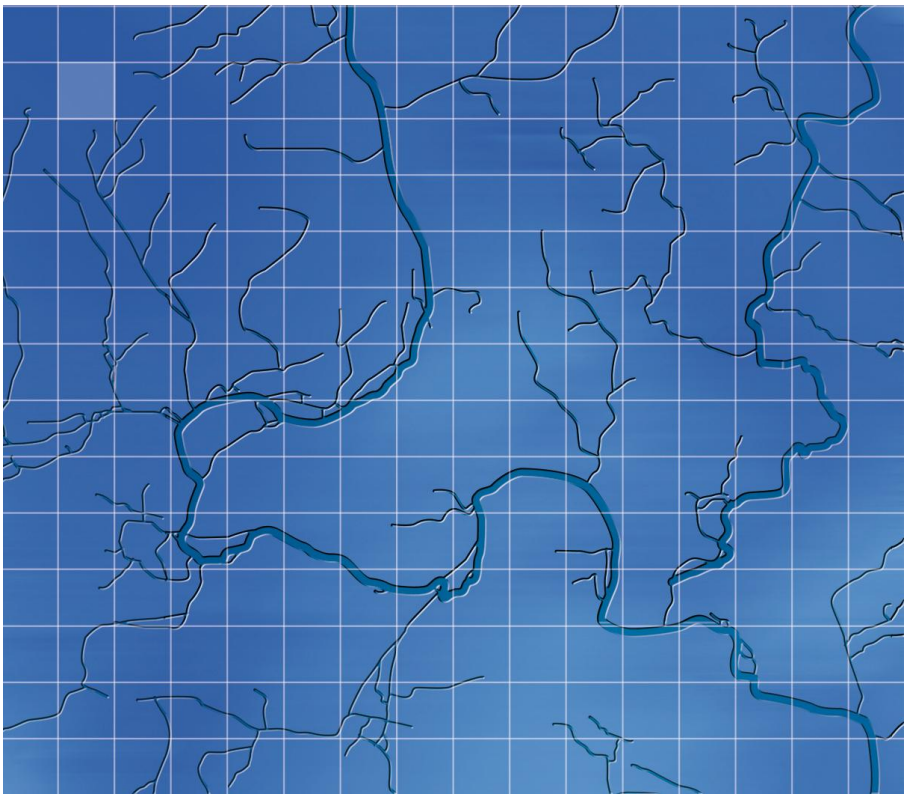
North East Lincolnshire Council

August 2026

North East Lincolnshire Water Cycle Study



North East Lincolnshire Council

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Document issue details

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1.1	21/08/2026	Draft	Jasmine Lucas (*Consultant*)	Daniel Hamilton (*Principal Consultant*)

For and on behalf of Wallingford HydroSolutions Ltd.

The WHS Quality & Environmental Management system is certified as meeting the requirements of ISO 9001:2015 and ISO 14001:2015 providing environmental consultancy (including monitoring and surveying), the development of hydrological software and associated training.

Registered Office Stables 4, Howbery Business Park, Wallingford, OX10 8BA
www.hydrosolutions.co.uk

Contents

Glossary

90th Percentile (90th%ile)	The 90th percentile is a value that's greater than 90% of the numbers in a set. It is a useful statistic for measuring performance data and identifying anomalies.
95th Percentile (95th%ile)	The 95th percentile is a value that's greater than 95% of the numbers in a set. It is a useful statistic for measuring performance data and identifying anomalies.
Abstraction licence	Authorisation granted by the Environment Agency to allow the removal of water from a source.
Ammonia	Ammonia is an inorganic chemical compound of nitrogen and hydrogen with the formula NH_3. It is used as a fertilizer, cleaning product and in the production of plastics. Sewage is also a source of ammonia.
Assessment Point (AP)	A significant point on a river, often where two major rivers join or at a gauging station.
Asset Management Period (AMP)	The AMP sets the framework for how water companies manage their assets, deliver services to customers, and invest in infrastructure over a five-year period. The AMP is regulated by Ofwat, the Water Services Regulation Authority in England and Wales. AMP 7 ran from 2020-2025, AMP8 runs from 2025-2030.
Biochemical Oxygen Demand (BOD)	BOD is a measure of how much oxygen is used to break down organic matter in water. It is an important indicator of water quality and organic pollution. A high BOD indicates that there is more organic pollution in the water. BOD is used to measure the level of organic pollution in wastewater before it's released to a watercourse.
Combined Sewer Overflows (CSOs)	Many parts of England have a combined sewage system with clean rainwater and wastewater conveyed in the same pipe. During heavy rainfall the capacity of these pipes can be exceeded, which means possible backing up of the system and inundation of Water Recycling Centres (WRCs) downstream. CSOs were developed as overflow valves to reduce the risk of sewage backing up during heavy rainfall. They are a necessary part of the sewer system but where they regularly spill it can indicate underlying issues with the sewer system's condition and capacity.
Compliance Assessment Report (CAR)	A written report compiled by Environment Agency officers when assessing compliance with an environmental permit. The CAR is used to record the findings of the EA's site inspections, audits and monitoring activities. It also includes reviews of monitoring and other data/reports.
Deployable Output (DO)	The reliable output of an active source, or group of sources, or of a bulk supply of water, which is constrained by: environment; licence, if applicable; pumping plant and/or well/aquifer properties; raw water mains and/or aquifers; transfer and/or output main; treatment; water quality.
DG5 Sewer Flooding	Director General 5 (DG5) is a measure established by Ofwat to monitor the number of properties at risk of flooding from sewers. The DG5 register, produced by water companies, contains information of properties that have been flooded internally and externally by sewage or are considered to be at risk from flooding in the future.
Discharge Permit	An environmental permit granted by the Environment Agency to discharge liquid effluent or waste water to a surface water or the groundwater body.

District Metering Area (DMA)	A DMA is a discrete area of the water distribution network that can be isolated by closing valves so that the quantities of water entering and leaving the area can be metered. The volume of water into and out of the DMA is measured by a district meter. The purpose of a DMA is to divide each WRZ into manageable sections to detect and determine the location of burst mains, calculate the level of leakage in each DMA and compare DMAs so that activities can be targeted to where they will have the greatest impact in reducing leakage.
Drainage and Wastewater Plan (DWMP)	Strategic plans where wastewater companies take a company-wide approach to managing their wastewater and drainage assets. DWMPs look at current and future capacity, pressures, and risks to their networks such as climate change and population growth over a 25-year period.
Drought Order	A drought order is a legal instrument in the UK used during exceptional water shortages to manage resources, allowing water companies to take more water from the environment or restrict non-essential water usage. They are granted by DEFRA. Relative to a drought permit, orders are broader, enabling stricter demand restrictions and covering more complex environmental or third-party impacts.
Drought Permit	An authorisation granted by the Environment Agency under drought conditions, which allows for abstraction/impoundment outside the schedule of existing licences on a temporary basis. Permits allow quicker, simpler changes to abstraction licences relative to wider reaching drought orders.
Dry Weather Flow (DWF)	DWF is the average daily flow to a WRC during a period without rain. The EA sets limits on the quality and quantity of treated effluent from a WRC so that the WRC do not cause an unacceptable impact on the environment. The flow that may be discharged in dry weather is one of these limits.
Dry Year Annual Average (DYAA)	The annual average value of water demand, deployable output or some other quantity over the course of a dry year.
Dry Year Critical Period (DYCP)	The water demand, deployable output or some other quantity during the time in a dry year when demand is greatest, often termed the peak week. Also commonly known as the summer peak period.
Environment Agency (EA)	The Environment Agency (EA) is a non-departmental public body, established in 1996 and sponsored by the UK government's Department for Environment, Food and Rural Affairs (DEFRA). Their responsibilities include water quality and resources, fisheries, inland river, estuary and harbour navigations, conservation and ecology, regulating major industry and waste, treatment of contaminated land and managing the risk of flooding from main rivers, reservoirs, estuaries and the sea.
Environmental Destination	The EA's "Environmental Destination" for water resources is a long-term (2050) strategy in England designed to restore and protect the water environment by quantifying necessary changes to water abstraction. It calculates how much water usage must be reduced to ensure a sustainable, healthy environment for ecosystems, factoring in climate change and future population growth.
Environmental Impact Assessment (EIA)	EIA is a tool used to assess the significant effects of a project or development proposal on the environment.
Flood Zone 1	Areas situated in Flood Zone 1 have a low probability of flooding, with less than a 0.1% probability of river or sea flooding.

Flood Zone 2	Areas situated in Flood Zone 2 have a medium probability of flooding and have an annual probability of river flooding between 1.0% and 0.1% or an annual probability of sea flooding between 0.5% and 0.1%.
Flood Zone 3a	Areas situated in Flood zone 3a have a high probability of flooding, with a 1% or greater annual probability of river flooding or a 0.5% or greater annual probability of sea flooding.
Flood Zone 3b	The functional floodplain. This is where water from rivers or the sea has to flow or be stored in times of flood. Local authorities should identify areas of functional floodplain in their Strategic Flood Risk Assessment.
Flow to Full Treatment (FFT)	A measure of how much wastewater a treatment works must be able to treat at any time. All WRCs are built to be able to deal with a certain amount of wastewater, calculated depending on the area they serve, and many have a requirement in their environmental permit about the FFT level they must work to.
Good Ecological Potential (GEP)	GEP is the ecological quality that can be achieved in the affected water bodies without a significant adverse impact on the benefits provided by the uses or a significant adverse impact on the wider environment.
Groundwater Infiltration	Groundwater infiltration occurs when groundwater finds its way into the underground water and sewerage system. Small leaks, openings, defective joints and cracks are the main causes for infiltration.
Habitat Regulations Assessment (HRA)	A HRA is a process that determines whether development plans could negatively impact local plans on a recognised protected European site.
Hands off flow (HoF)	A condition attached to an abstraction license which states that if flow (in the river) falls below the level specified on the license, the abstractor will be required to reduce or stop the abstraction.
Headroom (Sewage Treatment)	Headroom refers to the remaining capacity a treatment facility has to process additional wastewater flow. It is measured as the difference between the measured DWF and the consented DWF.
Headroom (Water Resources)	A planning buffer between water supply (Water Available for Use - WAFU) and demand, designed to manage uncertainties like climate change, population growth, and infrastructure outages. Target Headroom is the minimum, risk-based margin water companies plan to maintain to guarantee service levels.
Household (HH) Consumption	Water consumed by household customers.
Leakage	Water that leaks from sewers, water mains and customer supplies pipes.
Load Standstill	An improvement in the quality of effluent, so that extra pollution load will not result in a deterioration in the water quality of the watercourse.
Monte Carlo Simulation	A Monte Carlo simulation is a way to model the probability of different outcomes in a process that cannot easily be predicted due to the intervention of random variables. It involves repeatedly generating random input values within a defined probability distribution to model a complex system and analysing the range of possible outcomes.
Natural Flood Management (NFM)	NFM involves working with nature to reduce the risk of flooding for communities. It uses various techniques to restore or mimic the natural functions of rivers, floodplains and the wider catchment.

Non-Household (NHH) Consumption	Water consumed by businesses.
Olfactometry	Olfactometry is the process of measuring the concentration and intensity of odour. Olfactometry is often used for monitoring wastewater infrastructure, where controlling odorous emissions is important for environmental and health reasons.
Orthophosphate	Orthophosphate is a phosphorus compound. It is commonly used for water treatment.
Price Review (PR)	The price determination process undertaken by Ofwat every five years. Each water and sewerage undertaker submits a business plan covering the five-year period for which Ofwat will determine cost and revenue allowances.
Sewage	Sewage is a subset of wastewater (see definition below), generally referring to the liquid waste from domestic uses including toilets and kitchens.
Sewage Pumping Stations (SPS)	SPS typically move sewage from lower to higher elevations. The stations pump raw sewage and wastewater into pipes transporting the waste to a WRC or other disposal site.
Sewage Treatment Works (STW)-	Sewage treatment works are plants designed to treat and clean sewage and wastewater before it is released into the environment. Treatment typically consists of three phases termed primary, secondary and tertiary water treatment.
Sewerage	The physical infrastructure including the underground network of pipes, pumping stations, manholes, and treatment facilities, used to collect, transport, and process wastewater and surface runoff
Simulation of Catchments (SIMCAT)	SIMCAT is the EA's randomised water quality river model. It is a crucial tool for setting and reviewing discharge permits at a catchment scale and to quantify the source apportionment of both point and diffuse pollutant load within the receiving watercourse. Driven by summary statistics of flow and quality, SIMCAT uses Monte Carlo simulation to predict in-river summary statistics for direct comparison with environmental quality standards.
Site of Specific Scientific Interest (SSSI)	A SSSI is a formal conservation designation. Usually, it describes an area that's of particular interest to science due to the rare species of fauna or flora it contains (Biological SSSI) - or important geological or physiological features that may lie in its boundaries (Geological SSSI).
Smarter Business Visit (SBV)	A location-based business programme that helps customers to fit water-saving devices, identify and potentially fix leaking toilets and fit free urinal controls if practical.
Source Protection Zones (SPZs)	SPZs are defined around large and public potable groundwater abstraction sites. The purpose of SPZs is to provide additional protection to safeguard drinking water quality through constraining the proximity of an activity that may impact upon a drinking water abstraction.
Special Area of Conservation (SAC)	A site designated as being of special conservation value under the Conservation of Habitats and Species Regulations 2017. It protects one or more special habitats and/or species – terrestrial or marine.
Storm Overflow Assessment Framework (SOAF)	The SOAF written by the Environment Agency sets out how sewer systems comply with current statutory requirements. The framework shows that any overflow reported to exceed the spill frequency thresholds set out in this document should be investigated.
Sustainable Drainage	SuDS mimic nature and typically manage rainfall close to where it falls. SuDS can be designed to transport (convey) surface water and slow runoff down (attenuate) before it enters watercourses. They provide areas to store

Systems (SuDS)	water in natural contours and can be used to allow water to soak (infiltrate) into the ground or evaporated from surface water and lost or transpired from vegetation (known as evapotranspiration).
Sustainability Reductions	Sustainability Reductions are mandatory reductions to a water company's licensed abstraction volumes, set by the EA. These reductions ensure that abstraction levels do not lead to environmental deterioration.
Technically Achievable Limits (TALs)	Technically Achievable Limits (TALs) define the lowest numeric concentration of a given pollutant that conventional wastewater treatment technologies can reliably achieve. In the UK, TALs are central to environmental permits and nutrient neutrality regulations.
Total Phosphorous	Total phosphorus (TP) is the sum of all phosphorus in a sample, including dissolved and particulate forms. I' is a key measurement used to assess water quality and wastewater treatment. Sewage, fertilizer and urban runoff are key sources.
Urban Creep	Urban creep is the increasing density of development, due to extension, paving over of gardens and other permeable areas, which increases the impermeability of developed areas and causes rates and volumes of runoff to rise.
Wastewater	Wastewater is the broad term for water that has been used and requires treatment before returning to the environment. Wastewater includes water discharged from domestic, industrial, commercial, and agricultural activities.
Water Available for Use (WAFU)	The overall amount of water that is available to use. This takes account of the total deployable output minus water lost through planned and unplanned events, sustainability reductions, climate change, water transferred out of a supply area to other companies (exports) and water received from other companies (imports).
Water Framework Directive (WFD)	The Water Framework Directive (WFD) 2000/60/EC is an EU directive to establish a framework for the protection of all water bodies, this was transposed into UK law through the Water Environment (Water Framework Directive) (England and Wales) Regulations 2017. The WFD set a programme and timetable for Member States to set up River Basin Management Plans by 2009, which are then periodically updated every 5-years.
Water Recycling Centre (WRC)	This is the term Anglian Water use to refer to Sewage treatment works. They are plants designed to treat and clean sewage and waste water before they are released into the environment. Treatment typically consists of three phases termed primary, secondary and tertiary water treatment.
Water Resource Management Plan (WRMP)	WRMPs set out how water companies intend to achieve a secure supply of water for their customers and a protected and enhanced environment. Water companies in England or Wales, must prepare and maintain a WRMP every 5-years to align with the AMP.
Water Resource Zone (WRZ)	The largest possible zone in which all resources, including external transfers, can be shared and hence, the zone in which all customers will experience the same risk of supply failure from a resource shortfall.
Water Services Regulation Authority (Ofwat)	The Water Services Regulation Authority, or Ofwat, is the body responsible for economic regulation of the privatised water and sewerage industry in England.
Water Trading	An agreement with an existing licence holder to give part or all of their water abstraction right permanently or temporarily.

Water Treatment Works (WTW)	A plant that treats water to a specific standard, often to produce potable water.
Windfall Development	Development not specifically allocated in a development plan but unexpectedly becomes available during the lifetime of a plan.

1 Introduction

1.1 Scope of Assessment

Wallingford HydroSolutions (WHS) has been commissioned by the North East Lincolnshire Council to undertake a water cycle study to support the council's emerging Local Plan 2026-2043.

It reviews the infrastructural capacity of water resources and wastewater infrastructure within the borough, before assessing the environmental capacity of the receiving water environment. This review draws on available information and data provided by stakeholders, alongside further detailed analyses, including headroom assessments and water quality modelling for water recycling centres (WRCs) affected by development proposed in the local plan.

The study will form part of the evidence base for the local plan and will inform polices and the infrastructure needed to support the delivery of sustainable future development.

1.2 Water Cycle Study Report Objectives

Water cycle studies are voluntary studies that consider how strategic plans and development proposals will affect the water environment. The study's objectives include the following:

- Review the North East Lincolnshire Council extent and amount of proposed development.
- Communicate with key stakeholders including North East Lincolnshire Council, the Environment Agency (EA), Anglian Water and Neighbouring Authorities.
- Review existing literature and evidence on water resources, water quality, flood risk and other environmental constraints.
- Identify environmental issues, constraints on development and potential solutions based upon this review.
- Determine the quantum of development expected within 4 key WRC catchments to 2043.
- Undertake a headroom assessment for each of the 4 WRCs to determine projected changes in flows against permitted levels, identifying where there may be capacity concerns.
- Outline recommendations for future development and actions for regulators to manage projected changes in headroom.
- Undertake review of water quality impacts as a result of increased flows from WRCs considering headroom findings and WFD status of receiving waterbodies.
- Undertake additional water quality modelling at WRCs with limited headroom and draining to poorly performing water bodies. This modelling considers current technology and incorporates Technically Achievable Limits (TAL) agreed with the EA.
- Outline recommendations for future development and actions for regulators to manage expected and projected changes in water quality.
- Inform wider policy planning requirements based on study's findings.

2 Method Statement

This study has been completed following the EA's national guidance on the preparation of water cycle studies[1], with the outcomes of both the scoping and detailed stages reported simultaneously. It has also been guided by the specification provided by and further consultation with North East Lincolnshire Council and Anglian Water.

