

**Environmental Impact Assessment  
North Howden Conveyance Scheme OH14  
Patenoster Drain**

EIA

North Howden Conveyance Scheme OH14

Patenoster Drain

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## 1 Introduction

### Background

- 1.1 Patenoster Drain runs along the northern edge of the Market Town of Howden, see Appendix A for location. It is fed from Marsh Drain, Howden New Cut and Duck Swang Drain before becoming Patenoster Drain, forming the North Howden Catchment. The feed drains flow clockwise from the south of Howden Minster around Howden Marsh LNR, around the north of the North Howden housing development site (HOW A – East Riding of Yorkshire Council’s Local Plan reference), along the north edge of Howden School and Technology College playing fields before joining Scuttlecroft Drain where it enters the North Howden Outfall.
- 1.2 The area of concern is on Patenoster Drain that runs to the north of two of the housing developments in HOW A through to its junction with Station Road. The total length of the works required on Patenoster Drain is 470m. The north bank of the drain is subject to slippage, risking blocking the drain and causing flooding downstream.
- 1.3 The North Howden Catchment (“the Catchment or Catchment Area”) is a sub-catchment of the River Ouse within the Ouse and Humber Internal Drainage District (IDB). The national grid reference is SE 7389 2914. See Appendix A for more details.
- 1.4 The drainage of this area is entirely reliant on systems operated by the IDB and the continued operation of two daisy-chained pumping stations, North Howden Pumping Station and Skelton Pumping Station, with Skelton Pumping Station being the terminal pumping station before discharging into the River Ouse.
- 1.5 A Modelling and Economics report has been produced for the North Howden Conveyance Scheme OH14 and is attached as Appendix A.
- 1.6 Works which are covered by The Environmental Impact Assessment (Land Drainage Improvement Works) (Amendment) Regulations 2017 include a project to deepen, widen, straighten; or otherwise improve or alter, any existing watercourse or remove or alter mill dams, weirs or other obstructions to watercourses, or raise, widen, or otherwise improve or alter, any existing drainage work.

## 2 Legislation

### 2.1 Summary of legislation

This section summarises the legislation, which is relevant, in ecological terms, to this assessment, i.e. legislation relevant to species present or potentially present within the survey area is included here along with legislation relevant to protected sites in the vicinity.

- Wildlife and Countryside Act 1981 (as amended);
- Countryside and Rights of Way (CROW) Act 2000;
- The Protection of Badgers Act (1992);
- Wild Mammals (Protection) Act 1996;
- The Conservation of Habitats and Species Regulations 2017 (as amended);
- Environment Act 1995;
- Natural Environment and Rural Communities (NERC) Act 2006.

#### 2.1.1 National Planning Policy

The National Planning Policy Framework (NPPF) published in 2019 by the Ministry of Housing, Communities and Local Government states that to protect and enhance biodiversity and geodiversity, plans should:

‘Identify, map and safeguard components of local wildlife-rich habitats and wider ecological networks, including the hierarchy of international, national and locally designated sites of importance for biodiversity; wildlife corridors and stepping stones that connect them; and areas identified by national and local partnerships for habitat management, enhancement, restoration or creation.’

And

‘Promote the conservation, restoration and enhancement of priority habitats, ecological networks and the protection and recovery of priority species; and identify and pursue opportunities for securing measurable net gains for biodiversity.’

The planning system should contribute to and enhance the natural environment by protecting and enhancing valued landscapes, geological conservation interests and soils, recognise the wider benefits of ecosystem services; and minimise impacts on biodiversity and provide net gains in biodiversity where possible, contributing to the Government’s commitment to halt the overall decline in biodiversity, included by establishing coherent ecological networks that are more resilient to current and future pressures.

### 2.3 **Habitat Legislation Statutory Protected Sites & Features**

- 2.3.1 Ramsar sites. Ramsar sites are designated under the Convention on Wetlands of International Importance, agreed in Ramsar, Iran, in 1971.
- 2.3.2 Special Areas of Conservation (SAC). SACs receive full protection under the European Commission (EC) Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora).
- 2.3.3 Special Protection Areas (SPAs). SPAs receive full protection under the EC Birds Directive (Council Directive 79/409/EEC on the conservation of wild birds).
- 2.3.4 Sites of Special Scientific Interest (SSSIs). SSSIs provide full statutory protection for the best examples of the UK’s flora, fauna, geological, or physiographical features. Originally notified under the National Parks and Access to the Countryside Act 1949, SSSIs are now notified under the Wildlife and Countryside Act 1981 (as amended). Improved provisions for the protection and management of SSSIs were introduced by the Countryside and Rights of Way Act 2000.
- 2.3.5 National Nature Reserves (NNRs). NNRs are fully protected from damaging operations within and around them under the National Parks and Access to the Countryside Act 1949 (as amended) and the Wildlife and Countryside Act 1981 (as amended).
- 2.3.6 Local Nature Reserves (LNRs). LNRs are designated under the National Parks and Access to the Countryside Act 1949 (as amended) as areas of geological or wildlife interest of special local interest.
- 2.3.7 Local Wildlife Sites (LWS) / Sites of Importance for Nature Conservation (SINC’s). LWSs and SINCs are identified by local planning authorities (in this case East Riding of Yorkshire Council) on account of their value for wildlife. These sites receive a measure of protection through local planning policies.

