



Swale & Ure Drainage Board Tour of Inspection



Friday 08 November 2019

Welcome to the Swale & Ure Drainage Board Tour of Inspection

The theme of the Tour is to give an insight into the work of the Swale & Ure Drainage Board who broadly operates between Catterick in the north and Wetherby in the south following the A1/A19 corridors.

Objectives

- Demonstrate the importance of maintaining the function and capacity of the strategic main water carriers.
- Express the importance of Planning and Development Control.
- Communicate the Board's views on Ecology and the Environment.
- Open Discussion on Invasive Non-Native Species (INNS)

The Tour will take us north from Thirsk passing through the former Wiske area where Spudling Dyke our one and only pumping station is sited on the left of the A167. We will disembark at a development to the north of Northallerton to make our first inspection.

We shall then move on to the west of the A1(M) into the Bedale District and our second inspection will be that of Bedale Beck.

Our third inspection will be at Scurf beck, also within the Bedale District.

Our return to Thirsk will be following the A1 corridor south which passes through our Drainage District.

May we wish you all an informative and enjoyable day.

ITINERARY

09.30	Meet at Gavel Restaurant for tea/coffee/biscuits and Welcome
10.00	Coach Departs
10.35	North Northallerton Development
11.10	Coach Departs
11.30	Bedale Beck
11.55	Coach Departs
12.05	Scurf Beck
12.45	Coach Departs
13.15	Return to Thirsk Auction Mart for pre-lunch refreshments
13.45	Lunch followed by Questions and Answer session
15.00	Close

GUESTS

Mr Peter Bateson	- Chief Executive Officer, Witham Fourth IDB
Mr Robin Bosomworth	- Former Board Member
Mr Robert Caudwell	- Chairman, Association of Drainage Authorities
Mr Joe Clarke	- Landowner
Mr James Copeland	- Environmental & Land Use Advisor, National Farmers Union
Mr David Coxon	- Coxon Brothers, Board Retained Contractors
Mr James Coxon	- Coxon Brothers, Board Retained Contractors
Mrs Karen Daft	- Chief Executive Officer, Welland and Deepings IDB
Mr John Freed	- Environment Agency
Mr Robert Frewen	- Rural Practice Surveyor, CLA
Mr Louis Harvey	- Local Delivery Lead Flood & Coastal Risk, EA
Mr Steven Hills	- Landowner
Ms Bernie Higgins	- Yorkshire Wildlife Trust
Mr Andrew McGill	- Chief Executive Officer, Lindsey Marsh IDB
Ms Emily Mellalieu	- Lead Local Flood Authority, North Yorkshire County Council
Mr Adrian Morrison	- A R Morrison, Retained Board Contractors
Mr Chris Morrison	- A R Morrison, Retained Board Contractors
Ms Laurie Norris	- County Advisor North Riding & Durham, NFU
Mr Trevor Purlant	- Chair, Welland and Deepings IDB
Mr Richard Raper	- Landowner
Mr Stuart Roberts	- Vice President, National Farmers Union
Mr Innes Thomson	- Chief Executive Officer, Association of Drainage Authorities
Mr Dan Turner	- Yorkshire Dales River Trust
Ms Allie Hesketh	- Assistant Environment and Land Use Advisor NFU North East
Baroness Anne McIntosh of Pickering	- Vice President ADA

BOARD MEMBERS

- Mr Mark Sampson - Chair
 - Mr Tim Webster - Vice-Chair
 - Mr David Anderson
 - Mr Graham Clarke
 - Mr Peter Houseman
 - Mr Brian Phillips
 - Mr Donald Sanderson
 - Mr Robert Sanderson
 - Mr Richard Tesseyman
 - Mrs Liz Wilson
 - Mr Richard Ormston
 - Cllr Zoe Metcalfe - Appointed Member, Harrogate Borough Council
 - Cllr Richard Ormston - Appointed Member, Richmondshire District Council
 - Cllr Isobel Sanderson - Appointed Member, Hambleton District Council
- = Present

BOARD OFFICERS

Mr Ian Thornton	- Chief Executive Officer
Mr Roger Smith	- Chief Engineer/Planning & Enforcement Officer
Mr Matthew Cooke	- Asset Manager
Ms Alyson Duffy	- Board Secretary, Knaresborough

What are IDB's

Each Internal Drainage Board (IDB) is a public body that manage water levels in an area, known as an Internal Drainage District, where there is a special need for drainage. IDBs undertake works to reduce flood risk to people and property and manage water levels for agricultural and environmental needs within their District.

