issues

The WLMS must not propose any actions that would cause the deterioration in ecological status of a waterbody, as this may lead to a waterbody failing to meet its WFD objectives. The WLMS provides an opportunity to implement mitigation measures/environmental improvements that have been identified as necessary to reduce the existing ecological and hydromorphological impacts on waterbodies within the drainage district to contribute towards achievement of GEP.

4.5 Geology and soils

Sherwood Sandstone, which underlies the central areas of the district, is the dominant geological group. Further west lies the Zechstien Group which is predominantly comprised of Magnesian Limestones, interbedded with Marls as well as the Upper Pennine Coal Measures.

To the east of the district, the underlying geology of the district is predominantly comprised of peat, which is intersected by veins of alluvium and glacial sand, and gravel associated with the River Don. (BGS, 2013).

The Danvm drainage district is characterised by several soil types, ranging from Light (Silty) to Heavy soils. The soil textures also vary across the district from Loam to Clay, Loam to Silt, Clayey Loam to Sandy Loam and Clay to Clayey Loam (Natural Environment Research Council, 2013).

Key environmental issues

The WLMS is not likely to impact on geology or soils and if any impacts arise they are unlikely to be significant.

4.6 Historic environment

The following cultural heritage assets are located within the Danvm drainage district:

- 22 Scheduled Monuments, including a number of moated sites, a Roman Fort adjacent to Old Hee Pumping Station and earthworks at Sutton Common. Scheduled Monuments are protected under the Ancient Monuments and Archaeological Areas Act 1979. Consent form English Heritage is required for any works that affect Scheduled Monuments.
- 121 listed buildings, 5 of which are listed as Grade II* which are noted as being particularly important buildings of more than special interest. The remainder are listed as Grade II which are nationally important and of special interest. The listed buildings include farmhouses, mills, churches and a number of bridges.

- Bretton Hall Historic Park and Garden which is listed on the English Heritage Register of Parks and Gardens of Special Historic Interest. A very small area of the park lies within the west of the drainage district, adjacent to the River Dearne.

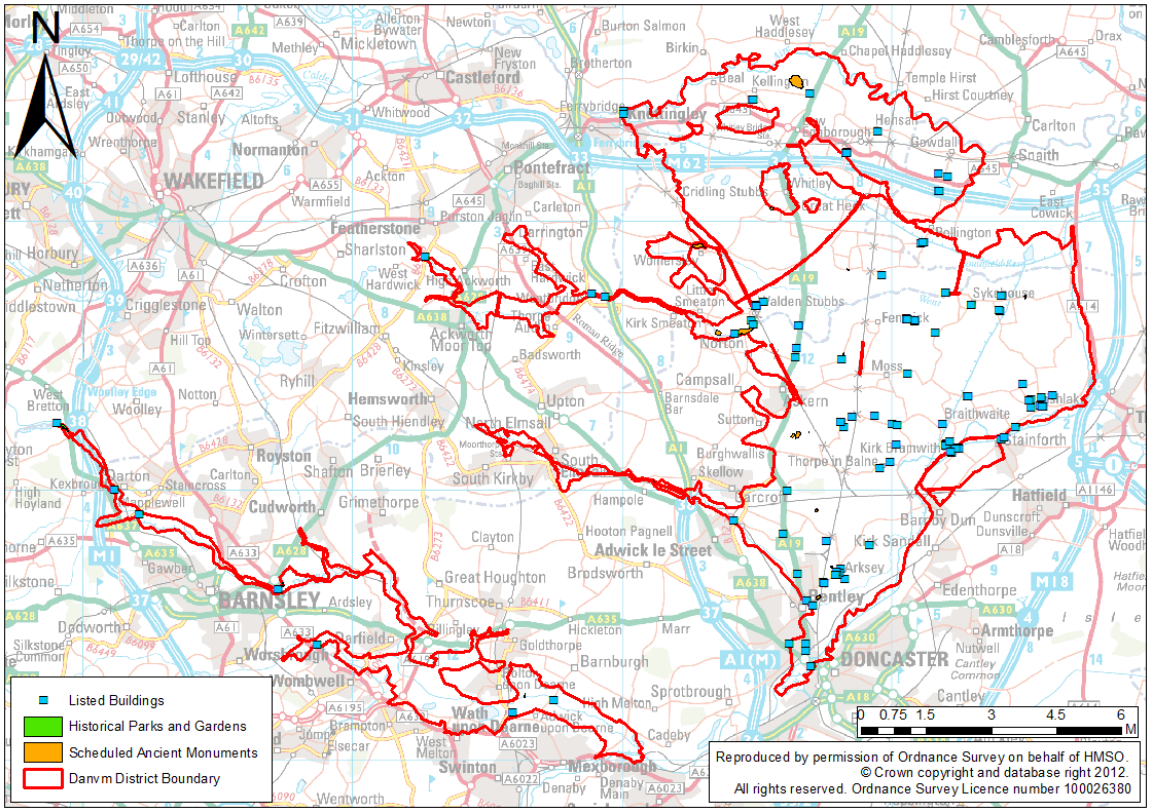


Figure 4-4: Locations of historical and cultural heritage features within the Danvm drainage district

Key environmental issues

The Danvm drainage district contains many historically and culturally valuable sites. Water level management may put some of these features at risk, through construction/maintenance works and any changes to water levels. Measures to protect the integrity of these cultural assets will need implementing if significant impacts are likely.

4.7 Population

The Danvm drainage district falls within six local authority areas; Barnsley Metropolitan Borough Council, Doncaster Metropolitan Borough Council, East Riding of Yorkshire Council, Rotherham Metropolitan Borough Council, Selby District Council and Wakefield Council (as shown on Figure 1-1). The approximate population of each of these local authorities is given in Table 4-4 below, although it should be noted that only part of these districts fall within the Danvm drainage district.

Table 4-4: Population size of local authority areas within the Danvm drainage district

Local Authority	Population
Barnsley Metropolitan Borough Council	231,221
Doncaster Metropolitan Borough Council	302,400
East Riding of Yorkshire Council	334,179
Rotherham Metropolitan Borough Council	257,280
Selby District Council	83,449
Wakefield Council	325,837

4.7.1 Health

Across the six local authority districts that fall within the Danvm drainage district the general health of the inhabitants is comparable, although slightly lower, to that of England as a whole; 77.8% of the population, on average, are in Very Good or Good Health compared to only 7.0% that are in Bad or Very Bad health (England 79.9% and 6% respectively). The life expectancy for women is higher than that for men in all districts with an average of 77.4 years for men and 81.5 years for women (Office for National Statistics, 2011), which is lower than the average for the UK

with men living to 79 years of age and women living to 82.8 years of age (Office for National Statistics, 2013). The age distribution of the population within the six local authorities is shown in Figure 4-5.