The Water Framework Directive[2], which is transposed into UK law by the Water Environment Regulations[3], has been a key piece of legislation used to inform this study. It sets out a target for all waterbodies to reach good ecological status and prevent deterioration, both for the waterbody as a whole and for any individual element assessed.

Development of the water cycle study has been underpinned by early stakeholder liaison and collaboration. The primary stakeholders identified to inform the study include the EA and Anglian Water; the sewerage and water supplier for the borough. Other stakeholders include neighbouring local authorities. These organisations have been engaged to provide relevant datasets and to support a clearer understanding of the challenges affecting the water environment and infrastructure within the borough as well as across the wider region.

2.1 Data Sources

Following the initial liaison stage the following key data sources were used to inform the water cycle study.

- Anglian Water, Water Resources Management Plan 2024[4,5] - to determine future water demand and water resource options for the borough and wider Anglian Water supply area.
- Anglian Water Lincolnshire East Water Resource Zone Summary[5] - to determine Anglian Water's future plans with regard to drainage and wastewater infrastructure in the study area.
- Anglian Water, Drainage and Wastewater Management Plan (DWMP)[6] - to determine Anglian Water's future goals with regard to drainage and wastewater infrastructure.
- Anglian Water Red, Amber and Green (RAG) Reports[7]- To identify local pressures on the clean and wastewater sewer network in the context of future development.
- EA Humber River Basin Management Plan[8] - to help understand current and existing pressures on the water environment and mitigation measures.
- EA Catchment Data Explorer[9] – to collect data on the WFD status of waterbodies within the borough.

Commented [D1]: Comment to NELC- Report will be updated once we receive this data.

[1] Environment Agency (2021) *Guidance - Water Cycle Studies.* https://www.gov.uk/guidance/water-cycle-studies
[2] European Commission, *Water Framework Directive (2000)*, http://ec.europa.eu/environment/water/water-framework/index_en.html
[3] UK Government (2017) *The Water Environment (Water Framework Directive) (England and Wales) Regulations 2017.* https://www.legislation.gov.uk/uksi/2017/407/contents
[4] Anglian Water (2025) *Water Resources Management Plan 2024.* https://www.anglianwater.co.uk/corporate/strategies-and-plans/water-resources-management-plan
[5] Anglian Water (2025) *WRMP24 Technical Document. Lincolnshire East Water Resource Zone Summary.* https://www.anglianwater.co.uk/corporate/strategies-and-plans/water-resources-management-plan
[6] Anglian Water (2023) *Drainage and Wastewater Management Plan (DWMP).* https://www.anglianwater.co.uk/corporate/strategies-and-plans/drainage-wastewater-management-plan
[7] TBC
[8] Environment Agency (2022) *Humber river basin district river basin management plan: updated 2022.* https://www.gov.uk/guidance/humber-river-basin-district-river-management-plan-updated-2022
[9] Environment Agency (2025) *Catchment Data Explorer.* https://environment.data.gov.uk/catchment-planning

- EA Abstraction License Locations[10] - To gain spatial understanding of current abstractions to determine future management.
- EA Grimsby, Ancholme and Louth abstraction licensing strategy[11] - to understand current abstraction constraints and licensing strategies to determine future management.
- EA Combined Sewer Overflow Datasets[12] - to assess the changes in combined sewer overflows overtime and identify key spills.
- EA Fluvial Flood Maps[13] – to quantify fluvial flood risk across the study area.
- EA Surface Water Flood Maps[14] – to quantify the pluvial flood risk across the study area.
- Anglian Water DG5 sewer flooding data[15] – To determine areas at risk of sewer flooding and where capacity issues may exist.
- Proposed North East Lincolnshire Local Plan 2043 development sites and trajectory[16] - To determine future development and localised demand.
- Anglian Water measured daily flow data for the years 2020-2025[17] - used to estimate Q80 and Q90 flows.
- Anglian Water WRC catchment extent data[18] - to identify development draining to specific WRCs.
- EA discharge permits at each WRC[19] - Used to extract the permitted DWF. These were cross checked with the EA before undertaking the assessments
- SIMCAT model for the River Trent Basin[20] - To model water quality impacts in surface waterbodies as a result of development.

2.2 Structure of Study

The first stage of the study identifies the baseline conditions of the water environment and the potential constraints to growth within the borough. Information has been gathered on precipitation, surface water, groundwater, water quality, land use, designated sites, and flood risk.

After establishing the baseline conditions, the following three elements have been assessed:

- Water resources and supply
- Wastewater infrastructure, water quality and environmental capacity
- Flood risk
- Other environmental constraints

The study has reviewed these four elements in the context of planned and proposed development across North East Lincolnshire and climate change. Opportunities to manage future development and protect and enhance the water environment have been identified, alongside any evidence gaps and constraints on development.

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[10] EA (2026) *EIR2026_21256 – EA – May2026.xlsx*
[11] Environment Agency (2020) *Grimsby, Ancholme & Louth Abstraction Licensing Strategy.*
[12] EA (2026) Event Duration Monitoring – Storm Overflows – Annual Returns. https://www.data.gov.uk/dataset/19f6064d-7356-466f-844e-d20ea10ae9fd/event-duration-monitoring-storm-overflows-annual-returns
[13] Environment Agency (2026) *Flood Map for Planning – Flood Zones.* https://environment.data.gov.uk/dataset/04532375-a198-476e-985e-0579a0a11b47
[14] Environment Agency (2026) *Flood Map for Planning – Surface Water Spatial Planning Extents – Present Day.* https://environment.data.gov.uk/dataset/c853dc8c-9371-4a8f-99ea-a1daa023945e
[15] Anglian Water (2026) *327 - North East Lincolnshire Council.xlsx; 325 - North East Lincolnshire Council.xlsx*
[16] North East Lincolnshire Council (2026) *Draft Trajectory - Contractors 06.07.26 V3.xlsx*
[17] Anglian Water (2026) 20260616 N.Lincs DWF 2020-2025.xlsx
[18] Anglian Water (2026) WRC Catchment Boundaries.
[19] EA (2026) DWF Permits.
[20] EA (2026) *SIMCAT Model for River Trent. Trent_NPD_Datfile.*

In order to gain a deeper understanding of these three elements, as part of liaison with stakeholder's, key documents have been identified to supplement this water cycle study. These include water company resource management plans, drainage and wastewater management plans, river basin management plans and abstraction licensing strategies.

The scale and distribution of development in North East Lincolnshire has been determined through consultation with North East Lincolnshire Council and review of policy documents supporting the local plan. It includes the Local Plan's preferred site allocations, sites with existing planning permission, sites currently under construction and windfall development. This has been used to assess future borough wide pressures on water resources, wastewater infrastructure and water quality.

The results of these assessments have gone on to inform a site screening schedule which highlights the risks associated with each proposed development allocation. This considers water supply and wastewater infrastructure constraints, in addition to environmental constraints associated with water quality (WFD status) and other issues (designated sites and odour). Recommendations will be made with respect to the constraints identified, including the need for a project-level WFD assessment.

Commented [D2]: Comment to NELC- We have completed a large part of these assessments however we are awaiting on RAG data from Anglian Water to finalise.

A high-level review of the infrastructure upgrades required to support future development has also been provided to inform Local Plan policy.

2.3 Water Resources and Supply

Future water demand has been assessed against Anglian Water's latest Water Resources Management Plan published in 2025 (WRMP24). It sets out how it plans to provide a secure and sustainable supply of water for customers over the next 50 years (2025-2050), thereby incorporating the period being assessed in this study. North East Lincolnshire is located entirely within the Lincolnshire East Water Resources Zone (WRZ). The plan also considers the whole Anglian Water network, which is vital for putting development in the context of cumulative development across other functional catchment areas. Also considered are the impacts of climate change, the current and future supply and demand position, and potential resource options moving forward.

Anglian Water has been closely consulted throughout the development of this part of the study to confirm their understanding of the resource plan and identify any specific pressures in the study area. This has included the provision of Red, Amber and Green (RAG) reports on clean water capacity throughout the borough in view of the development being brought forward as part of the emerging local plan.

Commented [JL3]: These should be received by the end of August.

In the context of the assessment and liaison with Anglian Water, the potential for higher water efficiency standards have been considered within North East Lincolnshire. The study seeks to provide comment on the tighter standards being put forward in the government's latest review of water efficiency standards, identify exemplar standards that developers could aim for and considers standards for non-residential development.

Abstraction licences from the EA have been obtained and analysed for the borough. Subsequently, a high-level review has been undertaken, looking at the current abstraction strategy in North East Lincolnshire and the likely changes going forward.

Based on the findings of the above, the water cycle study report advises on future demand and resource management in the study area.

2.4 Wastewater Infrastructure, Water Quality and Environmental Capacity

2.4.1 Data Review

The water cycle study reviews the infrastructural capacity of the wastewater system and environmental capacity of the receiving water environment. This assessment has been undertaken in the context of the level of development identified and climate change.

In terms of infrastructural capacity relevant information from Anglian Water has first been obtained, including information on the major WRCs, DG5 sewer flooding records, and RAG reports on wastewater sewer capacity throughout North East Lincolnshire. This has enabled a high-level assessment of locations which are close to or at capacity, and where upgrades to manage future development may be necessary.

Commented [JL4]: Again, should be received by the end of August.

An initial review of environmental capacity has been undertaken using the EA's catchment data explorer. This has been used to find the current trends in ecological and chemical status for a number of watercourses in the study area, with a particular focus on those containing WRCs. The Humber River Basin Management Plan has been reviewed to identify the current measures in place to maintain water quality across North East Lincolnshire.

In the context of these findings and the future development proposals put forward, risk areas have been identified and high-level recommendations on potential measures to protect and where possible enhance water quality identified.

2.4.2 Headroom Assessments

To further assess infrastructural capacity as a result of development, a headroom capacity assessment has been undertaken at all WRCs that may be impacted by development proposed in the local plan. The assessment will determine whether the WRCs have sufficient headroom under current permits and capacity to process the predicted additional wastewater flows to 2043.

A total of four WRCs were identified as having the potential to be impacted by future local plan development in the borough. These include:

- Immingham WRC
- Laceby WRC
- Grimsby-Pyewipe WRC
- Tetney-Newton Marsh WRC

An assessment of whether these WRCs have sufficient headroom to manage the future development proposed over the lifespan of the Local Plan (2026-2043) was carried out using the following data sources:

- Measured Q80 and Q90 flow data supplied by Anglian Water for 2020-2025.
- WRC catchment extent data provided by Anglian Water.
- Development allocations in the emerging Local Plan, sites being brought forward from the adopted Local Plan, and undeveloped sites with planning permission provided by North East Lincolnshire Council. This included information on the number of residential dwellings and area of employment land expected for each year of the plan period.
- Estimates of windfall development over the plan period provided by North East Lincolnshire Council. These were provided for the whole borough and have been scaled down to each of the WRC catchments assessed.
- The current discharge permits in place at each WRC supplied by the EA, to extract the permitted DWF. These were cross checked with the EA before undertaking the assessments.

Although North Lincolnshire Council and East Lindsey District Council have been contacted regarding development in their borough, no response has been received. However, this is not expected to impact the conclusions of the assessment, as the area of the WRC catchments assessed located outside of North East Lincolnshire is very small, and as such limited growth is expected within them.

Commented [JL5]: We did not receive details about proposed development back from the neighbouring councils.

The EA typically use the Q80 flow (the flow exceeded for 80% of the time) when setting a DWF permit, provided there is confidence that it will not significantly deteriorate water quality in the receiving waterbody. However, for compliance purposes, the Q90 flow (the flow exceeded for 90% of the time) is also monitored by the water company and EA, as being a lower flow, it provides a greater certainty that the permitted DWF is exceeded. Both Q80 and Q90 flow scenarios were assessed, as it is important to understand how growth in the borough will impact both measurements of DWF.

Average Q80 and Q90 flows for the past five years (2021-2025) were determined for each WRC to provide a baseline value. To calculate the expected increase in flows, the number of development allocations draining to each WRC was first determined. Following this their expected increase in consumption was calculated considering the distribution of houses (household) and jobs (employment) at each site across the plan period.

Household consumption was calculated using the equation below:

Household Consumption = Dwellings × Occupancy Rate × Per Capita Consumption

As part of their WRMP, Anglian Water provide occupancy rates and per capita consumption figures for the Lincolnshire East WRZ. The 'final plan' average values across the plan period (2026-2043) have been used, these account for forecast changes in consumption as a result of planned demand measures. The occupancy rate was estimated to be 2.04 people per household (p/h), whilst the per capita consumption was estimated to be 124.34 litres per person per day (l/p/d).

In terms of the employment site allocations, a range of employment uses could come forward, each of which may result in different wastewater flows due to the number of employees required. For example, an office may have many more employees per hectare than a warehouse. Furthermore, some employment uses have additional water demands as part of their business operations. Nonetheless a reasonable estimate for wastewater received by WRCs from employment development may be obtained using the formula below:

Employment Consumption = No. Jobs × Per Capita Consumption

A per capita consumption rate of 50 l/p/d has been applied to employment land, this is based on estimates from South Staffs Water for office buildings[21] as no equivalent rate is provided within Anglian Water's WRMP. It is recognised that many employment sites within the Local Plan are allocated for manufacturing or industrial uses, however detailed water consumption data by employment type is not readily available. Importantly, the consumption rate adopted is significantly higher than typical benchmark figures for offices, for example Waterwise state a target figure of 15 l/p/d[22]. As these wastewater assessments relate to the water received by WRCs only, the adoption of 50 l/p/d for all employment sites is considered precautionary. It also provides a buffer to account for potential high-end industrial water users in the area.

[21] South Staffs Water. *Water Use In Your Business.* https://www.south-staffs-water.co.uk/media/1509/waterusebusiness.pdf
[22] Waterwise (2025) *The Waterwise Guide for Offices.* https://waterwise.org.uk/app/uploads/2025/02/The-Waterwise-Guide-for-Offices.pdf

Applying the equations above, the increase in consumption for each year of the plan period was cumulatively added to the baseline value to produce a forecast of Q80 and Q90 flows.

The assessment has assumed that 100% of domestic water used is returned to the sewer system. This is unlikely to be the case but guarantees that a precautionary approach is taken when assessing the capacity of the WRCs. Furthermore, when assessing WRC capacity, the permitted DWF was used as a substitute for actual designed hydraulic capacity. Whilst the permitted flows will relate well to the actual designed hydraulic capacity at some WRCs, in other cases it may not.

2.4.3 Water Quality Assessment

Following the completion of the headroom assessments at all major WRCs serving the borough, a screening assessment was undertaken at each WRC to compare its infrastructural capacity with the environmental capacity of the receiving waterbody. These screening assessments included the findings of the headroom assessments, the WFD status of the receiving waterbody, the Reasons for Not Achieving Good status, and any planned WRC upgrades or infrastructure improvement schemes. The results of this assessment highlighted where water quality modelling was required to further assess the impacts of proposed development.

The EA's SIMCAT model for the River Trent has been used to complete the water quality modelling. SIMCAT (Simulation of Catchments) is the EA's water quality river modelling software and is a crucial tool for reviewing discharge permits at a catchment scale and to quantify the source apportionment of both point and diffuse pollutant load within receiving surface waterbodies.

Water quality impacts to the receiving WFD waterbody have been measured against overall WFD status and the WFD status for individual elements. For this study, these elements include ammonia, Biochemical Oxygen Demand (BOD), orthophosphate, and total phosphorous.

The aims of the WFD[2] are to enhance the status and prevent further deterioration of surface water bodies, groundwater bodies, and their ecosystem. In this regard, the water quality modelling undertaken is used to assess the following criteria:

- Could the development cause a greater than 10% deterioration in water quality?
- Could the development cause a deterioration in WFD status for any element assessed?
- Could the development alone prevent the receiving watercourse from reaching Good Ecological Status (GES) when considering technically achievable limits (TAL)?

To achieve this, the first task was to review and run the Trent model to confirm it was fit for purpose. The model was run using SIMCATv15.7 and the default flows already in the model. The results from the model were collated for the relevant reaches and four determinants assessed for this study (BOD, ammonia, nitrate, orthophosphate and total phosphorous).

SIMCAT compares its modelled results to observed results recorded for flow and water quality at monitoring stations. The level of agreement between the modelled and observed results was used as a 'fit for purpose' test. It helps determine whether the model is appropriate for decision-making and identifies areas where uncertainty may affect the confidence of the resulting decisions.

Once the SIMCAT model was confirmed as fit for purpose, the technically achievable limits (TALs) proposed by the EA were reviewed. The EA advised that the permit values shown below are achievable using TALs, and that these values should be used for modelling all WRC potential capacity irrespective of the existing treatment technology and size of the works. It is important to note that TALs are not theoretical maximums, but rather the levels that can be consistently achieved in practice using standard wastewater treatment processes.

- Ammonia (95%-ile): 1mg/l
- BOD (95%-ile): 5mg/l
- Phosphorous (mean): 0.25mg/l

To review the appropriateness of the TALs involved comparing the existing effluent quality values (contained in the SIMCAT data files provided by the EA) to the TAL values.

Following this the model was run for a new baseline considering the averaged 2021-2025 Q80 values provided by Anglian Water. Only the Q80 is assessed as this ensures that a worst-case approach is taken when assessing impacts on the environment and improves the clarity of the water quality results presented. This baseline run assumed current wastewater treatment technology.

The model was subsequently run for a post-development scenario which considered increased flows due to development in the borough to 2043. The model was run considering current technology and then with TALs applied.

The results for ammonia, BOD, nitrate, orthophosphate and total phosphorous for the baseline runs were compared to the post-development results. The results were reviewed considering the environmental quality standards for ammonia and BOD, these relate to the 90th percentile. Note, for total phosphorous there are no universal environmental quality standards, instead the watercourse specific values for orthophosphate have been used. The standards are used to determine the impacts on WFD status and individual WFD elements.

Considering the environmental quality standards, along with the percentage deterioration, the three criteria were assessed. Table 1 summarises the standards for passing or failing each criterion. The water quality results are provided in section 5.

Table 1- Standards to assess WFD criteria

Score	Criteria
Green	No Infrastructure upgrade required to achieve.
Amber	Infrastructure upgrade required, but achievable using TALs or by addressing other factors preventing criteria being met.
Red	Cannot be achieved using TAL. Environmental capacity could be a constraint on growth.

2.5 Flood Risk

A high-level review of flood risk in North East Lincolnshire has been carried out focused on the potential impacts of future development.

An evaluation of the area's most sensitive to flood risk has been extrapolated to 2043 to consider the overall impact of the development proposed. This has used the EA national flood maps and DG5 records of sewer flooding. As well as accounting for the scale of development being brought forward within the borough, the impacts of climate change, local SuDS policy and urban creep have also been considered.