Today, there are 112 IDBs in England whose Districts cover 1.2 million hectares (9.7% of England's landmass). They play a key role in reducing flood risk to over 600,000 people and almost 900,000 properties. They operate and maintain over 500 pumping stations, 22,000 km of watercourse, 175 automatic weed screen cleaners and numerous sluices and weirs. (ADA, 2016)



History and Formation

The Swale & Ure Drainage Board was formally created on 01 April 2012 when five Drainage Boards (Bedale & Upper Swale, Cod Beck, Claro, Lower Swale and River Wiske) were amalgamated.

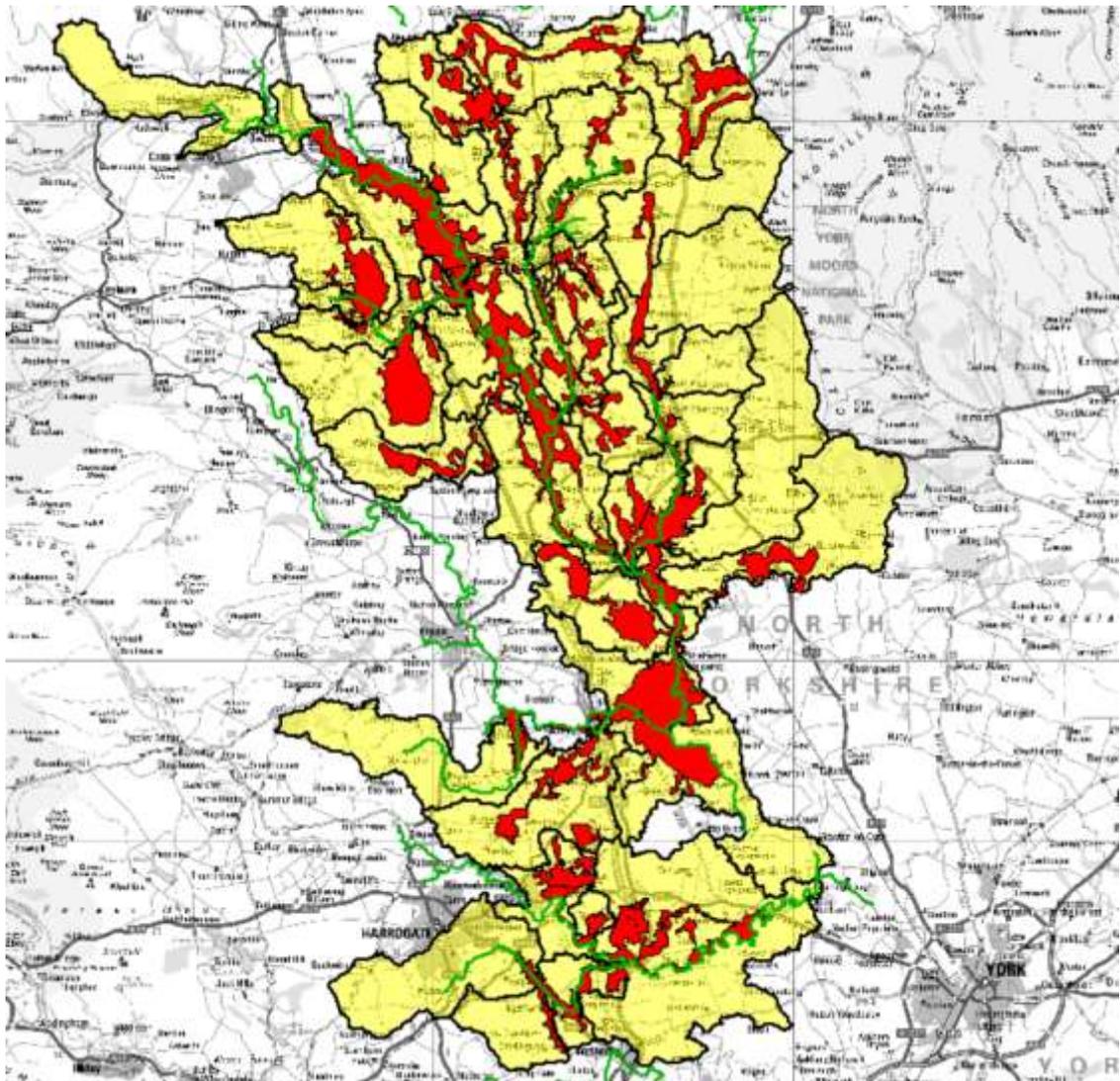
Records exist for the former Boards from around 1933 after the passing of the 1930 Land drainage act (LDA) which required the formalisation of all Boards.