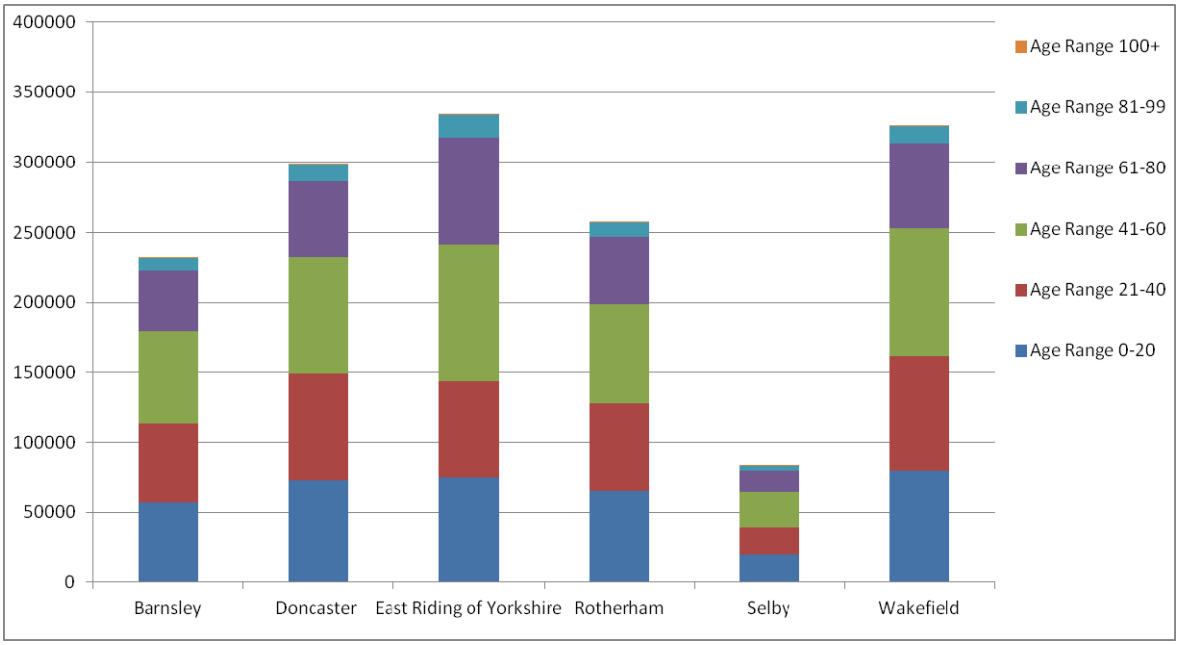


Figure 4-5: Age distribution of people within the six local authorities which fall within the Danvm drainage district. (Data taken from Office for National Statistics, 2011)

4.7.2 Deprivation

The Index of Multiple Deprivation (IMD) provides a measure of relative deprivation across England and was most recently published in 2010. According to the Office for National Statistics (ONS) Indices of Deprivation (2010) the average IMD score for Doncaster Metropolitan Borough Council is higher than the other districts, with Selby District Council scoring the lowest IMD score (Table 4-5). The deprivation scores take into account income, employment, health and education deprivation, among other key indicators of deprivation (Department for Communities and Local Government, 2011). Furthermore, statistics from 2010, show that the percentage of the population of a working age that claim a key benefit range from 22% (Barnsley Metropolitan Borough Council) to 11% (Selby District Council) (Office for National Statistics, 2011).

Table 4-5: Index of Multiple Deprivation

Local Authority	IMD Score
Barnsley Metropolitan Borough Council	28.55
Doncaster Metropolitan Borough Council	29.76
East Riding of Yorkshire Council	14.97
Rotherham Metropolitan Borough Council	28.12
Selby District Council	12.93
Wakefield Council	25.87

Key environmental issues

The operation of pumping stations and the maintenance of watercourses are crucial to protecting people and property from flooding within the drainage district. The WLMS should ensure that the level of protection is not reduced in areas where it would be detrimental to people and property.

4.8 Material assets

4.8.1 Transport Infrastructure

Within the Danvm drainage district there are large lengths of infrastructure present including the M62, A1, A19 and A633. The M18 is also located close to the eastern boundary of the district, and the M1 lies close to the western boundary.

There are several railway lines located within the drainage district, including the East Coast Main Line, Transpennine Route, as well as the Cross Country Mainline. Furthermore, a number of freight railway lines run through the district, some associated with the historical collieries situated nearby, and the ports of the East Coast.

The Aire and Calder Navigation Canal and the New Junction Canal are also located within the drainage district.

4.8.2 Green infrastructure

Equally important as the infrastructure discussed above is the strategic network of green spaces within the district. Green Infrastructure can provide many social, economic and environmental benefits and several Green Infrastructure Corridors are identified within the district. Those located within or adjacent to the Danvm drainage district are listed below in Table 4-6.

Table 4-6: Green infrastructure corridors within the Danvm drainage district (Natural England, 2010)

Green Infrastructure Corridor	
Doncaster	**East Riding**
Rivers Don and Dearne	River Went
River Went	River Don
North Magnesian Limestone	River Aire
Askern-Norton Link	**Wakefield**
Ea Beck and Skelbrook	Limestone Ridge
New Junction Canal Corridor	Went
Barnsley	**Rotherham**
River Dearne Valley	Dearne
River Dove Valley	
Dearne Valley Green Heart	

Key environmental issues

The Danvm drainage district contains important rail and road links. Growing population and development are likely to put pressure on these assets and changes in water levels may impact on their function

The WLMS may provide opportunities to enhance and/or maintain green infrastructure corridors in the district which will have benefits for the population, in terms of health, social and economic benefits, and for the environment, in terms of enhancing habitats and promoting biodiversity.

4.9 Air quality

The Environment Act 2005 requires Local Authorities in England and Wales to monitor and record the levels of certain air pollutants within their area. If levels of air pollutants are recorded to be in excess of the air quality objectives a detailed assessment will be required.

The progress report for Air Quality, as commissioned by Doncaster Metropolitan Borough Council states that the general air quality within the borough is good. It does, however, state that several of the diffusion tubes deployed across the borough returned nitrogen dioxide readings that exceeded the borough's air quality objectives. Six Air Quality Management Areas (AQMA) have been identified all of which are for nitrogen dioxide pollution as a result of road transport emissions (Care4Air, 2013; Doncaster MBC, 2013). Similarly, Barnsley Metropolitan Borough Council has seven AQMAs identified for nitrogen dioxide, a direct result of traffic emissions; all AQMAs are located on roads that sustain heavy traffic flow (Care4Air, 2013).

Rotherham Metropolitan Borough Council has, in the past eleven years declared seven Air Quality Management Areas within the district. Two of these, however, have been revoked as a result of air quality improvement. The AQMAs in the district are predominantly a result of traffic emissions with some arising from industry discharge (Care4Air, 2013).

Selby District Council will proceed to a detailed assessment for annual mean nitrogen dioxide on New Street, Selby. The levels of nitrogen dioxide exceeded the annual mean nitrogen dioxide objectives at this location, resulting from property emissions. No other areas of concern were highlighted within the district. (Selby District Council, 2013).

The 2012 Air Quality Updating and Screening Assessment for East Riding of Yorkshire Council highlighted that two diffusion tube monitoring locations reported nitrogen dioxide levels in excess of the target levels set by the Government. However, no AQMAs are identified for the district at this time. The Annual Progress Report (2013), yet to be made available, will indicate whether these areas of increased emissions require a detailed assessment (Hill, 2012).

Of the six Local Authorities that fall within the Danvm drainage district boundary, Wakefield Council has identified the most AQMAs which are likely to fail to meet the Government's targets. Nine AQMAs have been identified in the district, predominantly associated with major transport links (M62, M1 and A1) and Wakefield city centre itself (Wakefield Council, 2013).