2.6 Other Environmental Constraints

Any other relevant environmental constraints have been identified through consultation with the council and the EA in the early stages of the project. This section principally covers protected sites and odour.

Within North East Lincolnshire, the Humber Estuary is designated as a Site of Special Scientific Interest (SSSI), Special Protection Area (SPA), Special Area of Conservation (SAC), and a RAMSAR site. The potential impacts of future development on the estuary have therefore are the focus of this section.

The location of WRCs in relation to developments is also discussed in the context of odour risk. Detail is provided on the steps required if sites are at reasonable risk of odour from treatment works, presently or in the future.

3 Baseline Assessment

3.1 Ground Levels, Geology and Land Use

Ground levels are significantly higher in the south of the borough (approximately 30 – 115 m AOD) than in the north and east (approximately 1 – 20 m AOD). The higher ground levels are associated with the hills of the Lincolnshire Wolds. The entire borough is underlain by chalk bedrock with superficial deposits predominantly consisting of till in the south and west of the borough, with tidal flat deposits in the east and north. The chalk bedrock is a classified as a principal aquifer.

Within the borough, the land further from the Humber Estuary in the west is predominantly rural, dominated by arable land. In the east of the borough, closer to the estuary, land use is more urbanised with the towns of Grimsby, Cleethorpes, and Immingham interspersed by industrial land uses along the coastline. Between some of these areas are suburban residential areas, including the villages of Waltham, Laceby, Healing, and Stallingborough, alongside areas of improved grassland.

3.2 Watercourses

The majority of watercourses within North East Lincolnshire are chalk streams which rise in the west within or close to the Lincolnshire Wolds, and outflow into the Humber Estuary in the east, see Figure 1. Significant artificial modification has occurred along many of these watercourses to reduce flood risk to surrounding areas, and to facilitate transportation and industrial uses. For example, the River Freshney originally outflowed to the Humber Estuary at Pyewipe but was rerouted to the southeast to serve the docks at Grimsby. As there is need to control levels and drainage in these areas, most of the watercourses within the borough are managed by an Internal Drainage Board (IDB). The North East Lindsey IDB manage the watercourses in the north and centre of the borough whilst the Lindsey Marsh IDB manage the watercourses in the south. Across the rural areas of the borough are many additional artificial drains and ponds.

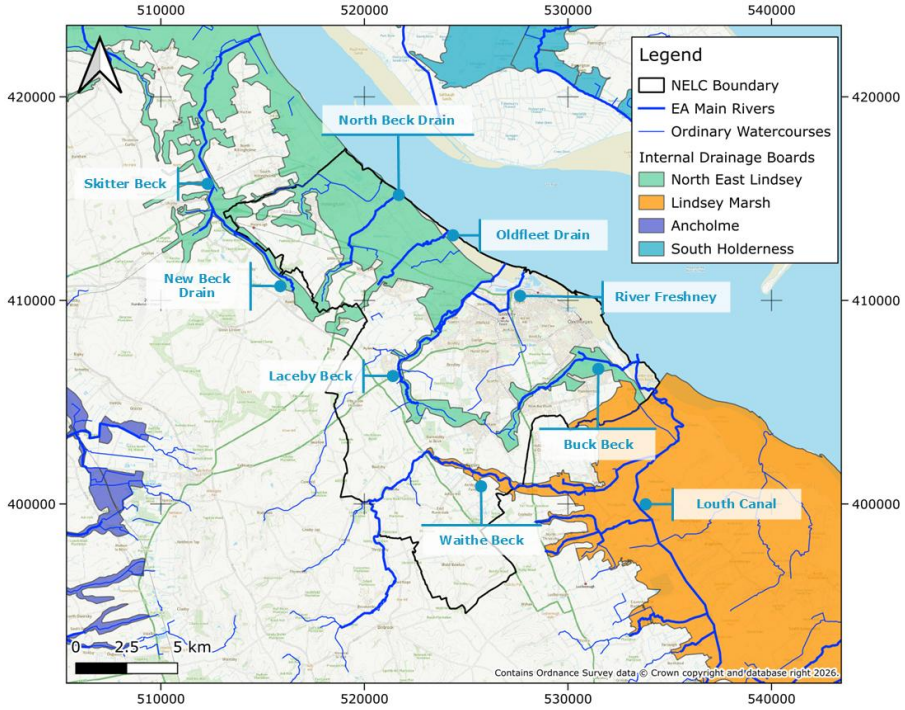

Figure 1 - Borough Boundary and Watercourses

3.3 Water Quality

North East Lincolnshire is located within the Louth Grimsby and Ancholme WFD Management Catchment, and the Becks Northern WFD Operational Catchment[9]. Ten River Water Body Catchments are located within the borough of which one classed as *Bad*, one is classed as *Poor*, and eight are classed as *Moderate*. The borough is also bordered by the Humber Lower Transitional Catchment (TraC) which has a classification of *Moderate*. One inland Coastal Catchment is also located marginally within the borough. This catchment is not directly attributed a WFD classification but drains directly to the Humber Lower TraC. The borough is fully underlain by the North Lincolnshire Chalk Unit WFD Groundwater Body which has an overall water body status of *Poor*.

Several Nitrate Vulnerable Zones are present across the borough including the Lincolnshire Chalk groundwater catchment and five surface water catchments[23]. In addition to this are several drinking water safeguard zones including the Louth Canal surface water zone in the south and several groundwater zones along the west of the borough.

[23] Environment Agency (2025) *Check for Drinking Water Safeguard Zones and NVZs.* https://environment.data.gov.uk/farmers/

3.4 Flood Risk and Drainage

Approximately 30% of land within the borough is located within Flood Zone 2 and 27% is located within Flood Zone 3a. Within the north and east of the borough this flood risk is associated with tidal flooding from the Humber Estuary whereas fluvial flood risk is the main flooding mechanism in the south and west of the borough.

Along the entire coast and many of the watercourses in the east/northeast of the borough are engineered flood defences including embankments, engineered high ground, flood gates, demountable defences, and flood walls. These significantly reduce the flood extents shown by the flood zones which are based on an undefended scenario.

The risk of flooding from surface water mapping shows surface water flood risk to be widespread across the lower lying areas of the borough in the east, north and centre. Within areas where ground levels are higher in the south and west of the borough respectively, surface water flood risk is mainly isolated to valleys in the topography and correlated with fluvial risk.

DG5 sewer flooding data from Anglian Water shows the greatest number of events to have occurred in Grimsby with clusters of events also occurring in Waltham, Laceby, Immingham, Healing, and Cleethorpes.

3.5 Climate and Water Availability

The EA has classified the area served by Anglian Water as being in "serious water stress"[24]. Serious water stress is defined in the Water Industry (Prescribed Conditions) Regulations 1999[25] as where *'the current household demand for water is a high proportion of the current effective rainfall which is available to meet that demand'.*

One Met Office climate station is located within the borough at Cleethorpes, Haverstoe Park. The average annual precipitation recorded at this station from 1991-2020 is 600 mm, significantly lower than the average for England (870 mm)[26]. Across the year, average monthly rainfall is >50mm from June to December and <50mm from February to May. November has the highest average rainfall (63.4 mm) whereas the lowest average monthly rainfall occurs in March (34.47 mm).

3.6 Designated Sites

Within North East Lincolnshire, the only SSSI designated for biological interests is the Humber Estuary. The Humber Estuary is a wetland of international importance designated under the Ramsar Convention. It is also designated as a Special Area of Conservation (SAC) and Special Protection Area (SPA). No other SACs or SPAs are located within or near to the borough.

Two SSSIs of biological interest are located near to the borough; Swallow Wold and Tetney Blow Wells. Both are located within WFD River Water Body catchments partially located within North East Lincolnshire.

[24] Environment Agency (2021) Water Stressed Areas - Final Classification 2021. Version 1.0: www.gov.uk/government/publications/water-stressed-areas-2021-classification
[25] UK Statutory Instruments (1999) *The Water Industry (Prescribed Conditions) Regulations 1999* https://www.legislation.gov.uk/uksi/1999/3442/contents/made
[26] Met Office (2026) *Location-specific long-term averages: Cleethorpes, Haverstoe Park.* https://www.metoffice.gov.uk/research/climate/maps-and-data/location-specific-long-term-averages/gcxbxk6cs

4 Future Development

The future development allocations within North East Lincolnshire, across the Local Plan period (2026-2043), are displayed within Figure 2. It includes the Local Plan's preferred site allocations, sites with existing planning permission and sites currently under construction.

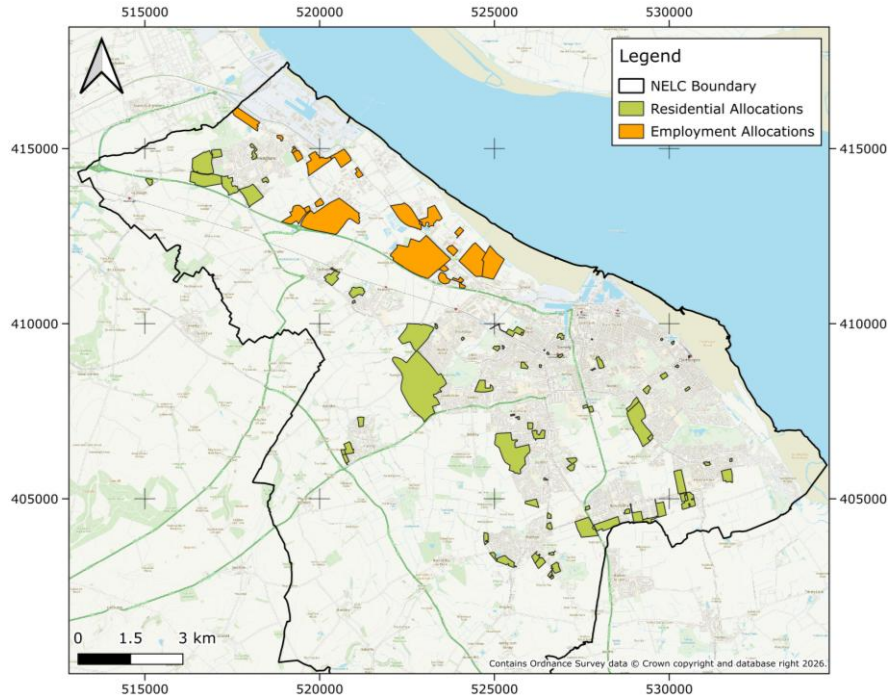

Figure 2 – Future Development Allocations

4.2 Residential

In total, the future development allocations will provide 11,791 dwellings, of which 7,621 are provided by the Local Plan preferred allocations. A further 3,180 dwellings are expected to be provided by developments currently under construction or with existing planning permission. The remaining 990 dwellings come from windfall development, this is expected to comprise an additional 1,800 dwellings offset by 810 demolitions.

Using the UK Government's new standard method for estimating housing targets, North East Lincolnshire have a housing delivery target of 621 dwellings per year, which totals 11,178 dwellings across the plan period. Therefore, the Local Plan option provides a further 613 dwellings above the council's required target.

Figure 2 shows the proposed residential site allocations are predominantly located in and around the current urban centres of Grimsby, Cleethorpes, Waltham, Laceby, and Immingham. No sites are identified within the Local Plan in the south/southwest of the borough.

4.3 Employment

Within the Local Plan allocations, there are 22 employment sites estimated to deliver 10,476 jobs across 356.5 ha. These sites are predominantly allocated for manufacturing and general business purposes; however, five sites are allocated for green energy, and one site is allocated for logistics and freeport. A further three sites are yet to be allocated a specific employment use. The proportion of jobs allocated to each industry is displayed in Figure 3. It shows that out of the 10,000 jobs created, over 75% of these are within manufacturing and general business.

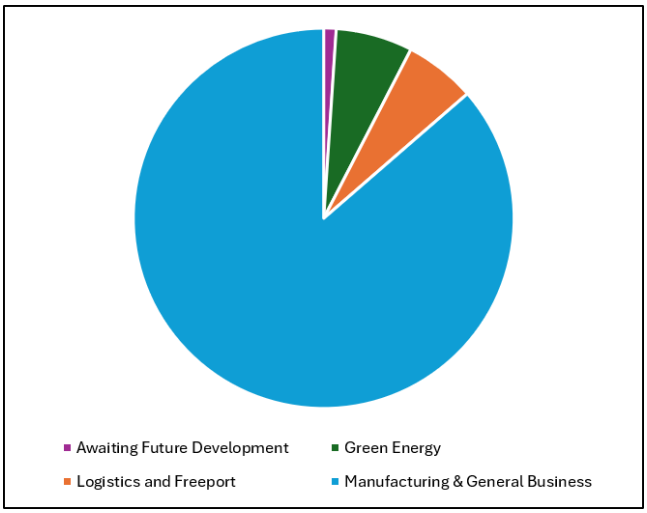

Figure 3 - Proportion of Jobs Allocated by Industry

As shown in Figure 2, all employment allocations are located in the north of the borough in and around the existing industrial and commercial developments between the A180 and the Humber Estuary.

5 Water Resources and Supply

This section first assesses the current water resources supplying North East Lincolnshire and subsequently reviews the supply-demand position moving forward against future development at the strategic level. This includes all development earmarked up to 2043. The assessment seeks to determine whether there will be enough water resources available to sustainably manage the projected development levels in the borough.

The existing abstraction licenses and license strategies across the borough are also reviewed. Recommendations are then made on future demand and resource management in the borough.

5.1 Water Company Planning

Anglian Water is responsible for water supply and wastewater collection and treatment across North East Lincolnshire.

Water companies in England, responsible for providing water supply as well as wastewater collection and treatment services, operate within five-year regulatory planning cycles.

These cycles are governed by Price Reviews, which establish the financial framework that determines how water companies operate and invest. Led by the Water Services Regulation Authority (Ofwat), each Price Review sets revenue allowances, performance commitments, and investment programmes for every water company in England.

The most recent Price Review, PR24, concluded in 2024 and established the funding available to water companies for the 2025–2030 period. This five-year period is known as an Asset Management Period (AMP), the 2025-2030 period specifically is termed AMP8. While the Price Review defines the regulatory and financial framework, an AMP is the operational period during which water companies deliver the commitments agreed through the price review.

It should be noted that, once funding has been obtained for upgrading and/or building new infrastructure, there remain significant lead times for planning and construction before infrastructure can be considered functional, see Table 2. In this respect the water companies require detailed information on likely housing and employment development well in advance.

Table 2 - Estimate of Lead in Times for Infrastructure for Anglian Water

Resource	Lead in Time
Sewage Treatment Work Upgrades	2-5 Years
Potable Water Transfers	3-5 Years
Water Reuse Schemes and Desalination	7-10 Years
New Reservoir	15+ Years

5.2 Water Resource Zones

North East Lincolnshire is located wholly within the Lincolnshire East WRZ, see Figure 4. The borough makes up only 7.2% of the total WRZ area, however it accounts for signfciantly more of its total population (see section 5.3). The WRZ covers 2,785 km^2 from the Humber Estuary in the north to the Wash in the south. The main urban areas within the WRZ include Grimsby, Cleethorpes, Louth, Skegness, and Boston.

The Lincolnshire East WRZ is predominantly supplied by groundwater abstractions from the Lincolnshire Chalk, Lincolnshire Limestone, and Spilsby Sandstone aquifers. A surface water

abstraction from the Louth Canal into the Covenham pumped storage reservoir also supplies the WRZ.

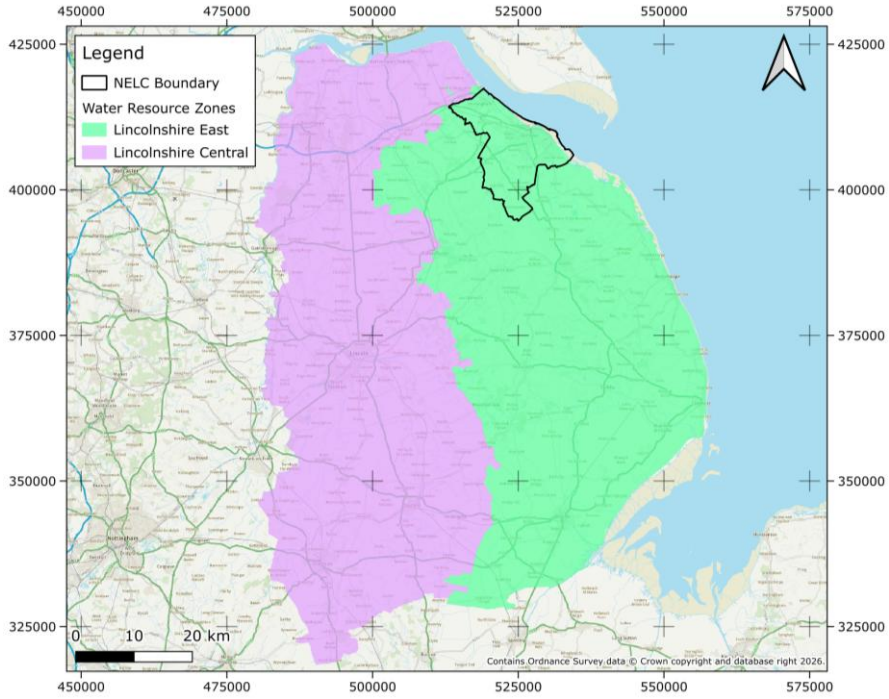

Figure 4 - Water Resource Zones

5.3 Population and Dwelling Forecast

Anglian Water have assessed the impact of forecast population, household growth and non-household growth on water resources as part of their WRMP24. They set out how they plan to provide a secure and sustainable supply of water for customers over the next 50 years (2025-2075).

5.3.1 Forecast Methodology

Population and dwelling forecasts are paramount in estimating future demand. Anglian Water, working with demographic analytics, calculated a range of population and dwelling growth forecasts across its supply area considering different growth scenarios. The population forecasts consider housing development, strategic growth, and demographic changes. The preferred population forecasts and dwelling figures are heavily based on local authority Local Plans and consider Office of National Statistics (ONS) trend-based projections. For the WRMP24, Anglian Water have selected a moderate growth scenario which includes a similar level of growth to the existing housing plan

projections for AMP8 but also includes additional strategic growth within the Oxford-Cambridge corridor in the southeast of their area[27].

Population and dwelling forecasts have been developed for each WRZ based on an aggregate of the findings for each local authority area. The values derived by Anglian Water are used to inform future demand, which is subsequently used in the determination of suitable resource options. Anglian Water's forecasts are compared to the development proposed in the local plan to determine if the development proposed could exceed what has currently been planned for, bringing unforeseen pressures on resources. To allow for this comparison the population and dwelling forecasts estimated by Anglian Water at the WRZ scale have been scaled down to North East Lincolnshire using available census data[28].