OS maps from 1849 show minimal alteration to the modern-day conveyance system.

Supposition suggests that the pioneering water level engineering was carried out between 1771 (Jefferson Archive maps) and 1821 (multiple archive estate maps), where work on the Great North of England Railway and its branch lines drained agricultural land to the benefit of the railway line foundations.

The Swale & Ure Drainage Board Area

The Swale & Ure Drainage Board District encompasses 203.4km² of low lying urban and agricultural land, which sits within a further catchment of 1001.8 km² of North Yorkshire. The Board District also accommodates water from the Rivers Swale, Ure and Nidd. These rivers convey water from the Yorkshire Dales through to the North Sea.



The map above shows the Swale & Ure Drainage Board District (red) 203.4km², along with its direct feeder catchments (yellow) 1001.8 km².

The Board is predominantly a gravity-controlled Board, having one pumping station, and as with many other Districts the Board are experiencing large development areas around the peripheries of the principal market towns. This, together with the possibility in the south of a new 3,000 housing development, creates a new conurbation, all of which will be within the Swale & Ure Drainage Board District.

The Swale & Ure Drainage Board – An Irregular District

IDBs manage water levels in areas where there is a “special need for drainage”. For most IDBs the special drainage need occurs in broad open areas of lowland such as the Fens, Somerset Levels or Humberhead Levels or within the floodplains of rivers that are often at or below sea level. These IDBs are often mechanically pumped.

The Swale & Ure Drainage Board derives its special drainage need due to operating in the post glacial environment of Northern England where the remnant Boulder Clay Tills, Eskers and Moraines have left an undulating landscape. Without the generations of improvements and maintenance by the Swale & Ure Drainage Board and former Boards the landscape would have been dominated by mires, bogs and stagnant marshland. The landscape has been managed as a whole to benefit all.



The majority of the Swale & Ure Drainage Board strategic main water carriers convey water under the power of gravity with poorly draining basins being interconnected with deep engineered cuts and culverts. The Board’s highest watercourse River Wiske Carr Beck’s bed level is 81.4 Above Ordnance Datum (AOD) discharging to the River Swale 64km downstream at 16.4m AOD.

North Northallerton Development



Hambleton District Council has approved a planning application from a consortium of developers – Persimmon Homes, Mulberry Homes and Taylor Wimpey – for outline approval for 900 homes, employment uses, a neighbourhood shopping centre, extra care facilities, a primary school and community uses - sports pitches and allotments.

The submission also includes an application for full consent for the strategic North Northallerton Link Road and Bridge over the mainline railway, 298 residential homes (150 by Persimmon to the east of Darlington Road and 148 by Taylor Wimpey to the west of Stokesley Road), sustainable urban drainage systems and a village green.

Approximately 80% of the area being developed lies within the Swale & Ure Drainage Board District. Early ground investigations found that the land substrate was made up from a poorly draining clay. This dictated that surface water would be discharged via open watercourses (following the SUDs hierarchy guidelines).

Real World application to the LDA and Byelaws



The map to the left shows part 1a of the North Northallerton Development around Stone Cross Stile (blue). Due to enforcement of the Land Drainage Act the developer has had to:

- Leave an easement strip (9m purple) along the edge of the watercourse for our access
- Obtain consent for 3 bridges (structures) crossing the watercourse that satisfy the IDB on capacity and blockages
- Obtain consent for 3 outfalls ensuring that we are satisfied that they will not be causing opposite bank erosion
- Obtain consent ensuring all structures within 9m will withstand the weight of an excavator
- Obtain consent regarding surface water discharge that ensures that the whole development does not discharge water > 1.4l/s/ha