### 2.4 **Species legislation**

- 2.4.1 European protected species (EPS). These animals are fully protected through inclusion within Schedule II of The Conservation of Habitats and Species Regulations 2010 (as amended). This legislation makes it an offence to:
  - Deliberately capture, injure or kill any wild animal of an EPS.

- Deliberately disturb wild animals of any such species.
- Deliberately takes or destroys the eggs of such an animal.
- Damage or destroy a breeding site or resting place of such an animal.

For the purposes of this legislation, disturbance has been defined by the European Commission (EC) and Natural England as any disturbance which is likely to impair an EPSs ability to:

- Survive, breed or reproduce, or to rear or nurture their young, or
- In the case of animals of a hibernating or migratory species, to hibernate or migrate; or
- To affect significantly the local distribution or abundance of the species to which they belong.

#### 2.4.2 **EPS potentially present in the survey area:**

##### Badger

Badgers *Meles meles* receive protection under the Protection of Badgers Act 1992 and the Wildlife and Countryside Act 1981 (as amended), under Schedule 6, Section 11.

##### Great crested newt (GCN)

The primary legislative protection for GCNs *Triturus cristatus* is under the Habitats Regulations 1994 through designation as an EPS (see above). However, the GCN is also partially protected in England and Wales through its inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

##### Breeding birds

All wild birds in England and Wales are protected under Section 1 of the Wildlife and Countryside Act, 1981 (as amended) which makes it an offence to intentionally kill, injure or take any wild bird, or take, damage or destroy the nest (whilst being built or in use) or its eggs.

##### Common reptiles

All native common reptiles, i.e. slow-worm *Anguis fragilis*, common lizard *Lacerta vivipara*, adder *Vipera berus* and grass snake *Natrix natrix*, are listed on Schedule 5 of the Wildlife and Countryside Act 1981 (as amended) in respect of Sections 9(1) and 9(5) which makes it an offence to intentionally kill, injure or sell the animals. Rare reptiles (smooth snake and sand lizard) The primary legislative protection for rare reptiles is under the Habitats Regulations 1994 through designation as an EPS (see above). However, rare reptiles are also partially protected in England and Wales through their inclusion in Schedule 5 of the Wildlife and Countryside Act 1981 (as amended).

##### Water vole

Water voles *Arvicola terrestris* receive habitat protection through inclusion on Schedule 5 of the Wildlife and Countryside Act, 1981 (as amended) in respect of section 9(4) only. This section of the Act protects the water vole's place of shelter or protection (i.e. their burrows) but does not protect the voles themselves. Under the legislation it is an offence to intentionally or recklessly damage, destroy or obstruct access to any structure or place which water voles use for shelter or protection or to disturb water voles whilst they are using such a place.

Disturbance has been defined as any action which affects the survival chances, the breeding success or reproductive ability of one or more individuals or which leads to a reduction in the quantity of occupied habitat (Strachan & Moorhouse, 2006). Water voles have been recommended for inclusion on Schedule 5 of the Wildlife and Countryside Act, 1981 (as amended).

#### 2.4.3 **Invasive weeds**

*Heracleum mantegazzianum* giant hogweed, *Fallopia japonica* Japanese Knotweed and *Impatiens glandulifera* Himalayan Balsam are listed in Schedule 9, Part II of the Wildlife and Countryside Act

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1981 (as amended) which makes it an offence to plant these species or otherwise cause them to grow in the wild. Any material containing Japanese knotweed or giant hogweed is also identified as 'controlled waste' under the Environment Protection Act 1990 and must be disposed of properly at landfill.

- 2.4.4 Rare and/or protected plants. Some plants are listed on Schedule 8 of the Wildlife and Countryside Act 1981 (as amended) which makes it an offence to intentionally pick, uproot, destroy or trade in these plants. Other plants appear on national red data lists, or are considered nationally, regionally or locally scarce, though these classifications do not confer any legal protection.
- 2.4.5 Other invertebrates.. In England and Wales the Wildlife and Countryside Act 1981 (as amended) and The Conservation of Habitats and Species Regulations 2010 (as amended) offer legal protection to certain invertebrate species. Under the aforementioned legislation, 17 invertebrate species in Britain have European protection and 45 species in England and Wales are fully protected at a national level.
- 2.4.6 Other mammals. All non-domesticated mammal species including common species, such as rabbit *Oryctolagus cuniculus* and deer, receive protection under the Wild Mammals (Protection) Act 1996. This act protects wild mammals from certain cruel acts and makes it an offence to intentionally inflict unnecessary suffering on wild mammals.