The WRMP24 states the population for the Lincolnshire East WRZ was 387,764 in the base year 2021/22. This is selected as the base year given that it is informed by real world 2021 census data and does not rely on extrapolation like the years since. The 2021 census data estimated there to be 156,900 living in North East Lincolnshire. Therefore, approximately 40.46% of the Lincolnshire East base population live within North East Lincolnshire using the best available data.

The WRMP24 states the base dwelling total (2021/22) for the Lincolnshire East WRZ to be 180,726. The live tables on dwelling stock[29] provided by the UK Government states the base dwelling total (2021/22) for North East Lincolnshire to be 74,488. Therefore, approximately 41.20% of the Lincolnshire East base dwelling total are located within North East Lincolnshire using the best available data.

5.3.2 Population and Dwelling Forecast

Table 3**Error! Reference source not found.** presents the population and dwelling figures provided within Anglian Water's WRMP24 for Lincolnshire East WRZ alongside scaled down values for North East Lincolnshire.

For the plan period start date of 2025/26, the WRMP24 shows the Lincolnshire East WRZ population to increase to 400,428. Using the same proportion of 40.46% as in the base year, the population of North East Lincolnshire is therefore estimated to be 162,024 at the start of the plan period. At the end of the plan period in 2042/43, the WRMP24 shows the Lincolnshire East WRZ population to be 428,607. Therefore, assuming the same proportion as before (40.46%) the estimated population for North East Lincolnshire in 2042/43 is 173,426. This translates to an increase of 11,402 across the plan period.

For the plan period start date of 2025/26, the WRMP24 shows the Lincolnshire East WRZ dwelling numbers to increase to 188,608. Using the same proportion of 41.20% as in the base year, the total number of dwellings within North East Lincolnshire is therefore estimated to be 77,737 at the start of the plan period. At the end of the plan period in 2042/43, the WRMP24 shows the Lincolnshire East WRZ dwelling total to be 210,132. Therefore, again assuming the same proportion as before (41.20%) the estimated dwelling numbers for North East Lincolnshire in 2042/43 is 86,608. This translates to an increase of 8,871 across the plan period.

[27] Anglian Water (2025) *WRMP24 Demand forecast.* https://www.anglianwater.co.uk/corporate/strategies-and-plans/water-resources-management-plan
[28] Office for National Statistics (2021) *2021 Census* https://www.nomisweb.co.uk/sources/census_2021
[29] Ministry of Housing, Communities and Local Government (2026) *Live tables on dwelling stock (including vacants).* https://www.gov.uk/government/statistical-data-sets/live-tables-on-dwelling-stock-including-vacants

Table 3- Base and Projected (2043) Population and Dwelling Estimates based on Anglian Water's WRMP

	Lincolnshire East WRZ	North East Lincolnshire
Plan Period Initial Population* (2025/26)	400,428	162,024
Projected Population (2042/43)	428,607	173,426
Plan Period Initial Dwellings (exl. voids) (2025/26)	188,608	77,737
Projected Dwellings (exl. voids) (2042/43)	210,132	86,608

Local Plan Housing Forecast

In the emerging local plan, 11,791 dwellings are planned to come forward. In comparison to Anglian Water's scaled down forecast (8,871 dwellings), this is an increase of 2,920 dwellings (33% increase).

One of the potential reasons for this difference is that the WRMP24 uses data which predates the UK Government's 2024 updates to the way in which housing targets are calculated. The new Standard Method requires local authorities to use standardised calculations based on housing stock which has led to a significant increase in housing requirements in many areas. North East Lincolnshire saw a significant increase in their local housing need target from 190 to 623 between the previous method and new standard method.

It is also important to note that the scaled-down figures based on Anglian Water's forecasts rely on assumptions of uniform population growth and stable occupancy rates across the WRZ. Furthermore, assessing North East Lincolnshire in isolation may not accurately reflect future water availability; local supply will inevitably be shaped by broader pressures within the Lincolnshire East WRZ and the wider Anglian Water network due to water transfers.

Despite this, the differences between the scaled down figures and the forecasted dwelling numbers being brought forward during the Local Plan are noteworthy. This is particularly important early in the plan period, given that the AMP8 cycle (2025-2030) is based on the WRMP24 plan-based forecasts.

5.4 Supply and Demand Forecast

5.4.1 Background

Supply

The raw volume of water that sources can reliably produce under specific legal and physical limits is termed the Deployable Output (DO). Water available for use (WAFU) is the actual net water left for supply after subtracting losses for climate change, planned and unplanned outages, sustainability reductions and water transfers to other companies. Note, in their WRMP, when estimating WAFU, the input DO values are estimated for a dry year.

Demand

Demand includes household use, non-household use, operational use (water used maintaining the network), water taken unbilled, leakage, and exports. The main driver on demand is population; however, several other factors also play a role, including the effects of climate change, improvements in efficiency, and changes in household/non-household consumption.

Anglian Water have estimated baseline and final plan demand forecasts for each WRZ. The baseline plans assume new demand management activity ceases at the end of AMP7 (2025) as per EA

guidelines. The measures introduced under AMP7 include the installation of meters, leakage reductions and household use reductions (due to public awareness and water efficiency savings). The Ml/d savings earmarked for these measures introduced under AMP7 will still have a continued effect, however additional measures introduced as part of AMP8 and beyond are not accounted for. The final demand forecast incorporates AMP8 measures and longer-term strategic plans.

Anglian Water's WRMP has assessed demand primarily using the Dry Year Annual Average (DYAA) forecast. The DYAA is the annual average value of water demand over the course of a dry year. Dry Year Critical Period (DYCP) forecasts have also been developed which describe the average daily demand during the peak week for water demand, rather than an annual average across the year. A shortfall in DYAA would suggest a longer-term water shortage across the year, whereas a shortfall in DYCP would suggest a water shortage when demand is high. This study focuses on the DYAA forecasts.

Household Consumption

To calculate household water demand, the sums of volumes of water used from various appliances are modelled and summed for individual activities, such as from toilet flushing, personal washing and clothes washing. The impacts of smart meters on consumption rates and leakage has been included in both the baseline and final plan forecasts.

Non-household consumption

The change in non-household consumption over time has been forecasted by Anglian Water through the development of regression models for each sector at the WRZ level. These models have been calibrated using employment numbers and Gross Value Added (GVA) data, alongside the population and property forecasts for the WRZ. Additional users including those switching from private to public supplies and new major users have also been considered within the forecast. For example, an additional 60 Ml/d is estimated to be required by the early 2030s to supply the South Humber Bank hydrogen production and carbon capture projects. However, this requirement is for non-potable water and so does not appear in the potable demand forecast.

Within the Lincolnshire East WRZ the largest user by sector is agriculture and manufacturing, contributing over 60% of the total WRZ non-household demand, see Figure 5. The second largest sector encompasses food and beverage processing, utilities, repairs and maintenance, and waste. This contributes to approximately 13% of the total WRZ non-household demand.

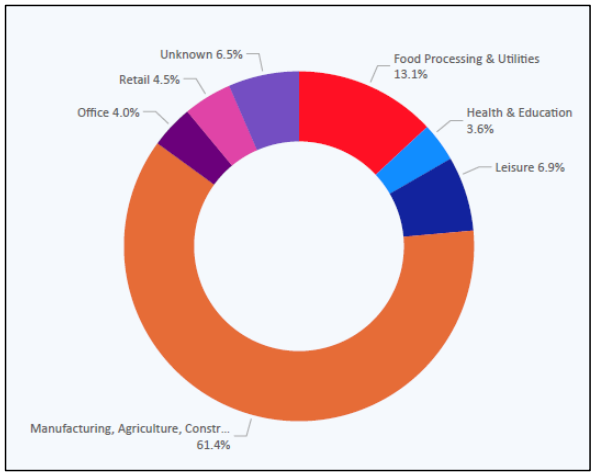

Figure 5 - Lincolnshire East WRZ Non-Household Sectors (Figure 12 in Anglian Water's WRMP24 Lincolnshire East WRZ Summary[5])

Supply-Demand Balance

Taking the WAFU and demand figures, Anglian Water have estimated a supply and demand balance. This takes the WAFU and demand figures above and adds a target headroom to the demand figures. Target Headroom is the minimum buffer water companies must maintain between WAFU and expected demand, serving as a safety margin to manage uncertainties like climate change, demand fluctuations, and supply shortages.

5.4.2 Baseline Forecast

Table 4 and Figure 6 provide a summary of the changes to the baseline DYAA demand, WAFU and the supply-demand balance for the Lincolnshire East WRZ across the local plan period.

Forecast DYAA demand is projected to increase primarily driven by population growth (a 6.6% increase across the plan period). Though per capita consumption is forecast to decline across the plan period due to AMP7 measures, from 136.5 l/p/d to 132.9 l/p/d, the increase in water efficiency does not fully offset population growth, resulting in a net increase in demand. Contributing factors to demand increases also include a 3.7% rise in non-household consumption from employment growth, minimal reductions in leakages within the network, and a slight increase in the volume of water exported from the WRZ.

As demand increases, WAFU is forecast to fall driven by required reductions to the deployable output to restore sustainable abstraction levels for "Environmental Destination" targets set by the Environment Agency, see Table 4. These targets specify where and by how much both surface water and groundwater abstractions need to reduce to achieve and maintain a healthy water environment[30].

[30] Environment Agency (2025) *Principles for protecting the water environment in water resources planning. Using Environmental Destination for Water Resources to plan for environmentally sustainable abstraction.*

The overall supply-demand balance at the start of the plan period shows supply and demand are balanced when the target headroom is taken into account. At the end of the plan period, there is a deficit of 32.5 Ml/d, see Table 4.

Table 4 - Baseline Plan Supply-Demand Forecast for Lincolnshire East WRZ (2025-2043)

Metric	Forecast DYAA Demand (Ml/d)		Forecast WAFU (Ml/d)		Forecast Supply-Demand* (Ml/d)	
Year	2025/26	2042/43	2025/26	2042/43	2025/26	2042/43
Ml/d	110.47	113.76	116.64	87.54	0.00	-32.50
% Change	+2.98%		-24.97%		N/A	

*including target headroom allowance.

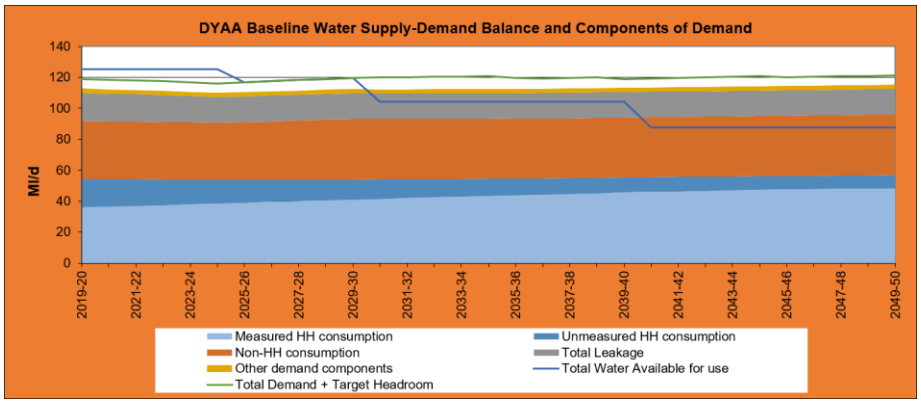

Figure 6 - Baseline Water Supply-Demand Balance (Lincolnshire East WRZ)

5.4.3 Final Plan Forecast

The final demand forecast for Anglian Water's Lincolnshire East WRZ incorporates AMP8 measures and measures beyond 2030 in order to reduce demand and increase supplies. The key measures are outlined below with more detail provided in the subsequent sections on the specific demand and supply options identified.

- Demand management including reducing leakage, installing smart meters and assisting people and businesses to use less water.
- Enhancements to groundwater and surface water abstractions.
- Ingoldmells to Covenham via River Eau, water reuse.
- Lincolnshire East WTW backwash water recovery.
- Mablethorpe desalinisation.

Table 5 and Figure 7 provide a summary of the changes to the final plan DYAA demand, WAFU and the supply-demand balance for the Lincolnshire East WRZ across the local plan period.

Forecast DYAA demand is projected to decrease with water efficiency measures and reductions in leakage reducing both household and non-household consumption compared to the baseline. The

reduction in consumption offsets increases in demand due to population growth and new employment sites.

WAFU reduces from 117.25 Ml/d to 105.97 Ml/d over the plan period. However, this reduction is less pronounced than in the baseline forecast, with WAFU remaining above forecast demand, as shown in Table 5. This is primarily due to additional supply sources coming online, which offset some of the reduction in WAFU arising from environmental destination targets, climate change and exports to other WRZs. Notably, exports increase in the final plan, likely due to additional supply sources coming forward in the Lincolnshire East WRZ, which are able to serve other WRZs within the Anglian Water supply network.

Over the plan period, the overall supply-demand balance reduces slightly but remains above the target headroom with no deficit forecast.

Table 5 – Final Plan Forecast for Lincolnshire East WRZ (2025-2043)

Metric	Forecast DYAA Demand (Ml/d)		Forecast WAFU (Ml/d)		Forecast Supply-Demand * (Ml/d)	
Year	2025/26	2042/43	2025/26	2042/43	2025/26	2042/43
Ml/d	109.69	98.39	117.25	105.97	1.39	1.30
% Change	-10.29%		-9.62%		-6.47%	

*including target headroom allowance.

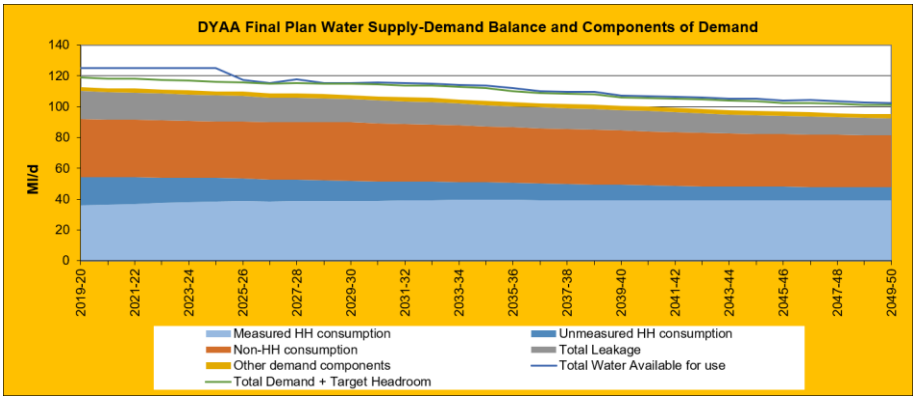

Figure 7 - Final Plan Supply-Demand Balance (Lincolnshire East WRZ)

5.5 Demand Management

This section goes into more detail on the specific demand management options earmarked by Anglian Water in their final plan. In developing this plan, Anglian Water have taken into account three main components of water demand:

- Household (HH) Consumption: water consumed by households
- Non-Household (NHH) Consumption: water consumed by businesses
- Leakage: water that leaks from water mains and customer supply pipes

In relation to these the WRMP has identified four main areas of investment in order to reduce demand and ensure water-supplies continue to be sustainable in the future.

Smart Metering (Household and Non-household)

Anglian Water aim to complete their roll out of smart meters by 2029/30 with a feasible limit for smart meter uptake of 95.2%. By 2049/50, they estimate smart meters to save a total of 30.4 Ml/d through increased water efficiency from behavioural changes and plumbing loss reductions through improved detection of property leakages. The use of smart meters should support the targets for improved household and non-household water efficiency.

Household Water Efficiency

Anglian Water aims to encourage reduced household water use to meet the National Framework per capita target of 110l/d by 2049/50 through the provision of smart water devices/sensors and meters to allow residents to understand their water usage. Additional community campaigns also aim to encourage lower usage.

Non-Household Water Efficiency

Similarly to household water efficiency, the installation of smart meters by Anglian Water aims to reduce non-household consumption through the identification of leaks and improvements in efficiency. Furthermore, for medium and large users, smart meters may be used to identify where targeted "water audit visits" could be used to reduce usage. Within their WRMP24, Anglian Water estimate these measures to reduce non-household water consumption by 50 Ml/d by 2049/50.

Since the publication of the WRMP24, Anglian Water are also considering the use of water recycling and water efficiency incentives. For their largest users (>25 Ml/yr) Anglian Water are trialling efficiency tariffs, where an audit is carried out to highlight what a business could do to improve water efficiency, with financial incentives provided for implementing mitigation measures. Closer collaboration with customers, retailers, and regional groups has also been identified as a key tool to understand local water requirements and issues.

Leakage

Anglian Water have targeted a 30% reduction in leakage across their network by 2049/50, reducing their overall leakage volume to 134.5 Ml/d. Methods to achieve the targeted 56.79 Ml/d reduction in leakage volume include pressure management, fixed acoustic logging, water main replacement, and smart metering. Most of the work to reduce leakage will be carried out within AMP9 and beyond (post 2030), where improvements to remote sensing and fixed loggers are hoped to reduce the estimated costs.

5.6 Resource Supply Options

While demand reduction is the priority, Anglian recognises that population growth, climate change, and environmental constraints will require additional water sources to maintain long-term supply resilience.

Within the Lincolnshire East WRZ specifically, Anglian Water have developed a summary document[5] which highlights their preferred supply side options. Additional detail and a list of all feasible options is provided in their Supply-side Option Development technical document[31].

[31] Anglian Water (2025) *WRMP24 Technical Document. Supply-side option development.*

Lincolnshire East WTW Backwash Water Recovery

Backwash water recovery increases the volume of potable water produced by a WTW by rerouting the non-potable water used to clean the sand beds at a WTW back through the treatment system rather than discharging it to the environment. Anglian Water estimate this option could provide an additional 1.3 Ml/d of WAFU.

Mablethorpe Desalination Seawater

Desalination of seawater is the conversion of saltwater to freshwater and its subsequent treatment to produce potable water. The Mablethorpe site is proposed to be located offshore. Figure 8 provides a simplified description of the offshore desalination process. Anglian Water estimate this option could provide an additional 50Ml/d of WAFU, with the option for an additional 60 Ml/d of non-potable water, though this would be exported to the South Humber Bank WRZ to support the development of hydrogen industries.

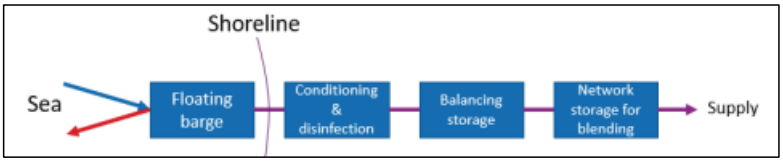

Figure 8 - Offshore Desalination Process (Figure 13 of Supply-side option development[31])

Lincolnshire East Groundwater Enhancement

Enhancements are proposed at Healing and Little London abstraction points. At Healing, improvements to the existing borehole assets are proposed, whilst at Little London ion exchange nitrate removal is proposed. Anglian Water estimate this option could provide an additional 7.5 Ml/d of WAFU.