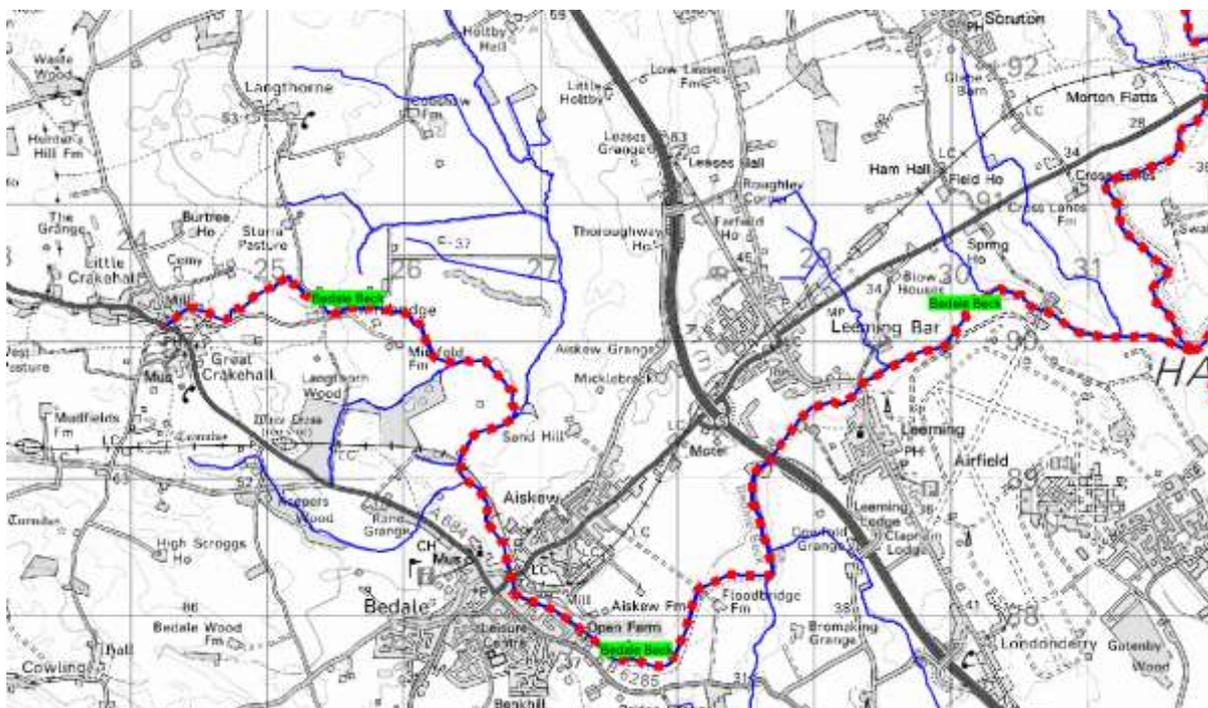
EA BEDALE BECK

EA Bedale Beck is a 'low consequence' Main River that can be used as a cornerstone of understanding for some of the challenges facing the Drainage Board.

The issues covered today include:

- geographic context of the catchment.
- importance of function of Bedale Beck to the Drainage Board.
- the current status of the national EA De-Maintenance project.
- Encroachment by Invasive Non-Native Species (INNS).

Bedale Beck is a watercourse running from Crakehall to the confluence of the River Swale and is approximately 12km in length. The watercourse serves agricultural land in addition to running through the urban areas of Bedale and Crakehall. It also serves three main Drainage Board sub-catchments: Snape Mires, Rand Beck and the Scurf, minor Drainage Board watercourses along its length and takes water from above Crakehall.