## 3 Ecological Survey

- 3.1 A desktop study was used to guide the field survey as it was an inappropriate time of year to undertake any actual on site surveys. The following sources were used to collate historical records within the study area and surrounding 2km radius:
  - Multi Agency Geographic Information Centre website ([www.magic.gov.uk](http://www.magic.gov.uk))
  - North and East Yorkshire Ecological Data Centre (NEYEDC)
- 3.2 A walk over assessment of the drain was undertaken on the 25 November 2021. The north bank of the drain is covered in grass that is cut back on an annual basis. There is some aquatic vegetation in the drain bottom, again this is cut back on an annual basis. The richest element of the drain, ecologically speaking is the south bank which is not being disturbed.
- 3.3 The Modelling and Economics report for the North Howden Conveyance Scheme OH14 shows the area of flooding if the drain is blocked due to slippage, see Appendix A.
- 3.3 The results of the data from NEYEDC show no data for this section of the drain. The main records are for Howden Marsh LNR some 0.7km to the south and the most recent record is 2012, see Appendix D.
- 3.4 Both the Lower Derwent Valley, as far south as Wressle and the Humber Estuary from Boothferry Bridge east are Ramsar sites.
- 3.5 The Lower Derwent Valley, as far south as Barmby on the Marsh and the Humber Estuary from Boothferry Bridge east are Special Areas of Conservation.
- 3.6 The Lower Derwent Valley, as far south as Wressle and the Humber Estuary from Boothferry Bridge east are Special Protection Areas.
- 3.7 There are Special Sites of Scientific Interest at Barnhill Meadows and along the length of the River Derwent as far south as Barmby on the Marsh. The Humber Estuary from Boothferry Bridge east is also a SSSI.
- 3.8 The nearest National Nature Reserve is to the north in the Lower Derwent Valley (north of Wressle and at Bubwith).

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- 3.9 Howden Marsh is a register Local Nature Reserve, a Local Wildlife Site and Common Land with registered open access under the CROW Act 2000.
- 3.10 Locations of the sites above that fall with in the North Howden Conveyance Scheme along with other designations can be found in Appendix B.
- 3.11 There are no recorded fauna or flora that come under European Protected Species within the section of Patenoster Drain in question. There are however a small number of rodent holes on the south bank that might be Water Voles but there are also a large number of holes further along the drain to the west that are being used by rats. It is unlikely to be Water Vole using the holes in the south bank of the section of Patenoster Drain in question. Further survey work would be required to confirm, see 2.4.2 above.
- 3.12 Although there are no signs of invasive plants in the drain there is a record of Himalayan Balsam on Howden Marsh. Flooding of Howden Marsh due to a blockage in Patenoster Drain could allow the spread of seeds to other areas especially along the drain as the waters recede, see section 2.4.3 above.

## 4 Impacts from flooding

- 4.1 The Modelling and Economics report for the North Howden Conveyance Scheme shows the extent of flooding if the drain is blocked.
- 4.2 Up to 46 existing properties are at risk as a result of long term flooding. In addition a number of environmental features would also be at risk, see Appendix B for more details. There is also the risk of a blockage in Patenoster Drain causing flooding across the HOW A housing development as their surface water SUDS would not be able to function as they discharge into the Patenoster Drain.
- 4.3 In addition to the risk of flooding 46 properties, over a long period of flooding there is a risk of the flood waters, as a result of Patenoster Drain being blocked entering other water courses and drains causing concerns in other areas.
- 4.4 Flood water could enter Husbandmans Drain and Treeton Drain placing increased pressure on the Howden Dyke Pumping Station and also if the flood water entered the foul sewer system it would have a serious consequences on other areas of Howden, not directly affected by the flooding caused by a blockage in Patenoster Drain.
- 4.5 Howden has an old network of combined sewers as well as separate foul and surface water sewers. At periods of high rain fall and high ground water levels the main Yorkshire Water pumping station (PS) at Broad Lane cannot cope. This PS is fed by two smaller PS on Bell Cross and Treeton Road. When Broad Lane is overwhelmed it can discharge, under licence into Howden Dyke Drain, pumping foul sewerage into an open drain. It can also turn off the other two PS that feed it. The only storage is in the pipe network which has a record of not being able to cope, resulting in foul sewerage water flowing back up the pipes and entering gardens and properties (via toilets and sinks).
- 4.6 Howden Marsh LNR is an area of public access with open drains running either side of it. There is a large body of water in the middle of the site. The historical ecological records from NEYEDC for the 2km around the Paternoster Drain are mainly for Howden Marsh LNR. Any prolonged periods of flooding and the subsequent waters receding could have a negative effect on the ecology of Howden Marsh LNR. There is a risk that a lot of the species recorded, especially in the water body could be pulled away from the site with receding waters.