Lincolnshire East Surface Water Enhancement

The surface water enhancements are focused upon increasing the treatment capacity at Covenham WTW through enhanced abstraction from the River Great Eau and Louth Canal into the Covenham Reservoir. Anglian Water estimate this option could provide an additional 7.3 Ml/d of WAFU with a delivery date of 2030.

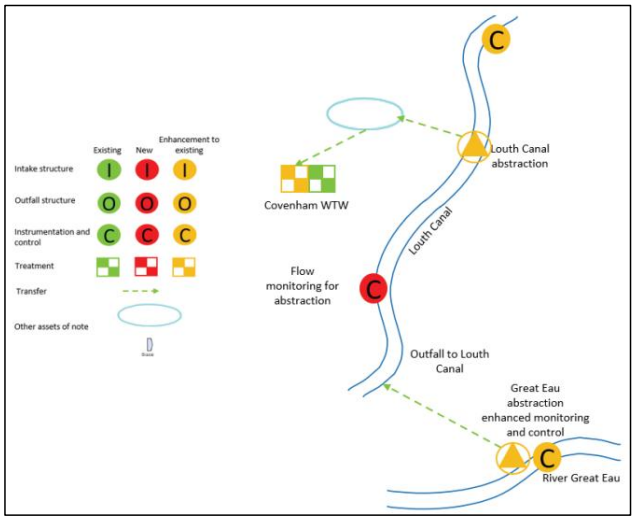

Figure 9 - Lincolnshire East Surface Water Enhancement (Figure 49 of Supply-side option development[31])

5.7 Site Allocation Water Supply RAG Reports

Commented [JL6]: These should be supplied by Anglian Water by the end of August.

5.8 Water Efficiency

The National Framework for Water Resources[32] per capita water use target is 110l/d by 2050. Anglian Water state that government-led interventions are required alongside their smart metering and water efficiency programs to meet this target.

For new build dwellings and conversions, a water efficiency calculation is a legal requirement set out in Part G of the Building Regulations. It requires that a dwelling must not use more than 125 l/p/d. However, the Planning Practice Guidance (PPG)[33] states that where there is a clear local need, local planning authorities can set out Local Plan policies requiring new dwellings to meet the tighter building Regulations optional requirement of 110 l/p/d. The current North East Lincolnshire Local Plan[34], adopted in 2018, mandates the 110 l/p/d standard through policy 34.

In September 2025, the UK Government consulted[35] on lowering the baseline mandatory efficiency standard to all new homes from 125 l/p/d to 105 l/p/d and lowering the optional standard from 110 l/p/d to 100 l/p/d. While not yet implemented, these changes could take effect in 2026. The consultation also included a call for evidence on whether the government should pursue tightening

[32] EA (2020) *Meeting our future water needs: a national framework for water resources* https://www.gov.uk/government/publications/meeting-our-future-water-needs-a-national-framework-for-water-resources
[33] Department for Levelling Up, Housing and Communities (2015) *Housing: optional technical standards* https://www.gov.uk/guidance/housing-optional-technical-standards
[34] North East Lincolnshire Council (2018) *Local Plan 2013 to 2032 (Adopted 2018).*
[35] DEFRA (2025) *Review of Water Efficiency Standards in the Building Regulations 2010* https://consult.defra.gov.uk/water-efficiency-demand/review-of-water-efficiency-standards/

mandatory standards to 95-100 l/p/d and optional standards to 80-90 l/p/d. The evidence gathering focused on the feasibility of mandating reuse systems through the Building Regulations, including rainwater harvesting, greywater harvesting, and black water harvesting systems.

Aligning with this, the Environmental Improvement Plan 2025[36] states that water efficiency, water recycling, and drainage standards should be reviewed regularly to determine whether they need strengthening, including exploring opportunities to meet the standard such as technological innovation to increase water-efficient housing.

Given the issues of water stress several public and private bodies have further investigated the potential for tighter standards. In response to the EA's National Framework for Water Resources, the UK Government are developing a roadmap towards greater water efficiency in new developments and retrofits. The Future Homes Hub has published a report[37] to input into the roadmap which highlights the need for changes in future per capita consumption (PCC) standards, fittings, labelling, water reuse, and water positivity to enable sustainable growth. It has reviewed foreseeable changes in fittings and technology to set out a roadmap for future PCC standards between 2025-2035. These are shown in Table 6, with different standards set depending on levels of water stress.

Table 6- Future Homes Hub l/p/d framework

Demand Programme	2025	2030	2035
Achieved through fittings approach	105 l/p/d	100 l/p/d	90 l/p/d
In water stressed areas	100 l/p/d	90 l/p/d	80 l/p/d
In seriously water stressed areas	90 l/p/d	To be determined	To be determined

The Royal Institute of British Architects (RIBA) has also developed voluntary performance targets for water use in construction[38], in consultation with other professional UK construction bodies. For water efficiency, it sets a standard of 95 l/p/d by 2025 and 75 l/p/d by 2030. The overall performance targets, including water efficiency, are required to realistically achieve net zero carbon for the whole UK building stock by 2050.

The Building Research Establishment Environmental Assessment Method (BREEAM)[39] does not set specific standards for PCC, however, it does set graded standards for individual water fittings which developers can use to reduce water consumption as well as certification for non-household buildings.

It is recommended that the council consider a policy on water efficient design, looking at reaching higher levels of water efficiency for new development beyond the 110 l/p/d set in the adopted Local Plan and below 100 l/p/d if possible. This will help mitigate water resource challenges early in the plan period and, alongside new supply sources, reduce the risk of additional pressures in the future.

[36] DEFRA (2025) *Environmental Improvement Plan (EIP) 2025.* https://www.gov.uk/government/publications/environmental-improvement-plan-2025/environmental-improvement-plan-eip-2025
[37] Future Homes Hub (2024) *Water Ready- A report to inform HM Government's roadmap for water efficient new homes* https://irp.cdnwebsite.com/bdbb2d99/files/uploaded/Water%20Ready_A%20report%20to%20inform%20HM%20Government-s%20roadmap%20for%20water%20efficient%20new%20homes.pdf
[38] RIBA (2021) *RIBA 2030 Climate Challenge* https://www.architecture.com/-/media/files/Climate-action/RIBA-2030-Climate-Challenge.pdf?srsltid=AfmBOopW1CKKCWUCJ76wMu2194M2EVKmfsT9sCZT-NoSvN8rClGvzGv1
[39] BREEAM (2026) *BREEAM Standards* https://breeam.com/standards

For non-household development, it is recommended that local plan policy requires a minimum of 3 credits under the BREEAM New Construction Standard measure "Wat01".

Reducing PCC to tighter standards across the borough will likely require the demand reduction actions outlined by Anglian Water in combination with government led policy changes. This should help make water efficiency savings more financially viable for developers. Overall, tighter water efficiency requirements in the Local Plan will support the balance of water supply against demand. As mentioned, this is especially important early in the plan period as additional supply options are being developed.

5.9 Abstraction Licences

A data request was sent to the EA to establish the existing water abstraction licences in North East Lincolnshire. The data indicates 31 licences are in use within the borough across 17 licence holders (see Table 7). The total number of abstraction points is 102 as most licences allow for multiple abstraction points. Figure 10 maps these points, it shows most agricultural abstractions are located in the south of the borough, whilst industrial uses are more prevalent in the north close to the Humber Estuary.

Of the total annual volume of licensed water abstractions (40,819,709 m^3), 69% is used for water supply, 28% is used for industrial, commercial, and public services, 3% is used for environmental purposes, and 0.3% is used for agriculture.

Table 7 - Abstraction Licence Details

Licence Holder	Industry	Use	Source Type*	Total Max Daily Abstractions (m^3)	Total Annual Abstractions (m^3)	No. Abstraction Licenses
Anglian Water	Public Water Supply	Potable Water Supply - Direct	GW	118,876	27,107,061	6
	Remedial River/Wetland Support	Transfer Between Sources (Post Water Act 2003)	GW	1,900	693,500	1
Associated British Ports	Chemicals	Non-Evaporative Cooling	GW	13,360	1,750,000	1
	Food & Drink	Process Water	GW	90	20,000	1
	Private Water Undertaking	General Use Relating To Secondary Category (Medium Loss)	GW	1,920	600,000	1
Fenwick Bros Ltd	General Agriculture	Spray Irrigation - Direct	SW	546	45,461	1
	General Agriculture	Spray Irrigation - Storage	SW	2,000	72,000	1
Grimsby Golf Club	Golf Courses	Spray Irrigation - Direct	SW	140	5,000	1
Humber Industrials Ltd	Other Industrial/Commercial/Public Services	Evaporative Cooling	GW	4,111	1,500,000	1
Immingham Storage Co Ltd	Petrochemicals	General Washing/Process Washing	TW	6,546	104,560	1
J And A Young (Leicester) Limited	Food & Drink	Process Water	GW	5,700	454,454	1
J G Fisher Ltd	General Agriculture	Spray Irrigation - Direct	SW	909	18,411	1
Livestock Feeds (Grimsby) Ltd	Industrial/Commercial/Energy/Public Services	Make-Up Or Top Up Water	SW	23	8,400	1
M F Strawson Ltd	Golf Courses	Spray Irrigation - Direct	SW	100	9,091	1
North East Lincolnshire Council	Industrial/Commercial/Energy/Public Services	Make-Up Or Top Up Water	GW	1,718	42,728	2
	Non-Remedial River/Wetland Support	Transfer Between Sources (Post Water Act 2003)	TW	3,576	65,000	1
	Other Environmental Improvements	Wet Fencing And Nature Conservation	SW	5,040	80,000	1
	Non-Remedial River/Wetland Support	Make-Up Or Top Up Water	SW	2,160	240,000	1
Northern Lincolnshire & Goole Hospitals NHS Trust	Private Water Undertaking	Raw Water Supply	GW	1,050	270,000	1
Pelagia (UK) Limited	Food & Drink	Process Water	GW	5,133	550,000	1
Shell UK Oil Products Limited	Pump & Treat	Pollution Remediation	GW	300	109,500	1
Tronox Pigment UK Limited	Chemicals	Process Water	GW	20619	6701718	2
Trustees Of Roger Burnett Promotions & Death Benefits Scheme	Golf Courses	Spray Irrigation - Storage	SW	500	9,000	1
Young's Bluecrest Seafoods Ltd	Food & Drink	Process Water	GW	2,272	363,825	1
Total				**198,589**	**40,819,709**	**31**

*GW = groundwater, SW = surface water, TW = transitional water

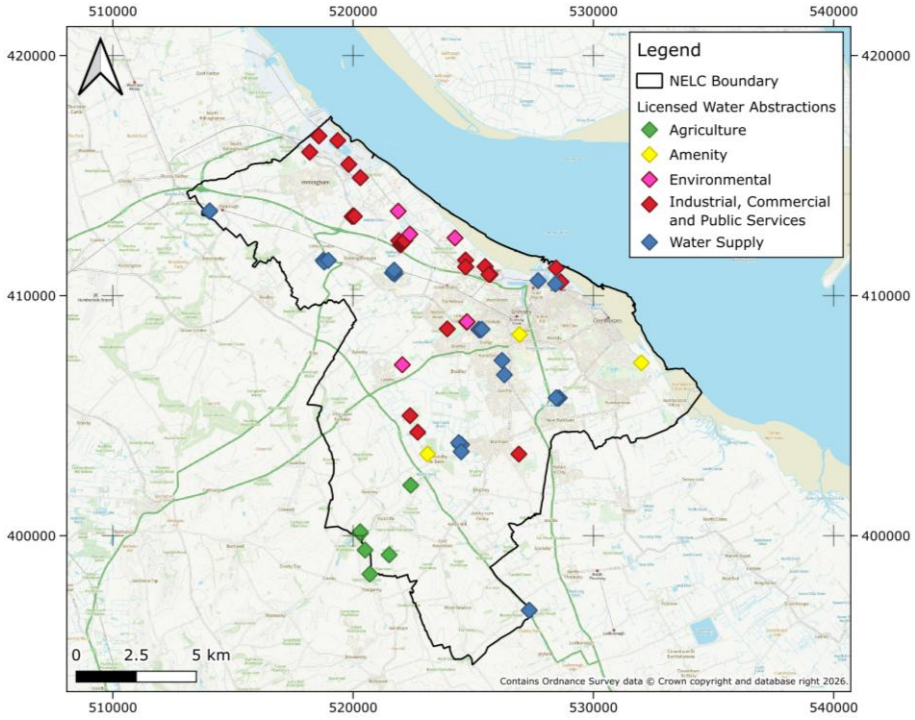

Figure 10 - Licensed Water Abstractions

Based on the Grimsby, Ancholme and Louth abstraction licensing strategy[11], the majority of WFD waterbodies within the borough are classed as 'water not available for licensing' for all flows up to the Q30 flow. An exception to this is the Waithe Beck Lower Catchment (to Tetney Lock), and Buck Beck from Source to N Sea WFD waterbodies in the south of the borough, which are classed as 'restricted water available for licensing' for the Q30 flow but 'water not available' for the Q50 flow and below. Similarly, the Lincolnshire Chalk and Spilsby Sandstone groundwater body which underlies the borough is classed as 'water not available for licensing' as more water has been abstracted than the amount available. This assessment is based on the groundwater unit balance rather than specific flows.

The EA will not grant any further licences within areas classed as 'water not available for licensing'. Where waterbodies are classed as 'restricted water available for licensing' no new consumptive licences will be granted by the EA, however water may be available through licence trading with existing licence holders.

Overall, the Grimsby, Ancholme and Louth abstraction licensing strategy suggests there is limited water availability within the borough from both surface water and groundwater sources. Therefore, there will be restriction on new water uses from all sources.

5.10 Summary

Without provisions to increase supply and reduce demand, the Lincolnshire East WRZ is expected to have a shortfall of 32.50 Ml/day at the end of the plan period. However, when considering Anglian Water's final WRMP 2024 plan, the WRZ should have a small surplus whilst also increasing the volume it exports to areas experiencing greater water stress.

However, it should be noted that the level of growth proposed within the North East Lincolnshire Local Plan is approximately 33% greater than the estimate within Anglian Water's current WRMP. Without corrective action, this has the potential to increase the probability of shortfalls in water supply during dry periods.

The risk is greatest early in the plan period before publication of the next WRMP scheduled for 2029. The WRMP 2029 should factor in the additional growth proposed in North East Lincolnshire and the latest growth figures from other areas within Anglian Water's supply area.

The current WRMP has identified demand management through a combination of leakage reduction, smart metering and the promotion of water efficiency as the best means to negate a water deficit in the short to medium term. This should be sufficient to offset the potential deficits from increased development; however Anglian Water have also identified supply side options to increase the WAFU. These options include desalination, backwash recovery, and abstraction enhancements. There is likely to be significant lead in times to these options, especially for desalination and water reuse schemes.

Therefore, tighter water efficiency standards for new household and non-household properties will play an important role in the early part of the plan period, in ensuring the WRZ supply-demand balance is managed. The need for tighter standards is further heightened by the level of growth proposed in the Local Plan, which as mentioned exceeds the growth forecast in WRMP24.

Water availability in North East Lincolnshire will depend on development and climate pressures not only in the borough but across the wider Anglian Water supply area. It will also be influenced by the implementation of the WRMP.

The assessment undertaken provides an understanding of water resource pressures in the borough in the context of future development and climate change. However, it is important to note that the findings are caveated on the basis of several assumptions. The main evidence gaps are identified as:

- Whether the demand and supply changes forecasted for the Lincolnshire East WRZ fully translate to North East Lincolnshire as it makes up only 7.2% of the total WRZ area and 40.5% of the total population.
- The specific effects of the developments proposed in the Local Plan on the water supply network.

Commented [JL7]: This may be answered by the RAG reports from Anglian Water.

To provide more confidence in the assessment and fill the evidence gaps identified, further technical work would be required to refine population estimates and derive specific deficits for North East Lincolnshire, considering the quantum of development proposed in the upcoming Local Plan. In supplying water to the whole of North East Lincolnshire, Anglian Water are best placed to assess the impact of these population changes on supply and demand, which will require an in-depth understanding of how its WRZs operate, and access to the models used in development of the WRMP. The deliverability of upgrades to the water network would also require further technical input from Anglian Water as sites are brought forward through the planning process.

To further strengthen the long-term management of water resources throughout the plan period, the following stakeholder actions and recommendations have been identified:

- Anglian Water will continue its responsibilities in upgrading and providing water supply for new developments without presenting a risk to the environment.
- Anglian Water will need to assess future development earmarked in the Local Plan when developing their upcoming WRMP2029.
- The EA will need to review and provide feedback on Anglian water's WRMP2029, ensuring that Anglian water address future water needs and provide a secure and sustainable water supply to the borough.
- The EA will continue to regulate the abstraction of water from rivers and other sources in the borough, ensuring it is sustainable and within legal limits.
- It is recommended that developers engage with Anglian water as early as possible so they can undertake modelled impact assessments to confirm if specific water supply upgrades are required and when. This is particularly the case for developers of heavy water use industries attracted by the Humber Estuary.
- Should strategic infrastructure upgrades be required to supply new development, the option to phase some of the dwellings to later in the plan period should be considered, especially for larger scale residential developments.
- It is recommended that the council consider a policy on water efficient design, looking at reaching higher levels of water efficiency for new development beyond the 110 l/p/d currently implemented and potentially below 100 l/p/d. This will help mitigate water resource challenges early in the plan period and, alongside new supply sources, reduce the risk of additional pressures in the future.
- For non-household development, it is recommended that local plan policy requires a minimum of 3 credits under the BREEAM New Construction Standard measure "Wat01".
- New non-household users should also engage with Anglian Water and retailers at the planning stage to ensure sufficient water supply is available to facilitate the proposed development.
- The council will provide Anglian Water with their Annual Monitoring Reports and Housing Land Supply Statements, which outline projected housing development within their administrative area.

6 Wastewater Infrastructure, Water Quality and Environmental Capacity

This section assesses the infrastructural capacity of the wastewater system and environmental capacity of the receiving water environment. The infrastructural capacity is defined as the ability of the wastewater system to collect, transfer and treat wastewater from homes and businesses. The environmental capacity is defined as the water quality needed to protect aquatic wildlife and the environment. The latter is associated with the water quality targets required to protect waterbodies and the associated WRC and storm discharge environmental permits in place to achieve this.

The study begins with a review of existing literature and available data for both aspects, followed by detailed assessments. These include headroom assessments and where required water quality modelling to further assess infrastructural and environmental capacity. Each of these assessments consider the proposed development within North East Lincolnshire over the plan period (2026–2043), with the aim of determining whether there will be any detrimental impact on water quality and whether additional wastewater infrastructure will be required.