Key environmental issues

Generally, air quality in the Danvm drainage district meets the targets set by the UK Government in the Air Quality Objective (AQO). In addition, the majority of AQMAs identified as a result of monitoring by the Local Authorities fall outside the Danvm drainage district boundary. However, greater pressures on air quality may occur in the future through increases in the population of the district, greater development and increased traffic congestion. This could lead to the designation of additional AQMAs to address local impacts on air quality. However, the WLMS is not likely to impact on air quality and if any impacts arise they are unlikely to be significant.

4.10 Climatic Factors

4.10.1 Current Climate

The Danvm drainage district is located within the North East England climatic regions as classified by the Met Office.

The mean annual temperature range for the region is between 8.5ºC and 9.5ºC, and therefore falls within the UK average mean temperatures of between 7ºC and 11ºC. Typically, January is recorded as the regions coldest month and mean temperatures average at between -0.5ºC and 1.5ºC. The months of July and August average at approximately 21ºC. Average rainfall throughout the year remains at between 43mm and 47mm, occasionally reaching highs of 58mm in the month of December and lows of 37mm in February (Met Office, 2013).

4.10.2 Climate Change

The UK Climate Projection (UKCP09) provides probability-based projections of key climate variables, such as temperature and rainfall at a higher geographic resolution than has previously been available. Projections are based on the Intergovernmental Panel on Climate Change's (IPCC) 'business as usual' emissions scenario.

Current projections indicate significant changes in rainfall, rainfall frequency and intensity and temperatures. In the Yorkshire and Humber region, it is expected that the mean annual temperature will increase by 2ºC, from a current average of 9ºC to approximately 11ºC. In the summer, it is expected that temperatures will, again, rise from their current average of 27ºC to 29ºC.

On the whole, average annual rainfall is predicted to decrease from 838mm to 834mm. However, summer rainfall levels are predicted to decrease and average winter rainfall is expected to increase by 24mm from 219mm to 243mm.

Key environmental issues

With precipitation frequency set to significantly increase in winter, the likelihood of river flooding and overwhelming of drains and sewers will rise due to increased surface runoff. This in turn will lead to localised flood events and increased erosion, which will have implications on human health, infrastructure and designated sites. To accommodate the increased likelihood of such events the WLMS must implement measures aimed at coping with them.

With regard to the natural environment, changing climate, mainly that of changing temperatures poses the biggest threat. Species and habitat abundance and richness will become threatened as a result of changing habitats, localised drier soils and increased competition from non-native invasive species.

4.11 Scoping conclusion

Following a review of this environmental baseline data it has been possible to scope out air quality as an SEA issue as it is unlikely that there will be a significant impact on air quality in the drainage district from the implementation of the WLMS. A summary of the scoping conclusions is given in Table 4-7.

Table 4-7: SEA scoping assessment summary

Receptor	Scoped In	Scoped Out	Conclusion
Landscape and visual amenity	**Yes**	No	Local landscape qualities and integrity of the district could be affected by changes to land drainage as part of the WLMS. Furthermore, impact on locally important urban and rural landscapes and landscape features may occur.
Biodiversity, flora and fauna	**Yes**	No	Changes to water level management could potentially have impacts on protected species and habitats within the Danvm drainage district. There is the potential for both positive and negative impacts as a result of the WLMS. The impacts on protected species and sites must be taken into account in the WLMS.
Water environment	**Yes**	No	Water level management has the potential to impact on water availability, the water quality of the watercourses within the district and WFD objectives. There is the potential for indirect impacts on water dependent designated sites/species. Impact on water resources and quality must be considered in developing the strategy.
Soils and geology	No	**Yes**	The WLMS is not likely to significantly impact upon soils or geology due to the localised nature of any potential impacts.
Historic environment	**Yes**	No	Changes in water levels have the potential to threaten sites and monuments of archaeological and historical importance, including listed buildings and scheduled monuments. Some archaeological features require the maintenance of waterlogged conditions.
Population	**Yes**	No	The WLMS has the potential to provide benefits to the population of the district. However, critical social infrastructure may be negatively impacted by the WLMS as a result of changing land drainage regimes.
Material assets	**Yes**	No	The drainage networks of the rail and road infrastructure often connect into that of the DDC and changes in water levels could impact upon these assets.
Air quality	No	**Yes**	The WLMS is not likely to have a significant effect on air quality in the district due to the localised nature of any potential impacts.
Climate	**Yes**	No	Climate change poses risks to the human population, habitats and species. Furthermore, it puts pressure on designated sites which support a diverse flora and fauna assemblage and are susceptible to changing conditions. The WLMS may offer an environmental benefit as a result of increased energy efficiency, however, the increased risk of climate change may have implications for future land drainage and will need considering in the WLMS.

5 SEA Framework

5.1 Introduction

The SEA framework is used to identify and evaluate the potential environmental issues associated with the implementation of the WLMS. The framework comprises a set of SEA objectives that have been developed to reflect the key environmental issues identified through the baseline information review. These objectives are supported by a series of indicators, which are used as a means to measure the potential significance of the environmental issues and can also be used to monitor implementation of the WLMS.

5.2 SEA objectives and indicators

SEA objectives and indicators have been compiled for each of the environmental receptors (or groups of environmental receptors) scoped into the study during this phase of the project (see Table 4-7). The draft SEA objectives for the WLMS are given in Table 5-1 below.

Table 5-1: SEA objectives and indicators

Receptor	Objective		Indicator
Landscape	1	Protect the integrity of the districts urban and rural landscapes.	Changes in the condition and extent of existing characteristic elements of the landscape. The condition and quality of new characteristics introduced to the environment.
Biodiversity, flora and fauna	2	Protect and enhance protected, important and notable nature conservation sites, habitats and species in the drainage district.	Area of designated nature conservation sites affected water level changes, and an assessment of the impact. Monitoring of reported conservation status of designated nature conservation sites. No net loss of land designated as nature conservation sites as a result of the WLMS. Area of habitat created as a result of implementation of the WLMS.
	3	Maintain and enhance habitat connectivity and wildlife corridors within the district.	
Water environment	4	Do not inhibit achievement of the WFD objectives and contribute to their achievement where possible.	Assessment of WLMS options and impact on the WFD objectives. (e.g. disconnection/ reconnection with floodplain, in-channel works/dredging, barriers to fish movement, reinstatement/removal of natural morphology).
Historic environment	5	Preserve and where possible enhance important historic and cultural sites in the District.	Number of historic sites at risk or impacted from flood events.
Population	6	Minimise the risk of flooding to communities.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc) at risk from flooding.
Material assets	7	Minimise the impacts of flooding to the District's transport network and key critical infrastructure.	Length of road and rail infrastructure at risk from flooding. Number of key infrastructure assets at risk from flooding.
Climate	8	Reduce vulnerability to climate change impacts and promote measures to enable adaptation to climate change impacts.	Number of residential properties at risk of flooding. Number of key services (e.g. hospitals, health centres, residential/care homes, schools etc) at risk from flooding. Area of habitat created as a result of implementation of the WLMS (e.g. flood storage areas creating wetland habitat).

5.3 Impact significance

The unmitigated impacts of the WLMS options on achieving the SEA objectives will be identified through the analysis of the baseline environmental conditions and use of professional judgement. The significance of effects will be scored using the five point scale summarised in

Table 5-2. If there is high uncertainty regarding the likelihood and potential significance of an impact (either positive or negative), it will be scored as uncertain.