## 5 Proposed development

- 5.1 The section of drain in question runs from a farm access bridge and Yorkshire Water mains water pipe crossing at approximate OS grid ref SE746289 through to its junction with Station Road at OS grid ref SE750289 is approximately 470m. The northern bank is subject to slippage. The drain bank to the north is some 3.10m in length from drain bed to the top of the bank. In places it is bulging with areas of slippage and with signs of potential slippage cracks forming. The north side of the drain is the side (arable farm field) where the drain is maintained from.
- 5.2 The north bank of the drain is open arable farm land. The local geology consists of a mix of clays in sedimentary layers above mudstone and sandstone bedrock. The area has very low permeability. The south bank has an old hedge line of trees (mainly Elm) running along the top of the bank and a public right of way (Howden Footpath No 1 which is also part of the Howden 20 route). Immediately to the south is HOW A housing development of some 650 properties. There is very little sign of any slippage on the south bank.
- 5.3 There is a wooden toe to both sides of the drain. In places on the north bank this toe has broken due to the force of the bank it is holding back.
- 5.3 The proposal is to put a 5m wide berm in the north bank approximately 1.5m off the drain bed and re-profile it to a 1:2 batter both from the drain bed to the berm and from the berm to the bank top. See Appendix C for more details. This will reduce the working height for the maintenance, reduce the angle of the banks and increase the storage capacity of the drain at high rain periods.
- 5.4 It is estimated that there will be approximately 7050m<sup>3</sup> of soil to dig out and remove from site. Recent trial digs have indicated that the soil is not suitable to be left on site or used as on the neighbouring farmland. This will have to be transported in 40 tonne wagons either north along Station Road or south through Howden via Flatgate and Hull Road to the A614. Full details of the extraction, transport and disposal are not available at this time.
- 5.5 Alternative modelling has been considered including wooden and metal piling. There is a national shortage of suitable timber for wooden piles. Wooden piles would not be strong enough due to the height of banking they would have to hold back. Metal piles would be strong enough but would be very unsightly in this location. The cost of steel at this time would also make it uneconomical to use. The depth of the drain would still require a larger excavator to reach down to clean the drain bottom, putting pressure on the drain top, putting the bank at continuous risk of slippage which in turn would have a direct effect on the arable land running along the top of the drain.

## 6 Conclusions and Environmental Recommendations

### Conclusions

- 6.1 If the Paternoster Drain blocks due to the north bank slipping and the drain backs up during a period of heavy rain there is a possibility of a minimum of 46 houses, possibly more being flooded, Howden Dyke pumping station being over whelmed with excess drain water and the foul water sewerage system closing down due to excess water causing the pumping stations to switch off and insufficient storage in the system leading to foul water flooding in properties across Howden not effected directly by the backed up water from Paternoster Drain.
- 6.2 If the drain is left as is there will be a need for more repairs to the banks as well as annual maintenance, an increase in machinery activity and budget
- 6.3 Although the actual drain is poor ecologically there is a possibility of harming other ecological assets in the catchment, mainly Howden Marsh LNR.

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- 6.4 By undertaking the proposed works – widening the drain and inserting a low lever berm to remove the pressure on the north bank – the anticipated flooding will not occur.
- 6.5 There will be increased water storage in the drain as a result of the works to make the north bank safe, improving the drains functionality as part of the North Howden Catchment.
- 6.6 There is the opportunity to improve the ecological function of the drain by planting common reed *Phragmites australis* and a grass and wildflower seed mix along the new berm and banks which can be managed as part of the annual maintenance of the drain. This new planting will over time provide a rich habitat for birds, insects and reptiles.

#### Environmental Recommendations

- 6.5 All works are undertaken outside of the breeding season – March to late summer
- 6.6 An ecological walk over survey is undertaken before any works are started
- 6.7 All loose soil is either removed from site once it has been dug or is firmed down each night to prevent any animals in the area using it as a resting spot overnight.
- 6.8 All voids are filled in, covered over or have ramps in the them
- 6.9 All equipment is checked each morning for any resting animals
- 6.10 The site compound is kept to the minimum and all waste, emissions etc. are kept to a minimum or disposed of in the most environmentally friendly manner possible.
- 6.11 All materials removed from site are transported to the nearest storage facility via the route that will cause least disturbance to the residents of Howden. Wheel wash facilities will be required to reduce the impact on the highway
- 6.12 All waste transfer regulations are complied with
- 6.13 The berm is planted with common reed on completion and the re-profiled banks are re-seeded with a seed mix that will benefit pollinating insects.