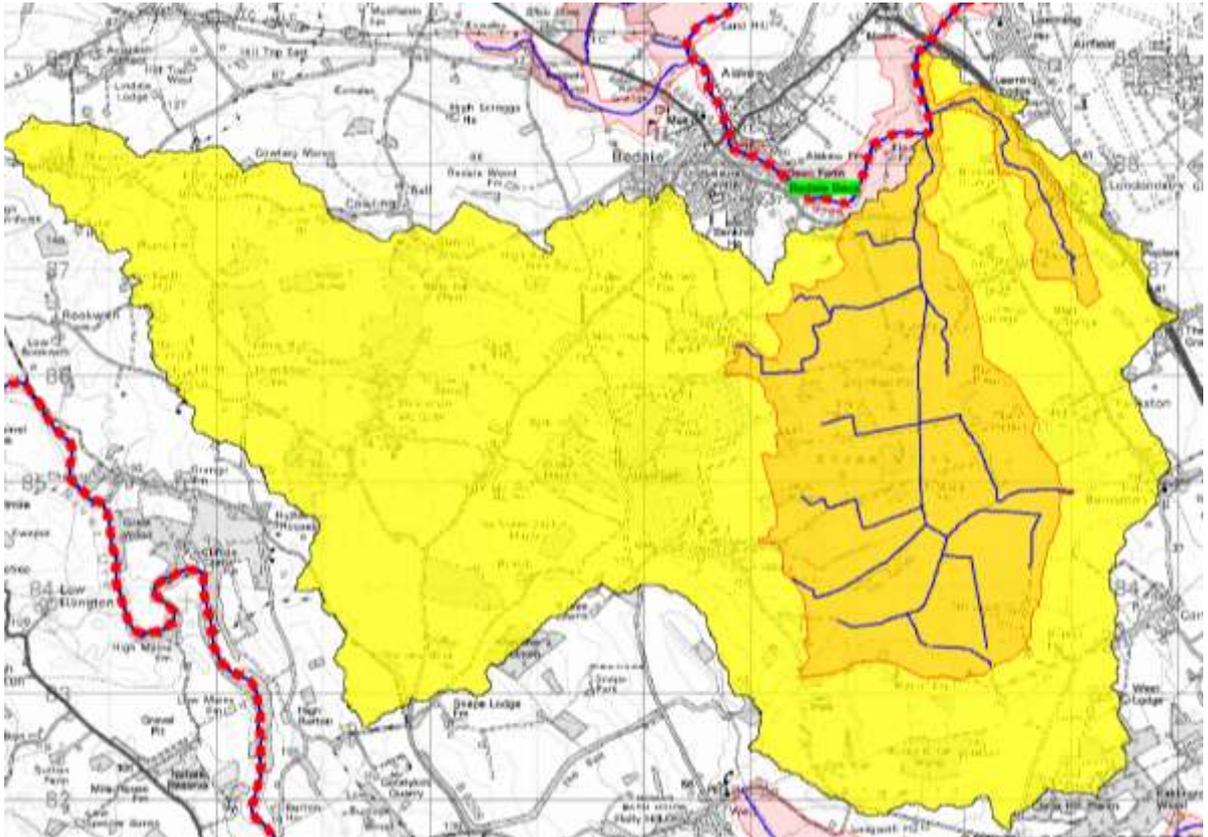
EA Bedale Beck and the surrounding Drainage Board watercourses



Snape Mires

The Drainage Board Snape Mires Catchment takes water from approximately 43.2km² of land, 10.2km² of which is within the Swale & Ure Drainage Board District. On two occasions the Drainage Board has carried out works to improve the flow of EA Bedale Beck for the benefit of Snape Mires Main Carrier.

Evacuation of water from the majority of the land within the Drainage Board at Snape Mires is reliant on the efficient working of Bedale Beck with direct correlation between water level within Bedale Beck and the watercourses of Snape Mires.



The map above shows the Swale & Ure Drainage Board's strategic main water carriers (blue), the Swale & Ure Drainage Board District (red) and total catchment size (yellow)*