Table 5-2: Impact significance key

Impact significance	Impact symbol
Significant positive impact	++
Minor positive impact	+
Neutral impact	O
Minor negative impact	-
Significant negative impact	--
Uncertain impact	?

5.4 SEA assessment approach

5.4.1 Developing Alternatives

The SEA Directive requires an assessment of a plan, strategy or project and its 'reasonable alternatives'. In order to assess reasonable alternatives, different WLMS options will be developed and assessed at a strategic level against the above SEA objectives and environmental baseline as detailed in Section 4. The results of this assessment will be used to inform the decision-making process in choosing preferred WLMS options.

The SEA will also consider a 'do nothing' scenario (i.e. how the situation would develop in relation to each environmental receptor without implementation of the WLMS).

5.4.2 Assessment Approach

The WLMS options will be evaluated in light of their potential cumulative, synergistic and indirect environmental effects on the different SEA receptors selected for further assessment (see Table 4-7). The assessment of these environmental effects will be informed by the baseline data collected at this scoping stage, professional judgement and experience, as well as an assessment of national, regional and local trends. In some cases, the assessment will draw upon mapping data and GIS to identify areas of potential pressure, for example due to presence of environmental designations.

Throughout the assessment the following will apply:

- Positive, neutral and negative impacts will be assessed, with uncertain impacts highlighted.
- The duration of the impact will be considered over the short, medium and long term.
- The reversibility and permanence of the impact will be assessed (e.g. temporary impacts, impacts which can be mitigated against/restored over time or completely irreversible changes to the environment).
- In-combination effects will also be considered.

The significance of effects upon each of the SEA objectives will then be evaluated and used to inform WLMS option selection.

6 Next Steps in the SEA Process

The SEA will be developed concurrently with the WLMS. A WLMS Options Report will be produced which will include the following elements of the environmental assessment:

- Identification of environmental opportunities and constraints
- Assessment of impacts of options
- Identification of potential mitigation and enhancements
- Identification of further assessment, survey, consenting requirements
- Screening assessment with regards to the Habitats Directive.

Appendices

A Appendix A: Review of policies, plans and programmes

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
International				
EC Birds Directive – Council Directive 2009/147/EEC on the conservation of wild birds	Provides protection for all naturally occurring wild bird species and their habitats, with particular protection of rare species.	Designates Special Protection Areas (SPAs) to protect birds and their habitats. The WLMS options/actions must avoid any significant adverse effect on these sites and supporting features. Requires WLMS to be assessed for potential impact.	None.	Biodiversity, flora and fauna
EC Habitats Directive – Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora	Principle aim is to promote the maintenance of biodiversity by requiring Member States to take measures to restore habitats and species to favourable conservation status. Introduces robust protection for habitats and species of European importance. Enables the creation of Special Areas of Conservation (SACs) in order to establish a coherent ecological network of protected sites. Encourages protection and management of flora and fauna and supporting landscapes through planning and development policies.	Designates SACs to protect and promote biodiversity. The WLMS options/actions must avoid any significant adverse effect on these sites and supporting features. Requires WLMS to be assessed for potential impact.	None.	Biodiversity, flora and fauna
EU Floods Directive – Directive 2007/60/EC on the assessment and management of flood risks	Aims to reduce and manage the risk of flooding and associated impacts on the environment, human health, heritage and economy. Principle requirement is the preparation of flood risk management plans at River Basin District level, together with preliminary flood risk assessments and hazard/risk maps.	The WLMS must ensure that any options/actions do not increase flood risk within the district or surrounding areas.	The need to manage flood risk may restrict the implementation of certain measures within the WLMS.	Water environment
EU Groundwater Directive – Directive	Establishes a regime that sets underground water quality standards and introduces	Water quality is relevant to the WLMS as any potential changes in water level	The need to protect water quality may restrict the	Water environment

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
2006/118/EC on the protection of groundwater against pollution and deterioration	measures to prevent or limit inputs of pollutants into groundwater. Implemented in the UK through the Environmental Permitting Regulations (2010).	management may have impacts on surface water and groundwater quality.	implementation of certain measures within the WLMS.	
EU Water Framework Directive – Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for the Community action in the field of water policy	Establishes framework for protection of inland surface waters, transitional waters, coastal waters and groundwater to prevent pollution, promote sustainable water use, protect the aquatic environment, improve the status of aquatic ecosystems and mitigate the effects of floods and droughts.	Member states must prepare River Basin Management Plans and programme of measures for each River Basin District that sets out a timetable approach to achieving the WFD objectives. Places requirements on all relevant authorities to ensure their actions do not contravene the objectives of the Directive.	May restrict WLMS measures if likely to inhibit achievement of WFD objectives and detailed programme of measures. Water level management measures may be strengthened if they actively contribute to meeting the WFD requirements.	Biodiversity, flora and fauna Water environment
European Landscape Convention (2006)	To encourage local authorities to adopt policies and measures at local, regional, national and international level for protecting, managing and planning landscapes throughout Europe. Furthermore, proposals are made to impose financial and legal measures at national and international levels with the aim of shaping landscape policy.	Member states are encouraged to adopt policy with the regard to the protection of their landscape characteristics. The implementation of the WLMS may result in minor changes to the landscape characteristics of the District.	The need to protect and retain local landscape character may constrain WLMS measures.	Landscape and visual amenity
Nitrates Directive (91/676/EEC)	Aims to protect water quality across Europe by preventing the pollution of watercourses from agricultural sources. Forms and integral part of the water framework directive.	Changes to water level management could impact upon pollution events form agricultural sources.	The need to protect water quality may restrict the implementation of certain measures within the WLMS.	Water Environment
Ambient Air Quality Directive (2008/50/EC)	This piece of legislation aims to merge the majority of existing international air quality legislation, in addition, the following aspects have been added: Limiting objectives for Particulate Matter (PM 2.5). Natural sources of air pollution are now omitted; Deadline extensions for meeting European	Measures within the WLMS may contribute towards more sustainable energy consumption and therefore indirectly contribute to the achievement of these objectives.	None.	Air Quality

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
	Commission (EC) limits for pollutants PM10, NO2 and Benzene.			
The Bonn Convention on the Conservation of Migratory Species of Wild Animals (1983)	This piece of legislation aims to conserve terrestrial, marine and avian migratory species throughout their range. It is enforced in European legislation through the Habitats Directive (92/43/EEC) and Birds Directive (79/409/EEC).	Any measures within the WLMS must not hinder the passage of fish/eels within watercourses. The WLMS may provide opportunities to improve passage throughout the district.	The need to ensure fish/eel passage may constrain the implementation of certain measures within the WLMS.	Biodiversity, flora and fauna, Material Assets (Green Infrastructure)
National				
Air Quality Strategy for England, Scotland, Wales and Northern Ireland (2007)	Policy aims to improve and protect Britain's ambient air quality in the medium-term in order to reduce the risk to human health and the environment from eight primary pollutants without resulting in any significant adverse social or economic impacts.	Measures within the WLMS may contribute towards more sustainable energy consumption and therefore indirectly contribute to the protection of local and national ambient air quality.	None .	Air quality
Ancient Monuments and Archaeological Areas Act (1979)	Law relating to ancient monuments and features/areas of archaeological or historical interest. The Act makes provision for the investigation, preservation and recording of matters of such interest for the regulation of operations or activities which may impact upon these matters.	The WLMS will have to take into account the features of archaeological and heritage interest that are protected by this act that are located within the drainage district.	The need to ensure protection of features/areas of archaeological or historical interest may constrain the implementation of certain measures within the WLMS.	Historic Environment
Biodiversity 2020: A Strategy for England's Wildlife and Ecosystems (2011)	Sets out the Government's strategy for improving biodiversity in England up to 2020.	The WLMS could result in impacts upon habitats and species within the drainage district. The WLMS may also provide opportunities to enhance biodiversity.	The strategy could restrict WLMS measures if they are shown to have a significant adverse impact on local biodiversity.	Biodiversity, flora and fauna Water environment
Building a Low Carbon Economy – the UK's Contribution to Tackling Climate Change (2008)	Puts forward a framework for adapting to climate change and associated threats as well as a case for increased resilience to climate change.	Emphasises the commitment to sustainable development and consideration of the potential impacts of climate change, including increased rainfall.	The WLMS may contribute to the aims of the strategy through the provision of measures to adapt to changes in water levels due to future climate change.	Climate
Cabinet Office, National Strategy Action Plan for Neighbourhood Renewal	Within 20 years of its implementation, this policy aimed to raise the entire population above the poverty line, narrowing the gap	Several neighbourhoods within the Danvm district are significantly deprived; a problem which may worsen	The WLMS must consider the implication of the WLMS for areas of the	Population