6.1 Review of Infrastructural Capacity

6.1.1 Drainage and Wastewater Management Plan

Water and sewerage companies must produce Drainage and Wastewater Management Plans (DWMPs) looking at current and future capacity covering a minimum of 25 years. Pressures, and risks to their networks from climate change and population growth need to be considered. DWMPs must detail how companies will manage these pressures and risks through their business plans and how they will work with other risk management authorities and/or drainage asset owners. The DWMP process is iterative and is repeated every 5 years, with the next version due in 2028.

Anglian Water have identified the following three main themes as the focus for their DWMP[6]:

- Escape from sewers – measured using risk of flooding from 1 in 50-year storm, storm overflow performance, external and internal sewer flood risk and pollution risk, and sewer collapse.
- WRC Compliance – measured through DWF compliance and effluent quality compliance.
- Environmental and wellbeing – measured through access to amenity areas, and green infrastructure.

Across the whole of the Anglian Water area there are over 1100 WRC catchments. Of these, 600 have been identified as potential risk catchments due to planned growth or climate change. The DWMP's initial risk-based screening identified 300 WRC catchments with risks, as measured by the above parameters, when considering growth and climate change up to 2035. These are defined as medium term catchments where investments would be made between 2025 and 2035. A further 63 WRC catchments were identified as low risk in 2035 but higher risk by 2050. A longer-term strategy for investments would be made at these catchments. Finally, 218 catchments required further investigation from the initial screening process but were identified as low risk in 2050. Therefore, monitoring will continue throughout further DWMPs.

Within the screening process, several stakeholders were engaged to help identify specific concerns for each WRC catchment. These stakeholders included:

- All county and district councils
- Lead Local Flood Authorities
- Environment Agency
- Internal Drainage Boards

- River and Wildlife Trusts
- Natural England
- Ofwat
- Local river and environmental groups

6.1.2 Water Recycling Centres (WRCs)

Discharges from WRCs are controlled by discharge consents set by the EA, which detail the flow rate and effluent quality that the WRC must meet to achieve water quality targets. The Dry Weather Flow (DWF) is a key parameter in this regard. It is the flow that may be discharged during dry weather, in the absence of any additional flows from rainwater or snow melt. The DWF permit specifies the allowable discharge flow rate and required effluent quality of the flow.

The flow to full treatment (FFT) is also important as it measures how much wastewater a treatment works is able to treat at any given time. Where the FFT level is exceeded, water may need to be diverted to storm tanks where available. Water will typically be held in these tanks until the storm passes, before being returned to the front of the works to be treated.

Where a storm is prolonged or sustained, the WRC's environmental permit often allows the water company to release the extra incoming rainwater and diluted wastewater into the environment, usually following partial treatment. If a water company diverts this rain and wastewater to storm tanks or the environment before reaching the works' FFT level, they could be breaking the conditions of their environmental permit.

Population growth has the potential to increase effluent flows from WRCs above their consented flows, therefore increasing the risk of failing to meet water quality objectives. To mitigate against this, the treatment capacity at WRCs may need to be increased and/or the treatment technologies may need to be improved. The existing DWF permit may also need to be renegotiated.

Five WRCs have been identified that have catchments located at least partially within North East Lincolnshire, see Figure 11. The identified issues and proposed investments by Anglian Water for each catchment are summarised below, as well as the predicted trends in population growth based on Local Plan growth figures and Office for National Statistics (ONS) forecasts[40].

[40] Anglian Water (2023) *Level 3 Summary.* https://www.anglianwater.co.uk/corporate/strategies-and-plans/drainage-wastewater-management-plan/draft-plan/level-3-summary

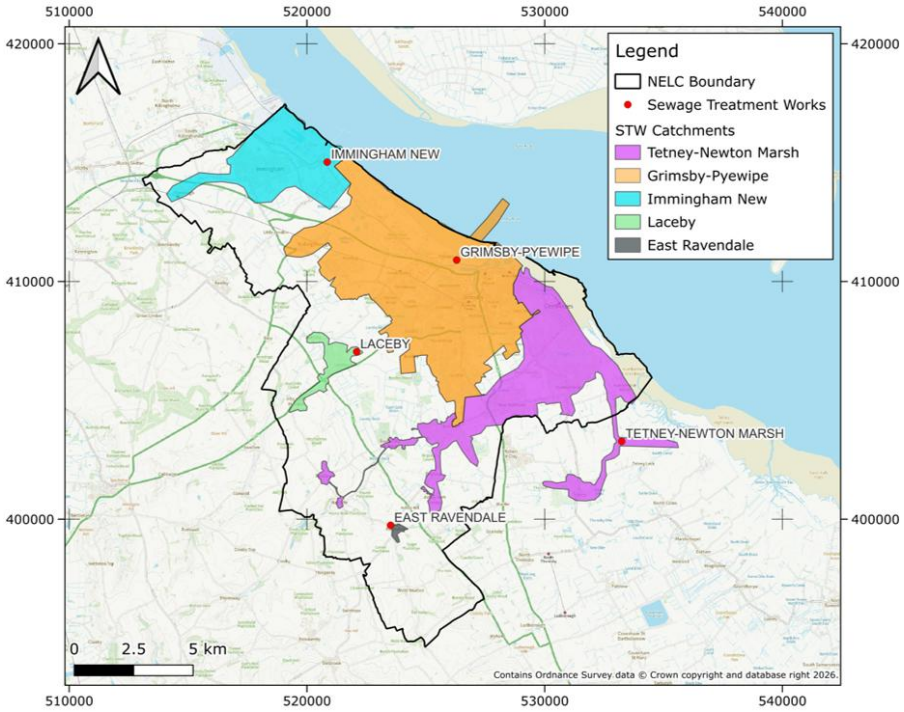

Figure 11 - Sewage Treatment Work Catchments

Tetney-Newton Marsh

Anglian Water estimate the base population within the Tetney-Newton Marsh WRC catchment to be 53,029 in the base year (2021/22) increasing to 55,216 in 2035 but decreasing slightly to 55,101 in 2050. The decrease seen in this catchment and in others is thought to be due to demographic changes and internal migration. Concerns from stakeholders include impacts to bathing waters and tidal inundation. However, Anglian Water have identified this catchment to be low risk in 2050, and so no specific investments are proposed for the Tetney-Newton Marsh WRC within the DWMP.

Grimsby-Pyewipe

Anglian Water estimate the base population within the Grimsby-Pyewipe WRC catchment to be 149,543 in the base year (2021/22) increasing to 151,414 in 2035 but decreasing slightly to 151,277 in 2050. Concerns from stakeholders include impacts to bathing waters and groundwater ingress. However, Anglian Water have identified this catchment to be low risk in 2050, and so no specific investments are proposed for the Grimsby-Pyewipe WRC within the DWMP.

Immingham

Anglian Water estimate the base population within the Immingham WRC catchment to be 12,513 in the base year (2021) increasing to 13,089 in 2035 but decreasing slightly to 13,061 in 2050. Concerns from stakeholders include surface water issues. Anglian Water have identified this

catchment to be at low risk in 2035, but higher risk in 2050. Therefore, a 5% surface water removal has been put forward as a long-term 2050 strategy for improvement.

Laceby

Anglian Water estimate the base population within the Laceby WRC catchment to be 3,037 in the base year (2021) increasing to 3,357 in 2035 but decreasing slightly to 3,344 in 2050. The main concern from stakeholders is that the total phosphorus permit is already set to the technically achievable limit (TAL). Despite this, the receiving watercourse is still performing poorly, therefore there is not much headroom to improve effluent quality with respect to phosphorus. A reduction in effluent flow would be needed to reduce the phosphorus load on the watercourse. However, Anglian Water have identified this catchment to be low risk in 2050, and so no specific investments are proposed for the Laceby WRC within the DWMP.

East Ravendale

Anglian Water estimate the base population within the East Ravendale WRC catchment to be 43 in the base year (2021) decreasing slightly to 42 in 2035 and 2050. As this WRC catchment is very small and serves very few people, limited data is available. Therefore, it was not reviewed further than the initial screening stage.

6.1.3 Combined Sewer Overflows

Many parts of England, including North East Lincolnshire, have a combined sewage system which transports both clean rainwater and wastewater. During heavy rainfall the capacity of these pipes can be exceeded, which means possible inundation of WRCs and backing up of network infrastructure. Combined sewer overflows (CSOs) were developed as overflow valves to reduce the risk of sewage backing up during heavy rainfall. These overflows discharge diluted untreated sewage during heavy rainfall.

The EA work closely with water companies to ensure CSOs are closely monitored to identify where the system is not operating as it should. The Environment Act 2021[41] introduced new requirements, stipulating that storm overflow discharges in England must be reported, including their location and the duration of any spill.

The national government's Storm Overflows Discharge Reduction Plan[42] sets targets for regulators and water companies to prioritise improving the water environment. This ties into some of the aims set out in Anglian Water's DWMP (see section 6.1.1). The reduction plan states that by 2040, water companies should have improved 87% of overflows discharging into high-priority sites, and 60% of all overflows. By 2050 all overflows should be improved. Note, for a CSO to be considered as improved, it must meet the following criteria:

- It must be demonstrated that discharges from the CSOs have no local adverse ecological impact.
- The CSO will not be permitted to discharge above an average of 10 rainfall events per year.
- The CSO has screening controls that avoid pollution by limiting discharge of persistent inorganic material. Disinfection may be required in some cases to reduce harmful pathogens.
- The CSO spills no more than 2 times per season when upstream of a designated bathing water.

[41] Parliament of the United Kingdom (2021) *The Environment Act 2021* https://www.legislation.gov.uk/ukpga/2021/30/contents
[42] DEFRA (2023) *Storm overflows discharge reduction plan.* https://www.gov.uk/government/publications/storm-overflows-discharge-reduction-plan

The requirements above apply to CSOs at WRCs and network CSOs. Two designated bathing water sites are present within the borough, at Cleethorpes and Humberston Fitties.

Anglian Water publish CSO data annually which, along with data from all other water companies, is collated by the EA[12]. The location of CSOs monitored across North East Lincolnshire are shown in Figure 12. One additional CSO point located outside of the borough boundary, at E: 535430, N: 403200, has been included within this review as it is associated with the Tetney-Newton Marsh WRC that serves the southeast of the borough, see Figure 11.

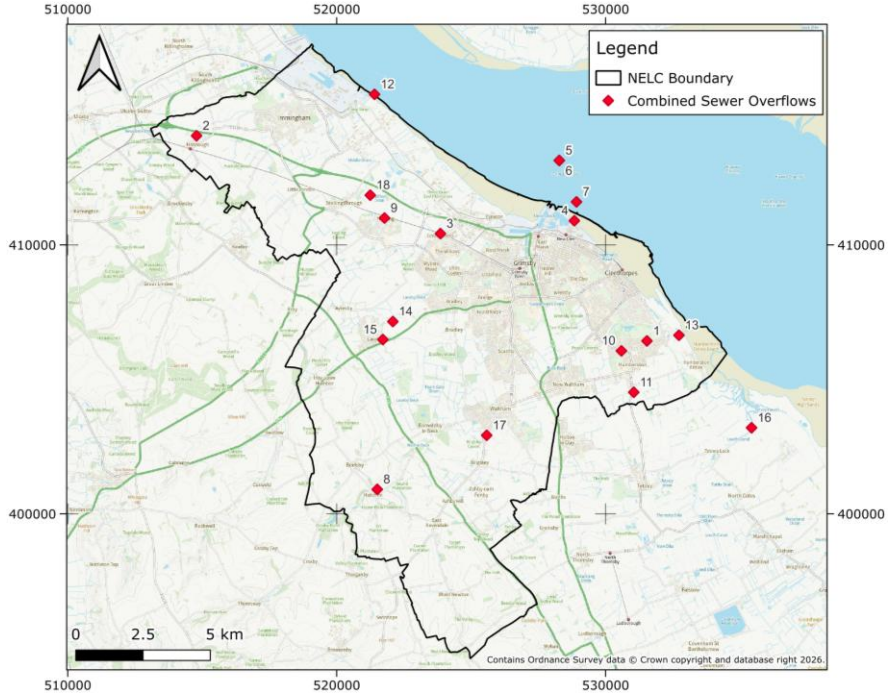

Figure 12 - CSO Discharge Locations

Table 8 provides information on the spill count and duration of spills for these CSOs between 2021 and 2025. A small number of CSO sites account for the majority of spill events and durations over the five-year period (2021-2025) assessed. Combined, the two Grimsby Pyewipe WRC and TPS CSO discharges, which serve the Grimsby Pyewipe WRC, recorded 1022 spills for a total of 3933 hrs (163.9 days). This makes up 37% of the total spill count and 32% of the total duration. Other major contributors are the Laceby WRC (446 spills over 3984 hrs) and Immingham WRC (445 spills over 1698 hrs). It should be noted that these discharge locations have data going back to at least 2021 whereas the majority of other CSO locations do not.

Across the five-year period, 2023 experienced the highest number of spills (692) and the greatest total spill duration (3426 hrs), though 2024 experienced similar numbers (606 spills over 3236 hrs). The years with the smallest spill counts are 2022 and 2025 whilst a moderate number of spills occurred in 2021.

Met Office climate data[43] [44] highlights that in North East Lincolnshire, 2022 and 2025 experienced below average (1991-2020) annual rainfall whereas 2023 and 2024 experienced above average annual rainfall. Annual rainfall in 2021 was similar to the 1991-2020 average. This aligns closely with the pattern of CSO spills and durations, with an increased number and duration of spills during wetter years.

[43] Met Office (2025) *State of the UK climate*, https://www.metoffice.gov.uk/research/climate/maps-and-data/about/state-of-climate.
[44] Met Office (2025) *The year in weather: 2025,* https://www.metoffice.gov.uk/blog/2025/the-met-office-year-in-weather-2025

Table 8 - CSOs

Name (ID)	NGR	Data Start (Year)	Counted Spills (2021) Spill Duration (2021)	Counted Spills (2022) Spill Duration (2022)	Counted Spills (2023) Spill Duration (2023)	Counted Spills (2024) Spill Duration (2024)	Counted Spills (2025) Spill Duration (2025)	Total Counted Spills (2021-2025) Total Spill Duration (2021-2025)
Berners Road Pumping Station (1)	TA3154006430	2021	0 0.00 hrs	7 12.83 hrs	11 9.13 hrs	3 0.63 hrs	1 3.57 hrs	**22** **26.16 hrs**
Cravens Lane Pumping Station (2)	TA1479114060	2023	N/A N/A	N/A N/A	0 0.00 hrs	1 9.75 hrs	4 17.75 hrs	**5** **27.50 hrs**
Great Coates Station Road PS (3)	TA2386010420	2020	3 1.50 hrs	3 1.50 hrs	6 4.50 hrs	12 12.75 hrs	3 3.00 hrs	**27** **23.25 hrs**
Grimsby Fish Docks Pumping Station (4)	TA2884010900	2019	42 82.75 hrs	21 19.00 hrs	31 24.50 hrs	33 59.75 hrs	9 9.75 hrs	**136** **195.75 hrs**
Grimsby Pyewipe WRC And TPS (5)	TA2828013140	2021	24 26.97 hrs	57 83.03 hrs	56 99.20 hrs	38 94.53g hrs	34 106.50 hrs	**209** **410.23 hrs**
Grimsby Pyewipe WRC And TPS (6)	TA2828013140	2021	127 455.60 hrs	122 397.40 hrs	211 1232.43 hrs	198 931.60 hrs	155 505.80 hrs	**813** **3522.83 hrs**
Grimsby Riby St.PS O.F (7)	TA2892011600	2020	21 83.75 hrs	8 32.50 hrs	20 90.00 hrs	17 124.00 hrs	11 26.00 hrs	**77** **356.25 hrs**
Hatcliffe Sewage Pumping Station (8)	TA2151000910	2023	N/A N/A	N/A N/A	3 24.00 hrs	10 61.25 hrs	5 60.25 hrs	**18** **145.50 hrs**
Healing - Poplar Road SSO (9)	TA2178011000	2022	N/A N/A	6 27.75 hrs	10 22.25 hrs	12 52.00 hrs	6 36.50 hrs	**34** **138.50 hrs**
Humberston - Humberston Road CSO (10)	TA3059006060	2019	57 121.75 hrs	35 92.50 hrs	57 205.25 hrs	44 211.25 hrs	41 168.50 hrs	**234** **799.25 hrs**
Humberston - Tetney Road Storm Pump (11)	TA3105004520	2023	N/A N/A	N/A N/A	0 0.00 hrs	2 1.75 hrs	3 9.50 hrs	**5** **11.25 hrs**
Immingham Water Recycling Centre (12)	TA2141015600	2019	97 370.75 hrs	92 226.00 hrs	99 401.23 hrs	82 368.13 hrs	75 331.97 hrs	**445** **1698.08 hrs**
Kings Rd Pumping Station (13)	TA3273006640	2021	1 0.70 hrs	0 0.00	2 5.17 hrs	2 4.20 hrs	1 4.60 hrs	**6** **14.67 hrs**
Laceby Water Recycling Centre (14)	TA2209007150	2020	115 1116.00 hrs	60 272.00 hrs	108 1032.00 hrs	113 1198.50 hrs	50 365.50 hrs	**446** **3984.00 hrs**
Laceby-Caistor Road #1 CSO (15)	TA2172006480	2019	59 134.00 hrs	45 122.50 hrs	34 130.75 hrs	0 0.00 hrs	1 9.25 hrs	**139** **396.50 hrs**
Newton Marsh Water Recycling Centre (16)	TA3543003200	2018	31 25.60 hrs	28 19.93 hrs	37 43.47 hrs	34 66.20 hrs	10 49.47 hrs	**170** **204.67 hrs**
Normans Corner Pumping Station (17)	TA2558002920	2022	N/A N/A	0 0.00 hrs	7 102.25 hrs	5 39.75 hrs	5 45.25 hrs	**17** **187.25 hrs**
Stallingborough-S Marsh Lane SPS (18)	TA2125011850	2023	N/A N/A	N/A N/A	0 0.00 hrs	0 0.00 hrs	0 0.00 hrs	**0** **0.00 hrs**
Total Counted Spills Across All Sites			**577**	**484**	**692**	**606**	**414**	**2773**
Total Spill Duration Across All Sites			**2419.37**	**1306.94**	**3426.13**	**3236.05**	**1753.15**	**12141.64 hrs**

6.1.4 Site Specific Assessments (RAG Reports)

Commented [JL8]: These should be provided by Anglian Water by the end of August.