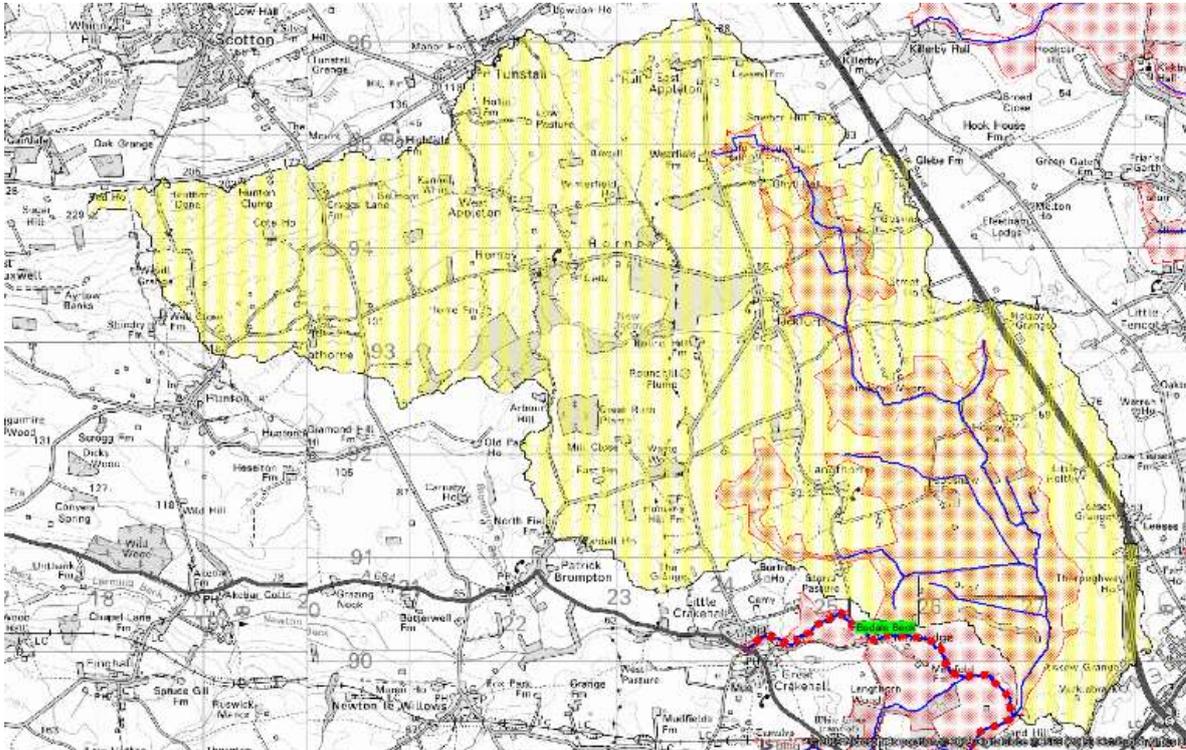
* Catchment size has been estimated by the EA Water Framework Directive initiative and does not incorporate data for culverted watercourses.

The photo shows Drainage Board Main Cut flowing parallel to EA Bedale Beck to obtain an appropriate water level for Snape Mires

Scurf Beck

The Drainage Board's Scurf Beck catchment takes water from approximately 32.6km² of land, 6.0 km² of which is within the Swale & Ure Drainage Board District.

On occasion the Drainage Board has carried out works to improve the flow of EA Bedale Beck for the benefit of Scurf Beck. Evacuation of water from the first 2km of Scurf Beck is reliant on the efficient working of Bedale Beck.



The map above shows the Swale & Ure Drainage Board's strategic main water carriers (blue), the Swale & Ure Drainage Board district (red) and total catchment size (yellow)*



* Catchment size has been estimated by the EA Water Framework Directive initiative and does not incorporate data for culverted watercourses.

The picture (left) shows a view of EA Bedale Beck just downstream of the Scurf Confluence. The blockages shown extend for approximately 800m and are directly responsible for bank scour and increasing the water level in the Scurf by 600-800mm.

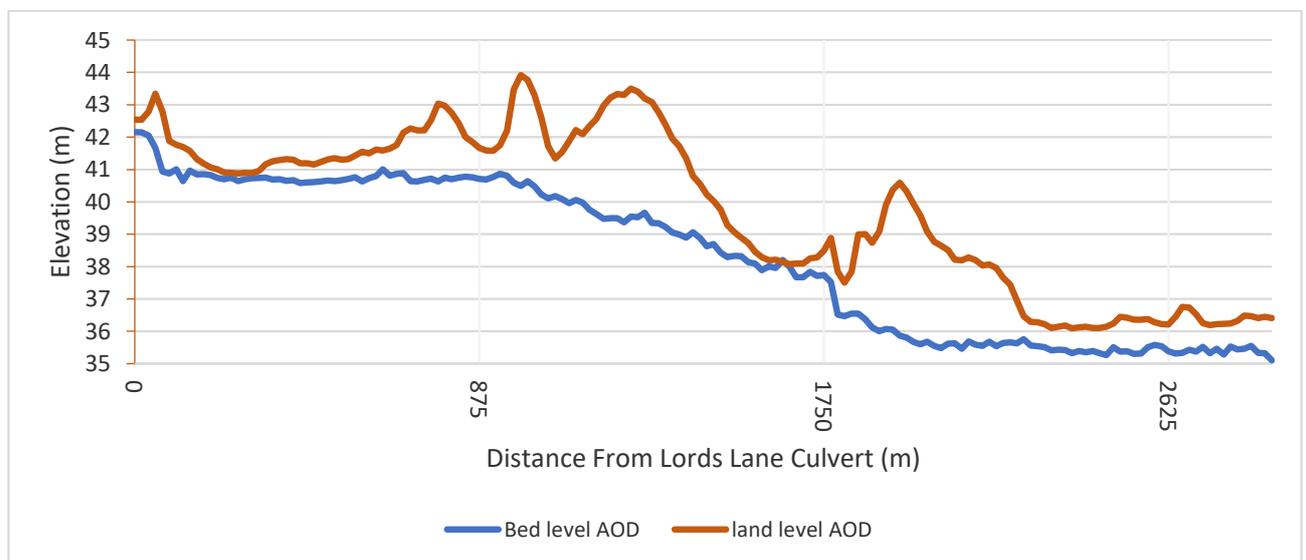
THE SCURF

The capacity and integrity of IDB watercourses are facing increased strain due to Climate change.