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
(2001)	between deprived and prosperous neighbourhoods.	should those communities experience adverse impacts as a result of the WLMS. The implementation of the WLMS must therefore ensure that this is avoided in order to contribute to the achievement of this national strategy.	district that are significantly deprived.	
Climate Change Act (2008)	Establishes a definite target to reduce UK national carbon emissions by 80% by 2050, relative to a 1990 baseline. Requires the government to publish five yearly carbon budgets starting with the period 2008-2012. Sets targets to reduce greenhouse gases, and puts in place funding and mechanisms to reduce and alter activities which contribute to the emission of these gasses.	Emphasises the commitment to sustainable development.	The WLMS will need to consider the carbon implications of its options/actions and should seek to minimise emissions whilst promoting sustainable water level management.	Climate
Conservation of Habitats and Species Regulations (2010)	Updated legislation which combines all prior amendments to the regulations, originally compiled in 2004, and transposes the Habitats Directive into law.	The WLMS is unlikely to impact upon any sites designated under this legislation. However, several species protected under the legislation are present within the district that may be impacted, either adversely or positively.	The WLMS must ensure that habitats and species protected under this legislation are not adversely impacted upon.	Biodiversity, flora and fauna
Contaminated Land (England) Regulations (2006)	Sets out provisions relating to the identification and remediation of contaminated land. The regulations identify contaminated land issues and pathways to pollution of surface, ground, estuarine and coastal water environments.	The WLMS could result in changes to current water level management which could create new pathways to pollution of waters.	The need to protect water quality may restrict the implementation of certain measures within the WLMS.	Water environment Soils
Draft Water Bill (2012)	Emerging national strategy aimed at improved regulation of the water industry, whilst increasing its resilience to natural hazards such as drought and floods. It includes provisions to better manage sustainable water abstraction and encourage the use of SuDS.	Aims to promote better management of water resources and reduce the risks of flooding.	None.	Water environment
England Biodiversity Framework (2008)	The framework encourages a number of conservation aspects including the adoption of an ecosystem approach and embeds climate change adaptation principles in conservation action.	The WLMS could result in impacts upon habitats and species within the drainage district. The WLMS may also provide opportunities to enhance biodiversity.	The strategy could restrict WLMS measures if they are shown to have a significant adverse impact on local biodiversity.	Biodiversity, flora and fauna Water environment
Environment Act (1995)	Created a number of new agencies (including	The WLMS must ensure protection of	The WLMS measures may	Biodiversity, flora

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
	the EA) and set new standards for environmental management. It also required the Secretary of State to prepare a National air quality strategy, and provided for the establishment of air quality management areas required the Secretary of State to prepare a National Waste Strategy.	the natural environment.	be restricted if actions as part of the strategy have significant impacts on the environment.	and fauna Water environment
Flood and Water Management Act (2010)	Designates Lead Local Flood Authorities (LLFAs) who 'must develop, maintain, apply and monitor a strategy for flood risk management in its area'. Applies to ordinary watercourses, surface runoff and groundwater.	The WLMS must be compatible with flood risk management plans and strategies within and adjacent to the district.	The need to manage flood risk may restrict the implementation of certain measures within the WLMS.	Water environment Climate
Flood Risk Regulations (2009)	Implements the requirements of the EU Floods Directive, which aims to manage the risk of flooding and associated socio-economic and environmental impacts. Requires LLFAs to manage flooding from surface runoff.	The WLMS must be compatible with flood risk management plans and strategies within and adjacent to the district.	The need to manage flood risk may restrict the implementation of certain measures within the WLMS.	Water environment Climate
Future Water: the Government's water strategy for England (2008)	High level Government policy which outlines its intentions with regard to water demand, water supply, water quality in the natural environment, surface water drainage, river and coastal flooding and greenhouse gas emissions and the state it should be in by 2030.	The WLMS must be compatible the intentions of the strategy.	None.	Water environment, Soils and geology
Heritage Protection for the 21st Century, White Paper (2007)	Aims to promote the protection of the historic environment through the planning system.	Water level management must take into account the historic environment, particularly those features which could be impacted upon by a change in water levels.	Changes to water level management could result in adverse impacts on certain heritage assets.	Cultural heritage
Land Drainage Act 1991 (as amended)	The act consolidates actions relating to IDBs and functions of such boards and of local authorities in relation to land drainage. Under this Act, the boards may choose to undertake maintenance work on any watercourse within its district for the purpose of cleansing, repairing, maintaining, improving or constructing new works within its district. Under the Act, IDBs also have duties with respect to the natural and historic environment.	Key legislation which provides powers for the IDBs to undertake water level management and land drainage.	None	Biodiversity, flora and fauna Water environment Population

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
Making Space for Nature: A Review of England's Wildlife Sites and Ecological Network, (2010)	This strategy aims to mitigate against the risks associated with UK flooding and coastal erosion to society whilst delivering greatest environmental, social and economic benefit , which work towards meeting the Government's sustainable development objectives.	The WLMS provides an opportunity to deliver ecological benefits through changes to current practices.	Changes to water level management could result in adverse impacts on wildlife sites.	Biodiversity, flora and fauna; Water environment; Material assets
Making Space for Water – taking forward a new Government strategy for flood and coastal erosion risk management in England (2005)	Aims to provide strategic direction to deliver sufficient space for water and enable more effective management of coastal erosion and flooding to benefit both people and the economy. The aim being to address these issues to mitigate their impact and to achieve environmental and social benefits.	The WLMS will look at opportunities within pumped catchments to manage water more effectively including the potential for storage.	None	Water environment Population Climate
National Planning Policy Framework (2012)	The National Planning Policy Framework (NPPF) has replaced the set of national planning policy statements and national planning policy guidance notes, bringing them into one document.	The NPPF has replaced PPS25 along with the other PPSs and PPGs, and so comprises the national policy framework in relation to planning in areas of higher flood risk.	None	Biodiversity, flora and fauna Water environment Population Soils
Natural Environment and Rural Communities (NERC) Act (2006)	Provides guidance for the protection and enhancement of important habitat and species.	The WLMS must take into account the requirements of the NERC Act and ensure the protection and enhancement of biodiversity, particularly, those habitats and species of principal biodiversity importance.	Changes to water level management could result in adverse impacts on important habitats and species.	Biodiversity, flora and fauna Water environment
Planning (Listed Buildings and Conservation Areas) Act 1990	The Act places special controls on planning in respect of buildings and areas of special architectural or historic interest.	The WLMS must take into account the presence of listed buildings and other areas of special architectural or historic interest.	May restrict certain WLMS measures if they are shown to be likely to have a significant effect on archaeological or historical assets in the district.	Cultural Heritage
Salmon and Freshwater Fisheries Act (1975)	Aims to regulate practice relating to freshwater fisheries and salmon fishing.	The WLMS must take into account the requirements of the Act with regards to maintaining fish passage throughout the drainage district.	May restrict certain WLMS measures if they could result in the obstruction of fish passage.	Biodiversity, flora and fauna Water environment
The Eels (England and Wales) Regulations 2009	This strategy aims to implement the European Council Regulations 1100/2007 in order to establish measures to aid the recovery	The WLMS must take into account the requirements of the Act with regards to maintaining and providing eel and fish	May restrict certain WLMS measures if they could result in the obstruction of	Biodiversity, flora and fauna