6.2 Headroom Assessments

Increased domestic population and/or employment activity can lead to increased wastewater flows arriving at WRCs. Where there is insufficient headroom at the works to treat the increased flow, breaches to the permitted volume of effluent discharged from the site can occur. This is a risk to the water quality of the receiving watercourse. A lack of headroom at a WRC can also lead to more regular exceedance of the upstream sewer network capacity, increasing the number of untreated sewer discharges via CSOs.

To assess the headroom capacity of the WRCs within the borough, the methodology outlined in section 2.4.2 has been applied considering the quantum of development being brought forward within the Local Plan. Four WRCs have been identified as having the potential to be affected by the proposed future development within the borough. These are Immingham, Laceby, Grimsby-Pyewipe, and Tetney-Newton Marsh. East Ravendale has not been included within this assessment as it is a small WRC serving a population of 43, with no sites allocated within its catchment. It's permitted dry weather flow (DWF) is 35 m^3/day.

6.2.1 Review of Dry Weather Flows (DWF)

An initial assessment of headroom capacity at WRCs was undertaken using DWF data supplied by Anglian Water from 2020 to 2025. Table 9 shows the 80th and 90th percentile annual exceedance flow values recorded at each WRC between 2020-2025.

Table 9 - 80th and 90th Percentile Annual Exceedance Flow Values (2020-2025)

WRC	2020	2021	2022	2023	2024	2025
	Q80 (m^3/day)					
Immingham	2080	2265	2155	2141	2210	1980
Laceby	707	792	604	714	951	738
Grimsby-Pyewipe	12405	12672	11335	12782	12415	11750
Tetney-Newton Marsh	37911	36840	32190	36123	34251	31608
	Q90 (m^3/day)					
Immingham	2002	2114	2042	1990	2101	1876
Laceby	630	708	552	634	876	640
Grimsby-Pyewipe	11841	11966	10677	11645	11706	11351
Tetney-Newton Marsh	35552	34409	30847	34428	32172	30086

Figure 13 displays the trends in the 80th percentile annual exceedance flow values between 2020 and 2025. The monitoring data does not show a clear increasing or decreasing trend at any WRC but does highlight low flows in 2022 and 2025 likely associated with the low volume of rainfall experienced in these years.

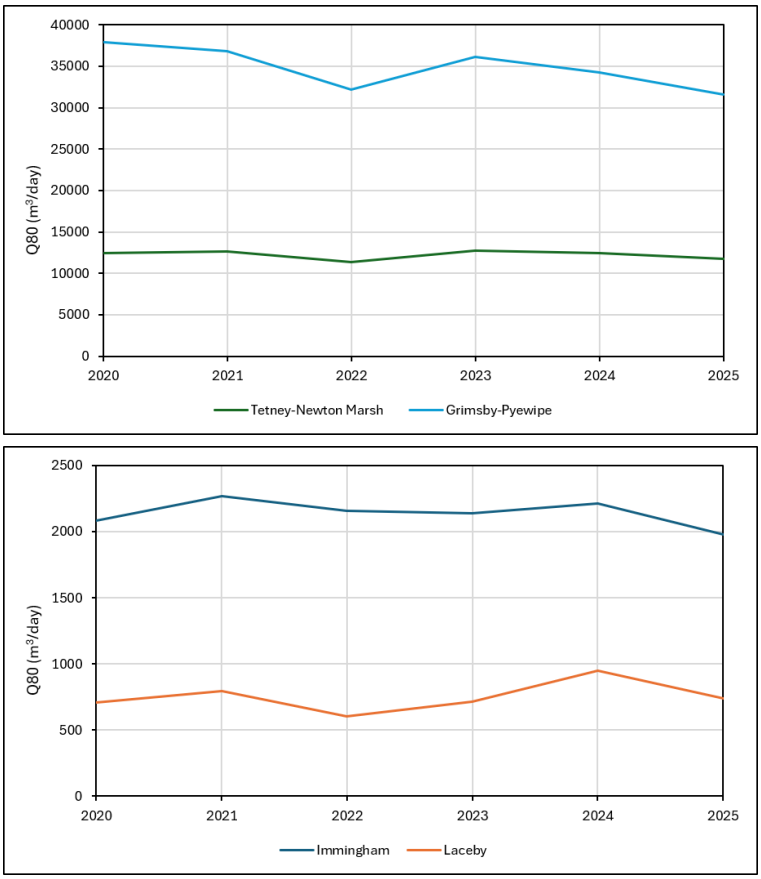

Figure 13 - Trends in 80th Percentile Annual Exceedance Flow Values (2020-2025)

As no significant trends are shown in the data, the baseline flows within the headroom assessments are based upon the five-year average between 2021 and 2025. These flows are displayed below in Table 10 and compared against the 2025 flows. As the average flow is always greater than the 2025 flow, it ensures that the available capacity at an WRC is not overestimated.

Table 10 – Five-Year Average Flow Compared with 2025 Flow

WRC	Average Q80 (2021-2025)	2025 Q80	Average Q90 (2021-2025)	2025 Q90
Immingham	2150	1980	2025	1876
Laceby	760	738	682	640
Grimsby-Pyewipe	12191	11750	11469	11351
Tetney-Newton Marsh	34202	31608	32388	30086

6.2.2 Results

Immingham WRC

Immingham WRC discharges to the River Humber at (E: 521410, N: 415600) with a DWF permit level of 3,117 m^3/day. Within the emerging Local Plan, 18 sites are proposed within its catchment of which eight are residential sites and ten are employment sites. Together these propose to provide 2,045 dwellings (including approximately 10 windfall dwellings per year) and 2,037 jobs across the plan period.

The headroom assessment, shown in Figure 14, indicates that the permitted DWF is not exceeded under the current conditions with the baseline Q80 flow 69% of the permitted DWF. When considering the quantum of development proposed within the Local Plan, and its distribution across the plan period, Figure 14 shows the Q80 flow remains below the permitted DWF but increases by 620 m^3/day to 89% of the permitted flow.

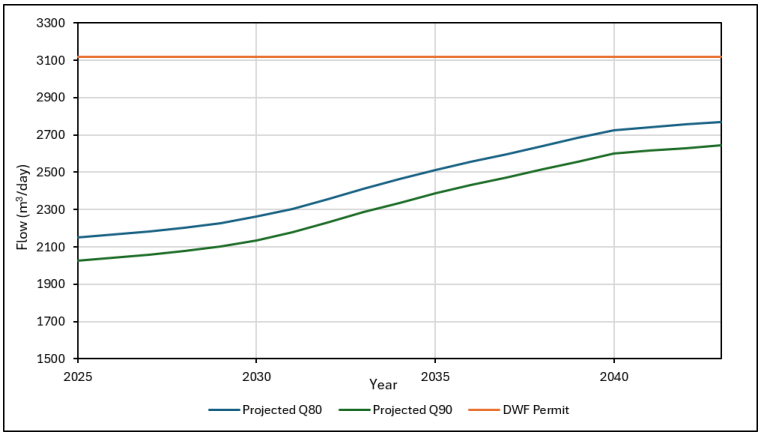

Figure 14 - Immingham WRC Headroom Forecast (2025-2043)

The assessment indicates that the permitted DWF will not be exceeded during the plan period due to future development. However, there are concerns from stakeholders regarding surface water issues within its catchment. Therefore, Anglian Water have set a target of reducing surface water inputs to the WRC by 5% in 2050. Furthermore, as part of the Price Review 2024 (PR24)[45], a target set for the Immingham WRC is to reduce storm overflow discharges to less than 10 per year, planned for completion in 2030. Reducing surface water inputs, decreases the risk of CSO spills and increases the capacity to treat sewage flows. The use of SuDS in the catchment, both in new developments and retrofit, is likely to be a major component of this reduction.

[45] Environment Agency (2026) *Price Review 2024 Water Industry National Environment Programme (WINEP) App.* https://experience.arcgis.com/experience/67699929adf94668843b306520605c27/page/Map#data_s=id%3AdataSource_1-19614bff329-layer-5%3A1472

Laceby WRC

Laceby WRC discharges to the Laceby Beck at (E: 522090, N: 407150) with a DWF permit level of 732 m^3/day. Within the emerging Local Plan, three sites are proposed within its catchment of which all are residential. Together these propose to provide 425 dwellings across the plan period, including an allowance for 2 windfall dwellings per year.

The headroom assessment, shown in Figure 15, indicates the permitted DWF is already exceeded by the Q80 flow (104% of permitted flow) but is not yet exceeded by the Q90 flow (93% of the permitted flow). When considering the quantum of development proposed within the Local Plan and its distribution across the plan period, Figure 15 shows two significant increases in flow at the start and end of the plan period (between 2027 and 2032, and 2038 and 2043) with the Q90 flow estimated to exceed the permitted DWF in 2030/31 reaching 108% of the current permitted flow by the end of the plan period. In terms of the Q80 flow, it is estimated to increase by 108 m^3/day to 118% of the current permitted flow.

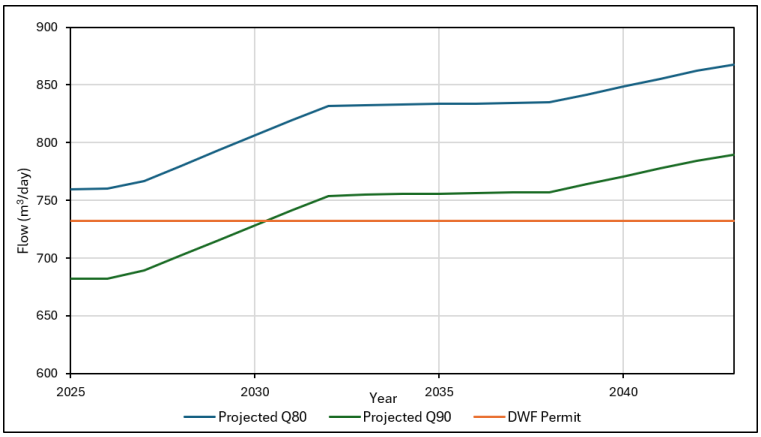

Figure 15 - Laceby WRC Headroom Forecast (2025-2043)

The assessment shows the Laceby WRC to already be exceeding its permitted DWF with the proposed development resulting in further increases to the Q80 and Q90 flows. Therefore, the Laceby WRC will require upgrades and or mitigations before development can proceed sustainably.

There are also concerns from stakeholders that the discharge permit for the WRC is already at the total phosphorus technically achievable limit (TAL). Therefore, any increases in the volume of discharge will result in an increase in phosphorous discharged to the Laceby Beck as the current pollutant loading is as low as the technology currently allows.

As part of PR24[45], a standstill limit was put in force for cypermethrin, an insecticide, planned for completion in 2027. In addition, 6mm screening on storm overflows at Laceby-Caistor Road SSO is also proposed in AMP8, planned for completion in 2030. However, Anglian Water have not identified any specific investments for the Laceby WRC within the DWMP to increase its treatment capacity.

Given the existing capacity constraints, Anglian Water may need to seek amendments to the DWF permit to accommodate future flows. Such permit changes will likely need to be supported by upgrades to the treatment works infrastructure. Any applications for permit amendments should be progressed well in advance of planned development coming forward within the catchment.

Grimsby-Pyewipe WRC

Grimsby-Pyewipe WRC discharges to the River Humber at (E: 528280, N: 413140) and (E: 526320, N: 411080) with a DWF permit level of 46,730 m^3/day. Within the emerging Local Plan, 44 sites are proposed within its catchment of which 33 are residential and 11 are employment. Together these propose to provide 5,816 dwellings across the plan period (including approximately 34 windfall dwellings per year) and 7,956 jobs.

The headroom assessment, shown in Figure 16, indicates that the permitted DWF is not exceeded under the current conditions with the baseline Q80 flow 73% of the permitted DWF. When considering the quantum of development proposed within the Local Plan, and its distribution across the plan period, Figure 16 shows the Q80 flow remains below the permitted DWF but increases by 1872 m^3/day to 77% of the permitted flow.

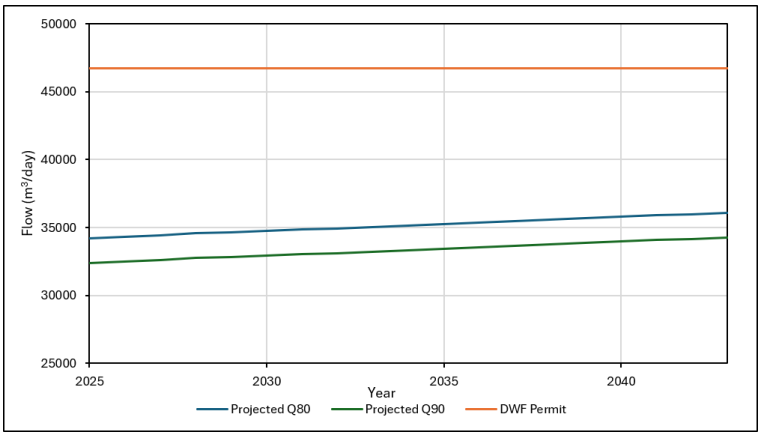

Figure 16 – Grimsby-Pyewipe WRC Headroom Forecast (2025-2043)

The assessment indicates that the permitted DWF will not be exceeded during the plan period due to future development. However, there are concerns from stakeholders regarding bathing waters and groundwater ingress issues within its catchment. Despite this, Anglian Water have not identified any specific upgrades for the WRC within their DWMP. However, as part of PR24[45], 6 mm screening on storm overflows and a reduction in their number to below 10 per year has been included within AMP8 for the Grimsby Riby St CSO within its catchment.

Tetney-Newton Marsh

Tetney-Newton Marsh WRC discharges to the Louth Canal at (E: 535430, N: 403200) with a DWF permit level of 23,867 m^3/day. Within the emerging Local Plan, 33 sites are proposed within its catchment of which all are residential. Together these propose to provide 3,684 dwellings across the plan period (including approximately 19 windfall dwellings per year).

The headroom assessment, shown in Figure 17, indicates that the permitted DWF is not exceeded under the current conditions with the baseline Q80 flow 51% of the permitted DWF. When considering the quantum of development proposed within the Local Plan, and its distribution across the plan period, Figure 17 shows the Q80 flow remains below the permitted DWF but increases by 934 m^3/day to 55% of the permitted flow.

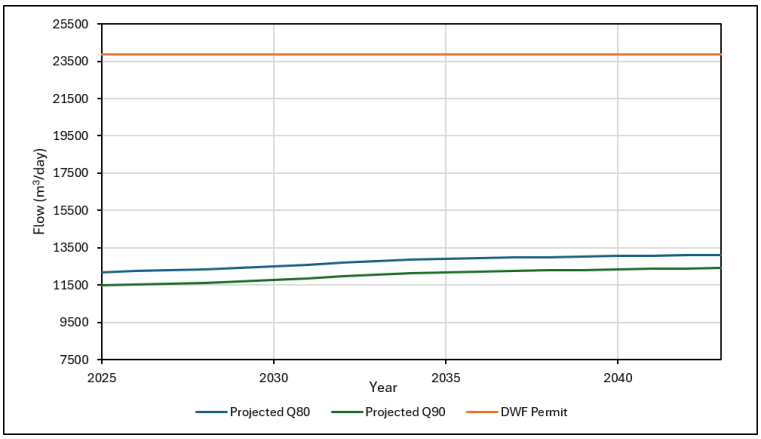

Figure 17 – Tetney-Newton Marsh WRC Headroom Forecast (2025-2043)

The assessment indicates that the permitted DWF will not be exceeded during the plan period due to future development. However, there are concerns from stakeholders regarding bathing waters and tidal inundation issues within its catchment. Despite this, Anglian Water have not identified any specific upgrades for the WRC within their DWMP.

6.2.3 Summary

Table 11 provides a summary of the headroom assessments when considering the Q80 flow, the flow typically used by the EA when setting permits.

At three of the four WRCs assessed, the current permitted DWF is not expected to be exceeded by the end of the plan period. However, at the Laceby WRC the permitted DWF has already been exceeded by the Q80 flow in three of the past five years. Although only 425 dwellings are proposed in its catchment, the additional development is estimated to increase the Q90 flow (reviewed for compliance purposes) above the DWF permit as well. This is forecast to occur in 2030/31.

Table 11 - Summary of Headroom Assessments for Q80 Flow (m^3/day)

WRC	Permitted DWF	Baseline Q80 (2025)	Projected Q80 (2043)	Projected Available Headroom (%)
Immingham	3,117	2,150	2,770	11.12
Laceby	732	760	867	-18.48
Grimsby-Pyewipe	23,867	12,191	13,125	45.01
Tetney-Newton Marsh	46,730	34,202	36,074	22.80

At all the WRCs, though especially at Laceby, the available capacity will need to be considered when phasing development in liaison with Anglian Water, particularly when phasing larger scale developments (>500 dwellings). It should be noted that the headroom assessments assume that all local plan allocations and existing planning applications will be built and do not take into account planned or longer-term changes to DWF, treatment systems, or storage capacity.

Anglian Water will need to invest in the Laceby WRC to ensure compliance to 2043 and to allow development to occur sustainably within its catchment. However, no specific investments were

identified within their DWMP. Furthermore, whilst the other WRCs appear to have sufficient headroom, some stakeholders have flagged other issues which may require investment and upgrades. In this regard, liaison between the council and Anglian Water will be required to confirm the current condition of WRCs, before agreeing development phasing, proposed mitigations, and lead in times. Liaison with the EA will also be integral, especially at Laceby where a new permit for the WRC is likely to be required.

It is recommended that North East Lincolnshire Council takes the following actions:

- Consider the available WRC capacity when phasing development in liaison with Anglian Water, with particular focus in the Laceby WRC catchment.
- Provide Annual Monitoring Reports to Anglian Water detailing projected housing growth in their administrative area and larger scale developments coming forward.
- Provide a copy of the WCS to the EA and Anglian Water.
- Provide a copy of the WCS to planning colleagues at neighbouring authorities.
- Promote the use of SuDS at development sites and where appropriate sewer separation.

6.3 Review of Environmental Capacity

6.3.1 Humber River Basin Management Plan

The Humber River Basin District (RBD) River Basin Management Plan (RBMP)[8], published by DEFRA and the EA in 2022 with an update in 2024, describes the issues that threaten the water environment within the Humber RBD and provides a framework for how these can be managed. As water and land resources are closely linked, it also informs decisions on land use planning.

A River Basin Management Plan covers the following areas which relate to management of land and water:

- Baseline classification of water bodies
- Statutory objectives for protected areas
- Statutory objectives for water bodies
- Challenges for the water environment
- Summary programme of measures to achieve statutory objectives

The Water Framework Directive (WFD)[2], transposed into law by the Water Environment Regulations 2017 in England and Wales[3], provides most of the legislative basis for the RBMP. Water bodies are assessed based on a range of classification elements relating to the ecological and chemical quality of surface waters. The overall ecological and chemical statuses are determined by the lowest status of any individual classification element.