December 2015 was the wettest December, and indeed any calendar month, in the UK series since 1910. Rainfall reached 2 to 4 times the average in the west and north, with severe flooding in Cumbria in particular. A recent study showed that the heavy rains associated with Storm Desmond has been made about 60% more likely due to human-induced climate change.

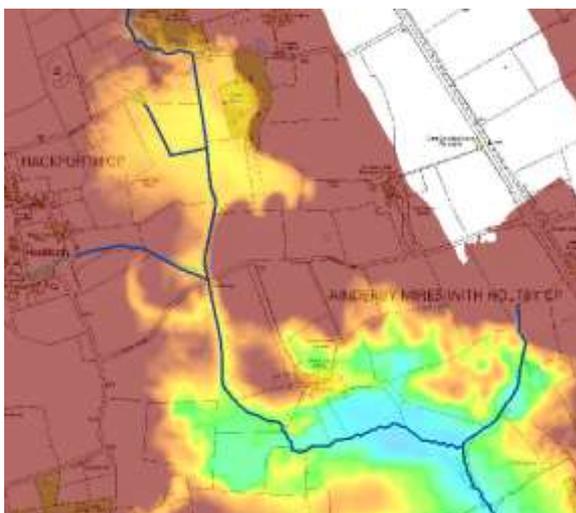
The IDB Infrastructure has changed very little in the last 170 years, the question has been asked: -

Can the Drainage Board cope with climate change and what issues will it cause us?



The chart (above) shows a “typical” topography for a Swale & Ure strategic main water carrier.

The chart shows that there are a series of ‘steps’ through the District. For example, between 0m and 875m the bed of the watercourse is level, for the following 875m the bed level descends at a rate of 1:300. Then the bed level rapidly decreases between 1750m and 1800m by 1.5m. 1800>2000m then continues at a rate of 1:300 before the bed level becomes level again.



The chart also shows how the watercourse has ‘cut’ through the landscape to drain the upper sections of the catchment.

The image [left] is a Lidar image of the catchment 45m>35m elevation which shows the Scurf running through its centre.

Status of the Main River

Within the Swale & Ure Drainage Board District there are currently 69.3km of EA Main River that were once maintained by the former Drainage Boards. Due to an evolution of priorities by the EA, it has had to reprioritise its time and resources on Urban Centres, in turn reducing the resources available to the upkeep of rural and agricultural watercourses that are important to the Swale & Ure Drainage Board.

De-mainment - Current National Situation

In 2015 the EA were proactively encouraging de-mainment from EA Main River Beck to IDB maintenance. This will cover eleven watercourses spread across the catchment, some of which will require bringing up to standard which will be taken into account before they are formally taken over.

Invasive Non-Native Species (INNS)

The spread of Invasive Non-Native Species such as Signal Crayfish or Giant Hogweed within the Drainage Board District may be seen to have long term detrimental effects on the operation of the Board.

The threat from INNS is twofold. Firstly, they are a threat to biodiversity as they are able to displace or directly harm native species in ecosystems that are not adapted to them and secondly, de-vegetation of streambanks in winter may lead to bank erosion and downstream sedimentation.



Some INNS can pose a public health threat and others can be economically detrimental.



The Board is looking to review what can be done, what should be done, and should the Board as a Government body be using its allotted funding to pursue the eradication of INNS within the District.

The Future

Manning's Formula gives Engineers a way to equate the relationship between water volume, channel slope and water velocity, simply stated the more water you have in a watercourse the faster it is going to flow.

The cohesion of any given riverbank or riverbed will only remain intact up to certain velocities, at this point the watercourses begin developing bank and bed scour.

The site visit today will demonstrate the current limitations of the Scurf and what the future is likely to bring.



Thank you for your attendance
We hope you have had an enjoyable Tour