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
	of European eel (*Anguilla anguilla*) stocks which, at present, are outside of safe biological limits.	passage throughout the drainage district.	eel and fish passage.	
UK Biodiversity Action Plan (1994)	The UK BAP aims to maintain and enhance biological diversity within the UK and contribute to the conservation and enhancement of global diversity.	The WLMS will need to consider the potential impacts of measures within it on habitats and species of importance within the District.	The presence of important habitats and species may restrict the implementation of certain WLMS measures.	Biodiversity, flora and fauna Water environment
Wildlife and Countryside Act (as amended) (1981)	The Act is the principle mechanism for legislative protect of wildlife in Great Britain. The Act deals with the protection of birds, other animals and plants.	The WLMS will need to consider potential impacts on SSSIs and protected species within the District.	The presence of SSSIs and protected species may restrict the implementation of certain WLMS measures.	Biodiversity, flora and fauna; Water environment
Regional				
River Basin Management Plan Humber River Basin District (December, 2009)	The Humber RBMP has been prepared to meet the requirements of the EU Water Framework Directive. It focuses on actions to address the protection, improvement, sustainable use of water and other pressures facing the water environment in the Humber River Basin District.	Water quantity and quality is linked to the WLMS. The WLMS has the potential to impact the water bodies within the district and thus may hinder or promote the WFD objectives.	The WLMS may be restricted if significant detrimental impacts on WFD objectives are identified.	Water environment
South Yorkshire Green Infrastructure Strategy (2011)	The strategy presents a vision for South Yorkshire's green infrastructure and provides a framework to support local action and stimulate growth of green infrastructure in the region.	The WLMS must take into account the Green Infrastructure within the drainage district.	The WLMS may be restricted if green infrastructure is likely to be detrimentally impacted. However, the WLMS may provide opportunity to enhance existing green infrastructure assets within the district.	Material Assets
The Historic Environment Strategy for Yorkshire and Humber Region 2009-2013	This Strategy aims to guide and provide a framework to those who manage the region's historic environment and help and decisions makers integrate historic assets and future developments.	The WLMS will need to consider potential impacts on the historic environment.	The presence of important historic assets/features may restrict the implementation of certain WLMS measures.	Historic Environment
The Humberhead Levels (NIA), Nature Improvement Area Programme (2012)	NIAs are areas identified for investment in order to improve the quality of wildlife within them.	The WLMS may provide opportunities to contribute towards ecological improvements within the NIA.	The objectives and actions of the NIA may conflict with the implementation of certain WLMS measures.	Biodiversity, flora and fauna

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
The Yorkshire and Humber Biodiversity Delivery Plan 2010-2015	The Plan outlines how the Yorkshire and Humber Biodiversity Forum (YHBF), aims to take forward the delivery of the Yorkshire and Humber portion of the UK BAP habitat targets.	The WLMS could result in impacts upon habitats and species within the drainage district. The WLMS may also provide opportunities to enhance biodiversity.	The strategy could restrict WLMS measures if they are shown to have a significant adverse impact on local biodiversity.	Biodiversity, flora and fauna Water environment
Local				
Aire Catchment Flood Management Plan Summary Report (2010)	A high-level document that contains long-term policies to guide the management of flood risk within the River Aire catchment now and in the future.	The WLMS must take into account the relevant policies of the CFMP and ensure no adverse impact on flood risk.	None.	Water Environment
Barnsley, Doncaster and Rotherham Joint Waste Plan (2012)	The Plan sets out the overall approach to managing waste across Barnsley, Doncaster and Rotherham over the next 15 years.	The WLMS must take into account any existing or planned waste management facilities within the District that could be impacted upon by water level management activities.	The presence of existing and/or planned waste management facilities may restrict the implementation of certain WLMS measures.	Biodiversity, flora and fauna; Historic Environment; Material Assets; Climate
Catchment Abstraction Management Strategies (CAMS) - Don & Rother, Aire & Calder	The strategies sets out how the Environment Agency will manage water resources in a catchment and provides information on how existing abstraction licences will be managed and water availability for further abstraction.	The WLMS must take into account water abstraction requirements.	The need to provide water for abstractions may restrict the implementation of certain WLMS options.	Water environment
Danvm Drainage Commissioners Biodiversity Action Plan (2012)	The Plan identifies objectives for the conservation and enhancement of biodiversity within the drainage district, and goes on to describe targets and actions to deliver these objectives.	The WLMS could result in impacts upon habitats and species within the drainage district. The WLMS may also provide opportunities to enhance biodiversity.	The strategy could restrict WLMS measures if they are shown to have a significant adverse impact on local biodiversity.	Biodiversity, flora and fauna
Don Catchment Flood Management Plan Summary Report (2010)	A high-level document that contains long-term policies to guide the management of flood risk within the River Don catchment now and in the future.	The WLMS must take into account the relevant policies of the CFMP and ensure no adverse impact on flood risk.	None.	Water Environment
Doncaster Green Infrastructure Strategy 2014-2019 (Draft)	This Draft plan sets out the overall approach by Doncaster Metropolitan Borough Council for delivering a network green spaces, habitats and landscapes across the district.	The WLMS must take into account the Green Infrastructure within the drainage district.	The WLMS may be restricted if green infrastructure is likely to be detrimentally impacted. However, the WLMS may provide opportunity to enhance existing green infrastructure assets within	Biodiversity, flora and fauna Material Assets

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
			the district.	
Doncaster's Environment Strategy (2012)	The strategy will drive plans and policies that protect and enhance Doncaster's environment.	The WLMS must be compatible with the intentions of the strategy.	None.	Biodiversity, flora and fauna; Climate; Air Quality; Water Environment
East Riding of Yorkshire Rural Strategy 2013-2016	The strategy assesses the implications for the rural areas in the district in relation to the economy and in respect of implementing Government policy at the local level. The Strategy highlights 12 objectives which aim to provide economic growth, protect the environment and enhance wellbeing in rural communities.	The WLMS must be compatible with the intentions of the strategy.	None.	Population
Geodiversity Action Plan for Doncaster (2008)	The Plan aims to contribute toward the conservation, restoration, enhancement and management of Doncaster's geological heritage, among other objectives.	The WLMS will need to consider potential impacts on sites of geological importance within the District.	The presence of important geological sites may restrict the implementation of certain WLMS measures.	Soils and Geology
Local Biodiversity Action Plans (Doncaster, Selby, Barnsley, East Riding. Wakefield and Rotherham)	The Plans outline wildlife conservation priorities within the local authorities and identifies actions to help protect and enhance biodiversity.	The WLMS could result in impacts upon habitats and species within the drainage district. The WLMS may also provide opportunities to enhance biodiversity.	The strategy could restrict WLMS measures if they are shown to have a significant adverse impact on local biodiversity.	Biodiversity, flora and fauna
Local Development Framework documents (Doncaster, Selby, Barnsley, East Riding, Wakefield, Rotherham)	Each Local Planning Authority produces a collection of Local Development Framework documents which detail the strategy for development and use of land in an area of authority	Within the Local Development Framework, the development plans set out a spatial vision, strategic objectives and policies for development in the local authorities. The WLMS will have to take planning policy and objectives into account.	The WLMS may require revision if plans conflict with objectives set out in the Local Development Framework documents.	Material Assets
Lower Aire Flood Risk Management Strategy and SEA (2012)	The strategy sets out a plan for local flood risk management in the floodplain of the River Aire. The SEA assesses the potential environmental consequences of the aforementioned strategy.	The strategy proposes the withdrawal of maintenance by the EA of the River Aire embankments within the drainage district. This will need to be considered within the WLMS.	The withdrawal of maintenance of the River Aire embankments may restrict the implementation of certain WLMS measures.	Water Environment; Biodiversity, flora and fauna; Material Assets; Population.
Preliminary Flood Risk Assessments (2011)	Preliminary Flood Risk Assessments have been produced by lead local flood authorities	The WLMS must take into account the findings of the PFRAs and ensure no	None.	Water Environment; Biodiversity, flora

Plan/Policy/Programme	Overview	Relevance to WLMS	Conflict with WLMS	Primary SEA topic
(Doncaster, North Yorkshire, Barnsley, East Riding, Wakefield, Rotherham)	(LLFAs) in England and Wales to fulfil statutory requirements in the Flood Risk Regulations.	adverse impact on flood risk.		and fauna; Material Assets; Population.
Selby Countryside and Green Space Strategy (2013)	The Strategy sets out Selby's management objectives of the countryside and green space throughout the district.	The WLMS must be compatible the intentions of the strategy.	None.	Material Assets
The Dearne Valley Green Heart (NIA), Nature Improvement Area Programme (2012)	NIAs are areas identified for investment in order to improve the quality of wildlife within them.	The WLMS may provide opportunities to contribute towards ecological improvements within the NIA.	The objectives and actions of the NIA may conflict with the implementation of certain WLMS options.	Biodiversity, flora and fauna
Water Level Management Plans (WLMPs) for Shirley Pool SSSI, Went Ings Meadows SSSI and Forlorn Hope Meadows SSSI	WLMPs are required for all areas which have a conservation interest, with priority given to Sites of Special Scientific Interest (SSSIs), where the control of water is important for the designated features. WLMPs are a means of balancing water level management for a range of land uses and activities within an area, including agriculture, angling, flood risk and conservation.	The WLMS must take into account the hydrological requirements of the SSSI within the drainage district.	The presence of SSSI and the requirements of the WLMPs may restrict the implementation of certain WLMS options.	Biodiversity, flora and fauna

B Appendix B: Table of Non-Statutory Sites

Site	Designation	District
Kingsland Wood	SINC	Selby
Gale Common Ash Disposal Site	SINC	Selby
Grant Spring, Womersley	SINC	Selby
Womersley Park	SINC	Selby
Ricketcroft Wood	SINC	Selby
Belt Plantation	SINC	Selby
Steel Spring	SINC	Selby
Clipsall Wood	SINC	Selby
Broadoak Spring	SINC	Selby
Busky Wood	SINC	Selby
Ox Stocking Wood	SINC	Selby
Brown Ings Wood	SINC	Selby
Birdspring Wood	SINC	Selby
Saulcroft Wood	SINC	Selby
Fox Covert	SINC	Selby
Barn Fall Wood	SINC	Selby
Parkshaw Wood	SINC	Selby
Balne Moor Ponds	SINC	Selby
Ditch West of Balne Moor Ponds	SINC	Selby
Great Lawn Rein, Womersley	SINC	Selby
Disused Railway Line	SINC	Selby
Sand Quarry, Great Heck	SINC	Selby
Disused Pit	SINC	Selby
Brockadale, Wentbridge	SINC	Selby
Beal Carrs	SINC	Selby
River Went Floodbank	SINC	Selby
Hexthorpe Ings	SSI	Doncaster
Plant Works Railway Sidings	SSI	Doncaster
Wheatley Park & Old Don Oxbows	SSI	Doncaster
Size Ings	SSI	Doncaster
Randall Croft Wood	SSI	Doncaster
Wellsyke Drain	SSI	Doncaster
Duck Holt Plantation	SSI	Doncaster
Bentley Moor Wood	SSI	Doncaster
Adwick le Street Sewage Works	SSI	Doncaster
Norwood, Tilts Drain and Old Ea Beck	SSI	Doncaster
Shaftholme	SSI	Doncaster
Willow Garth Fish Ponds	SSI	Doncaster
Daw Lane Plantation	SSI	Doncaster
Arksey Round About Moat	SSI	Doncaster
Arksey Pond	SSI	Doncaster
Moat Hill, Bentley	SSI	Doncaster
Bentley Bank	SSI	Doncaster
Pilkington's Burgy Banks	SSI	Doncaster
Arksey Ings	SSI	Doncaster
Bentley Ings	SSI	Doncaster
Bentley Common	SSI	Doncaster
Bentley Railway Embankments and Ponds	SSI	Doncaster
Black Pond	SSI	Doncaster
Old River Don Oxbow	SSI	Doncaster
Mexborough Low Pasture	SSI	Doncaster
Hampole Hall Pasture	SSI	Doncaster
Hampole Dike	SSI	Doncaster
Norton Priory, Mill stream & Fields	SSI	Doncaster
Campsall Country Park	SSI	Doncaster
Bradley's Well	SSI	Doncaster
Owston Park	SSI	Doncaster
Brick Kiln Plantation	SSI	Doncaster
Sixteen Acre Plantation	SSI	Doncaster

Site	Designation	District
Owston Wood	SSI	Doncaster
Thornhurst (Carcroft) Pond	SSI	Doncaster
Shirley Pool and Rushy Moor Area	SSI	Doncaster
Copley Spring Wood	SSI	Doncaster
Moss Brick Pond	SSI	Doncaster
Fenwick Churchyard	SSI	Doncaster
Riddings Farm Pond	SSI	Doncaster
Fenwick Hall Moat	SSI	Doncaster
River Went Oxbow	SSI	Doncaster
Went Valley	SSI	Doncaster
Bentley Tilts & course of Old Ea Beck	SSI	Doncaster
Thorpe Marsh Area	SSI	Doncaster
Joan Croft Pond	SSI	Doncaster
Trumfleet Pit	SSI	Doncaster
Trumfleet Pond	SSI	Doncaster
Wrancarr Drain & Braithwaite Delves	SSI	Doncaster
Broad Ings Oxbow	SSI	Doncaster
Hobledehoy Wood	SSI	Doncaster
Lodge Lane Pond	SSI	Doncaster
West Ings	SSI	Doncaster
Old Ings and Chequer Land	SSI	Doncaster
Ruskholme	SSI	Doncaster
Thorpe in Balne/Kirk Bramwith Area	SSI	Doncaster
Bramwith Lock Woods	SSI	Doncaster
Northfield Pond	SSI	Doncaster
Northfield Lane	SSI	Doncaster
Barnby Dun Old Don Oxbows	SSI	Doncaster
Bramwith Lane Wood	SSI	Doncaster
Croft Ings	SSI	Doncaster
Barnby Dun Borrow Pits	SSI	Doncaster
Old River Don Oxbow	SSI	Doncaster
Fox Covert	SSI	Doncaster
Marsh Lane	SSI	Doncaster
Long Sandall Ings	SSI	Doncaster
Bunfold Shaw	SSI	Doncaster
Went Valley	SSI	Doncaster
Clay Bridge Field	SSI	Doncaster
Westfield Ings	SSI	Doncaster
Little Fen Fields	SSI	Doncaster
Fen Carr	SSI	Doncaster
Geeseness Lane Meadows	SSI	Doncaster
Low Ings	SSI	Doncaster
Steward's Ings Lane Meadow	SSI	Doncaster
Cowick Road Pasture and Pond	SSI	Doncaster
Thorne Watersides, Oxbows and Ings	SSI	Doncaster
Thorne Ashfields	SSI	Doncaster
Bramwith Hall	SSI	Doncaster
Johnny Brown's Common	Nature Areas	Wakefield
Mutton Flatts	Nature Areas	Wakefield
Sunny Bank, Horse Carr & Storrs Wood	LWS	Barnsley
Edderthorpe Ings	LWS	Barnsley
Broomhill Flash and Wombwell Ings	LWS	Barnsley
Gipsy Marsh	LWS	Barnsley
Old Moor & Wath Ings	LWS	Barnsley
Bolton-on-Dearne Wetland	LWS	Barnsley
Bretton Park	LWS	Barnsley
Cliff Wood	LWS	Barnsley
Barnsley Canal at Wilthorpe	LWS	Barnsley
Stairfoot Disused Railway	LWS	Barnsley
Parkshill Nature Reserve	LWS	Barnsley
Old Mill Lane Culvert Bat Roost	LWS	Barnsley

C Appendix C: Summary table of Water Framework Directive Current Status and Objectives for Watercourses within the Danvm Drainage District

C.1 WFD Status and Objectives

Water Body	Designation	Current Overall Status	Current Chemical Status	Objectives
Aire from River Calder to River Ouse	Heavily Modified Flood Protection, Navigation, Urbanisation, Wider Environment	Moderate Potential	Fail (Very Certain)	Good Ecological Potential by 2027 Good Chemical Status by 2027
Don from Mill Dyke to River Ouse	Artificial Land Drainage	Moderate Potential	Good	Good Ecological Potential by 2027 Good Chemical Status by 2015
Don from River Dearne to Mill Dyke	Heavily Modified Flood Defence	Moderate Potential	Fail (Very Certain)	Good Ecological Potential by 2027 Good Chemical Status by 2027
Bramwith Drain from Source to River Don	Artificial Land Drainage	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Went from Source to Hoyle Mill Stream	Not Designated A/HMWB	Poor	Good	Good Ecological Status by 2027 Good Chemical Status by 2015
Went from Hoyle Mill Stream to Blowell Drain	Heavily Modified Flood Protection	Poor Potential	Does not require assessment	Good Ecological Potential by 2027
Went from Blowell Drain to the River Don	Heavily Modified Flood Protection, Urbanisation, Water Storage - non-specific	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Blowell Drain from Source to Womersley Beck	Artificial Land Drainage	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Blowell Drain from Womersley Beck to the Went	Artificial Land Drainage	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Womersley Beck from Source to Blowell Drain	Artificial Land Drainage	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Hoyle Mill Stream from Source to River Went	Heavily Modified Flood Protection	Good	Does not require assessment	Good by 2015
New Fleet Drain from Source to River Went	Artificial Land Drainage	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Sheffield & South Yorkshire Navigation (New Junction and Stainforth & Keadby Canals)	Artificial Navigation	Moderate Potential	Good	Good Ecological Potential by 2027 Good Chemical Status by 2015
Sheffield & South Yorkshire Navigation (River Don section 4)	Artificial Navigation	Good	Does not require assessment	Good by 2015

Water Body	Designation	Current Overall Status	Current Chemical Status	Objectives
Ea Beck from Source to Frickley Beck	Not Designated A/HMWB	Bad	Does not require assessment	Good by 2027
Ea Beck from Frickley Beck to the Skell	Heavily Modified Flood Protection	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Ea Beck from the Skell to Goosepool Drain	Heavily Modified Flood Protection, Urbanisation	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Ea Beck from Gossepool Drain to Abbess Dyke	Heavily Modified Flood Protection	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Ea Beck from Abbess Dyke to River Don	Heavily Modified Flood Protection	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Skellow to Askern Area	Artificial Land Drainage	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Bentley Mill Stream Upper	Heavily Modified Urbanisation	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Bentley Mill Stream Lower to River Don	Heavily Modified Flood Protection, Urbanisation	Moderate Potential	Fail (Very Certain)	Good Ecological Potential by 2027 Good Chemical Status by 2015
The Skell from Source to Ea Beck	Heavily Modified Flood Protection	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Dove from Source to River Dearne	Heavily Modified Flood Protection	Poor	Good	Good Ecological Potential by 2027 Good Chemical Status by 2015
Dearne from Bentley Brook to Cawthorne Dyke	Heavily Modified Urbanisation, Water Storage - non-specific	Moderate Potential	Good	Good Ecological Potential by 2027 Good Chemical Status by 2015
Dearne from Cawthorne Dyke to Lundwood Sewage Treatment Works (STW)	Heavily Modified Flood Protection	Moderate Potential	Good	Good Ecological Potential by 2027 Good Chemical Status by 2015
Dearne from Lundwood to River Dove	Heavily Modified Flood Protection	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Dearne Darfield STW to River Don	Heavily Modified Flood Protection	Moderate Potential	Fail (Quite Certain)	Good Ecological Potential by 2027 Good Chemical Status by 2027
Ings/Carr/Thurnscoe Dikes from Source to Dearne	Not Designated A/HMWB	Poor	Does not require assessment	Good Ecological Status by 2027
Knoll Beck from Source to River Dearne	Heavily Modified Flood Protection, Urbanisation	Moderate Potential	Does not require assessment	Good Ecological Potential by 2027
Cudworth Dyke from Source to River Dearne	Not Designated A/HMWB	Bad	Does not require assessment	Good Ecological Status by 2027
Cawthorne Dyke from Silkstone Beck to River Dearne	Not Designated A/HMWB	Poor	Does not require assessment	Good Ecological Status by 2027

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Coleshill
Doncaster
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Skipton
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Wallingford
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Registered Office
South Barn
Broughton Hall
SKIPTON
North Yorkshire
BD23 3AE

t:+44(0)1756 799919
e:info@jbaconsulting.com

Jeremy Benn Associates Ltd
Registered in England
3246693

Visit our website
www.jbaconsulting.com