Table 12 - Definition of Ecological Status under the Water Framework Directive

Status	Definition
High	Near natural conditions. No restriction on the beneficial uses of the water body. No impacts on amenity, wildlife, or fisheries.
Good	Slight change from natural conditions because of human activity. No restriction on the beneficial uses of the water body. No impact on amenity or fisheries. Protects all but the most sensitive wildlife.
Moderate	Moderate change from natural conditions because of human activity. Some restriction on the beneficial uses of the water body. No impact on amenity. Some impact on wildlife and fisheries.
Poor	Major change from natural conditions because of human activity. Some restrictions on the beneficial uses of the water body. Some impact on amenity. Moderate impact on wildlife and fisheries.
Bad	Severe change from natural conditions because of human activity. Significant restriction on the beneficial uses of the water body. Major imp act on amenity. Major impact on wildlife and fisheries with many species not present.

These status classes feed into the overall environmental objectives of the WFD and the associated RBMP. The environmental objectives are:

- To prevent deterioration of the status of surface waters and groundwater.
- To achieve objectives and standards for protected areas.
- To aim to achieve good status for all water bodies.
- To reverse any significant and sustained upward trends in pollutant concentrations in groundwater.
- The cessation of discharges, emissions and priority hazardous substances into surface waters.
- Progressively reduce the pollution of groundwater and prevent or limit the entry of pollutants.

The RBMP outlines the measures that may be required to achieve these statutory objectives and the regulators/operators responsible. These measures are/will be essential in maintaining environmental capacity in response to increased development and population growth. Table 13 summarises some of the key measures relevant to the borough.

Table 13 - Key Measures Summarised from the Humber RBD RBMP

Category	Measure	Description	Key Stakeholders
Advice Schemes	Championing the Farmed Environment and Tried and Tested	Advice to farmers on environmental improvements and nutrient management.	NFU
Education, Targeted Information	Aquatic Biosecurity Campaigns	Slowing spread of invasive species via public awareness.	GB Non-Native Species Secretariat
	Water Leaders Group	Aligning approaches to behaviour change campaigns on water.	EA and Anglian Water
Financial Incentives	Restoring an Urban Chalk Stream – River Freshney	Carry out a river restoration scheme to improve habitat and encourage natural river processes. Carry out a community engagement programme to enthuse local communities about their local environment.	Lincolnshire Chalk Stream Project
	England Woodland Creation Offer	Tree planting to achieve UK Net Zero with incentives to target woodlands in areas with flood, water quality/resources biodiversity and climate adaptation benefits.	Forestry Commission
	Maritime Fisheries Fund	Support measures to protect migratory fish in the marine environment.	Government Funded Agencies
	Green Recovery Challenge Fund	Environmental improvement projects including river, lake and wetland restoration, tree planting and land management to address pollution.	DEFRA
	Natural Environment Investment Readiness Fund (NEIF)	Restore wetlands and freshwater, create new woodlands.	EA
	EA Environment Programme and Flood and Coastal Risk Management - Capital Program	Diffuse pollution control, recovery of priority species (habitat restoration/ re-introduction of species), delivery of mitigation measures for Flood and Coastal Erosion Risk Management assets (river restoration and fish pass improvements).	NGOs, EA, Government Funded Agencies and Anglian Water
	EA Flood Coast Risk Management - Coastal Habitat Compensation and Restoration Programme	Replace habitats that are lost due to coastal squeeze or tidal inundation effects that arise from the management of coastal defences.	Environment Agency / Risk Management Authorities
	Nature for Climate peatland restoration capital grant scheme	Creation and restoration of peatland.	DEFRA / Natural England
	Paludiculture Exploration Fund	Enable paludiculture (wetter farming) to become viable as a way of conserving carbon by raising the water table in peat soils, whilst maintaining a (different) peatland agricultural land use.	DEFRA / Natural England
	Natural Environment Investment Readiness Fund (NEIF)	Create new woodlands, restore peatlands, create new coastal wetlands, restore freshwaters and wetlands.	EA
	Blue Impact Fund	Developing ocean trust fund to support marine environmental enhancement	Environment Finance / World Wide Fund for Nature
	The Flood and Coastal Resilience Innovation Programme	Various measures to improve flood resilience e.g. nature based solutions and sustainable drainage systems	EA
	Catchment Sensitive Farming Rural Development Programme England	Various environmental improvements by farmers and land managers including on farm, river corridor improvements and wider collaborative nature based solutions including Natural Flood Management	Environment Agency / Natural England
	Environment Land Management Schemes	Various environmental improvements by land managers and farmers including nature based solutions and river corridor improvements	DEFRA
	Water Environment Improvement Fund	Local habitat/invasive species improvement schemes and pollution control initiatives	EA
Guidance / Process	Water Leaders Group	To act as advocates for restoration of natural processes within freshwater catchments. Implement measures through Paid Ecosystem Service markets.	EA
	Nature Based Solutions Landscapes Project	A set of demonstration projects to develop the multi-sector funding approach to landscape-scale nature-based Solutions, funded through Shared Outcome Fund.	EA

Category	Measure	Description	Key Stakeholders
	Water Environment Transformation (WET) Programme	To support wider implementation of nature-based solutions through PR24 process and the agriculture sector.	EA
	A new framework of Green Infrastructure Standards	Supports mainstreaming of good green-blue infrastructure. Various measures that result in greener cities and cleaner waters.	Natural England
	Drainage Wastewater Management Plans	To inform measures identified by Water Industry in Price Review24	EA and Anglian Water
Non-regulatory	Nature Recovery Network	Various actions to protect, improve, expand, and connect habitats including water and water-dependent environments.	Natural England
	Local Nature Recovery Strategies	Various actions to protect, improve, expand and connect habitats including water and water-dependent environments. These will be identified through the Statement of Biodiversity Priorities and the Local Habitat Map in each Local Nature Recovery Strategy.	Natural England
Partnerships	Catchment partnership led projects and measures	Related to multiple funding streams and outcomes for water quality, quantity, habitat and flood risk reduction.	EA and Anglian Water
	Water Industry Green Recovery Programme	Various environmental improvement projects and pollution control initiatives e.g. pollution control, abstraction management and habitat restorations.	Anglian Water
Regulatory	Water Industry National Environment Programme (WINEP) schemes	Habitat improvements and farm nutrient management plans. Sewage treatment improvements through changes to licence conditions at specific sites. Sustainable abstraction improvements through changes to abstraction licences, licence conditions and non-licence changes at specific sites.	EA and Anglian Water
	Implementation of the Water Resources Catchment Based Approach (CaBA) Chalk Stream Restoration Group (CSRG) chalk strategy	Policy and voluntary measures to drive abstraction reductions in ground and surface waters in chalk catchments. A local response to climate change and abstraction pressure in these catchments. Policy support is intended to develop to underwrite these.	EA
	Regulation of agricultural and rural land including targeted regulation of protected areas such as Nitrate Vulnerable Zones	Activity focusses on compliance with the Farming Rules for Water; compliance with Silage Slurry and Agricultural Fuel Oil Regulations.	EA
	Environment Agency Navigation Capital Asset Investment	Addressing physical modification on Environment Agency owned regulatory assets to maintain navigable waterways and restore fish passage.	EA
	Development Planning - Statutory Biodiversity net gain	Planning requirement that aims to ensure that developments have a net positive impact on biodiversity overall, by minimising any negative impacts, restoring existing areas or offsetting.	Local Authority
	Water Resource Assets Capital Investment	Ensure water transfer schemes are safe, resilient, environmentally sustainable and can operate when required.	EA
Research	Water Leaders Group	Developing shared guidance and case studies for integrating investment in and across catchments.	EA

6.3.2 Surface Water

The EA's catchment data explorer[9] and the recently published 2025 cycle 4 classifications[46] were used to extract information about the water environment for several catchments in North East Lincolnshire. The dataset provides information on the ecological and chemical status of catchments throughout the UK.

The ecological status of catchments can be classified as *Bad, Poor, Moderate, Good* or *High*. For the chemical status, catchments are classed as either as *Fail* or *Good*. For this study the classifications are used to assess existing pressures on specific catchments and understand their environmental capacity. The WFD River Waterbody catchments that intersect North East Lincolnshire are shown in Figure 18 with further details of their ecological and chemical statuses shown in Table 14 alongside any reasons for not achieving *Good* (RNAG) status. No RNAG data is currently available for the 2025 cycle 4 assessments which were published in August 2026. Therefore, the reasons for not achieving good from 2022 have been included with any elements now achieving *Good* status removed. The condition of waterbodies across the borough is discussed in more detail after the table.

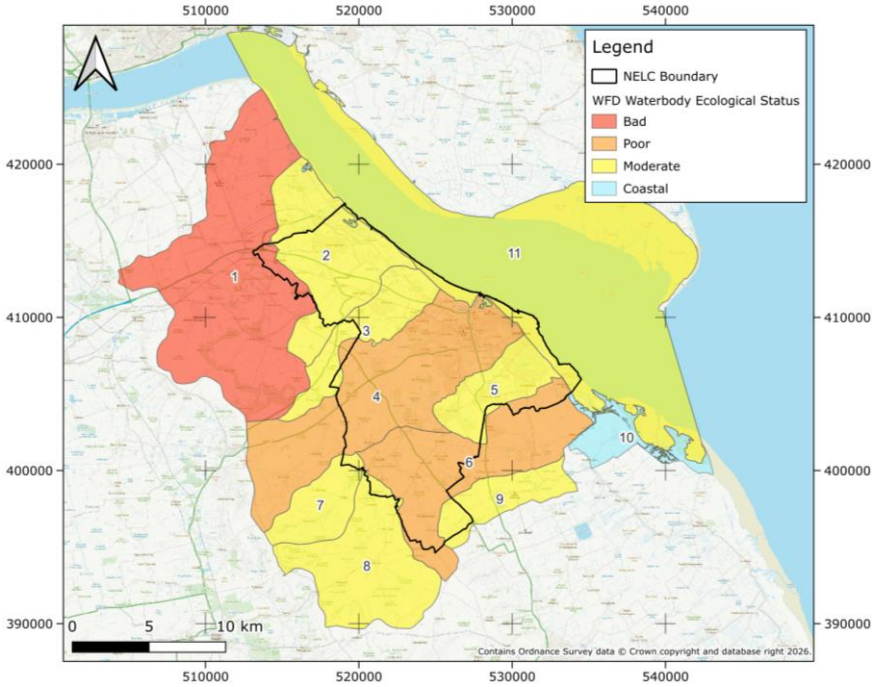

Figure 18 - WFD River Waterbody Catchments

[46] Environment Agency (2026) *WFD River Water Body Catchments Cycle 4 Classification 2025 (Full Resolution).* https://environment.data.gov.uk/dataset/69e41965-4e07-44cb-93b5-4a32bff75efa

Table 14 - Ecological and Chemical Status of Surface Waterbodies in North East Lincolnshire (worst element highlighted in bold)

ID	Waterbody Name	Hydromorphological Designation	Ecological Status	Chemical Status	Reasons for not Achieving Good Ecological Status	
					Water Industry	Other Categories
1	Skitter Beck / East Halton Beck	Heavily modified	Bad	Fail	Elements: Macrophytes and Phytobenthos, **Fish**, Hydrological Regime Activity: Sewage discharge (continuous), Groundwater Abstraction	Elements: Macrophytes and Phytobenthos, **Fish**, Mitigation measures assessment Activity: Poor livestock and nutrient management, Land drainage, Flood protection structures
2	North Beck Drain	Heavily modified	Moderate*	Fail	Elements: None Activity: None	Elements: Hydrological Regime, Mitigation measures assessment Activity: Flood protection, Land drainage, Urbanisation
3	Mawnbridge Drain	Heavily modified	Moderate*	Fail	Elements: None Activity: None	Elements: Hydrological Regime Activity: Flood protection, Land drainage
4	Laceby Beck / River Freshney	Heavily modified	Poor	Fail	Elements: Phosphate, **Fish**, Hydrological regime Activity: Sewage discharge (continuous), Groundwater Abstraction	Elements: **Fish**, Phosphate, Mitigation measures assessment Activity: Urban development, Invasive non-native species, Poor soil and nutrient management, Land drainage, Trade/industry discharge, Barriers to ecological continuity, Flood protection
5	Buck Beck	Heavily modified	Moderate†	Fail	Elements: Phosphate Activity: Sewage discharge (intermittent)	Elements: Phosphate, Invertebrates, **Fish**, Mitigation measures assessment Activity: Urban development, Flood protection, Land drainage, Poor nutrient management
6	Waithe Beck Lower Catchment	Heavily modified	Poor	Fail	Elements: None Activity: None	Elements: **Macrophytes and Phytobenthos**, Mitigation measures assessment Activity: Flood Protection, Land drainage

ID	Waterbody Name	Hydromorphological Designation	Ecological Status	Chemical Status	Reasons for not Achieving Good Ecological Status	
					Water Industry	Other Categories
7	Thoresway Beck	Not designated artificial or heavily modified	Moderate	Fail	Elements: None Activity: None	Elements: **Macrophytes and Phytobenthos**, **Invertebrates** Activity: Poor soil, livestock, and nutrient management
8	Waithe Beck Upper Catchment	Not designated artificial or heavily modified	Moderate	Fail	Elements: None Activity: None	Elements: **Fish** Activity: Land drainage, Poor nutrient management
9	New Dike Catchment	Heavily modified	Moderate	Fail	Elements: None Activity: None	Elements: **Mitigation measures assessment** Activity: Land drainage, Flood protection
10	Coastal Catchment		n/a	n/a	n/a	n/a
11	Humber Lower (TraC)	Heavily modified	Moderate	Fail	Elements: None Activity: None	Elements: **Mitigation measures assessment**, **Angiosperms, Dissolved Inorganic Nitrogen** Activity: Coastal protection, Flood protection

***** No biological element classifications available.

† Despite Fish being classified as Bad and Invertebrates as Poor, this waterbody still achieves a moderate status as it is categorised as heavily modified. For some waterbodies it is not considered achievable to reach Good ecological status in some elements. Therefore, they are assessed against different objectives aiming to reach Good Ecological Potential (GEP) rather than Good ecological status.

The water industry is identified as one of the reasons why the WFD catchments have not achieved Good status in three WFD catchments: Skitter Beck / East Halton Beck, Laceby Beck / River Freshney, and Buck Beck. Within the Skitter Beck / East Halton Beck and Laceby Beck / River Freshney catchments this is due to a combination of continuous diffuse sewage discharge (i.e. treated effluent from WRCs) and groundwater abstractions. Whereas in the Buck Beck catchment this is due to intermittent sewage discharges at point locations (i.e. CSOs). These watercourses are therefore particularly vulnerable to future development, with current failures in nutrients and biological quality associated with sewage discharge. Caution may need to be taken in terms of development phasing in these catchments to allow for upgrades to wastewater infrastructure to take place and environmental recovery.

All WFD surface water catchments have a *Fail* chemical status as of 2025 as the methods for measurements were changed by the EA before the cycle 3 classifications in 2019 and the evidence base was increased. The *Fail* status is generally due to Mercury and Polybrominated diphenyl ethers (PBDE) though other chemical compounds also contribute in some catchments.

Most watercourses within the borough are classed as heavily modified. This means that for some elements, it may not be possible for the catchment to reach *Good* ecological status. Therefore, the watercourse is assessed against a different set of objectives dependent on its circumstances and modifications. These watercourses instead aim to reach *Good* ecological potential which considers these objectives.

6.3.3 Groundwater

The EA catchment data explorer was also used to assess the status of groundwater bodies[9]. Groundwater bodies are measured against a quantitative status and a chemical status. Good quantitative status can be achieved by ensuring that the available groundwater resource is not reduced by the long-term annual average rate of abstraction. In addition, impacts on surface water linked with groundwater or groundwater-dependent terrestrial ecosystems should be avoided, as should saline intrusions.

As shown in Figure 19, the entire borough is underlain by the North Lincolnshire Chalk Unit WFD Groundwater Body which has both a *Poor* quantitative and chemical status. Table 15 shows the reasons for not achieving good status are independent for the quantitative and chemical statuses. Groundwater abstractions by the water industry are stated as the reason for not achieving *Good* quantitative status whereas poor nutrient management on agricultural and rural land is the reason for not achieving *Good* chemical status. The catchment data explorer suggests the objectives for the groundwater body are to reach *Good* chemical status by 2060, however it will be disproportionately expensive for the waterbody to reach *Good* quantitative status. This is likely to be due to its use as a potable water supply.

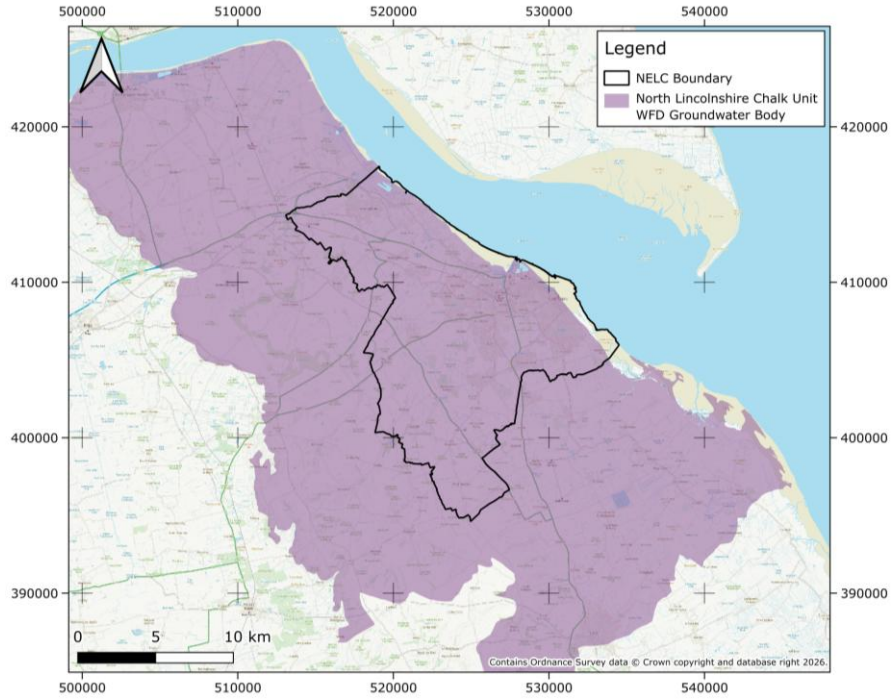

Figure 19 - WFD Groundwater Bodies

Table 15 - North Lincolnshire Chalk Unit Reasons for Not Achieving Good (RNAG) Status

Status	Activity	Category
Chemical	Poor nutrient management	Agriculture and rural land management
Quantitative	Groundwater abstraction	Water industry

6.4 WRC Screening Assessment

Considering the WFD status of the receiving waterbodies summarised above and the analysis carried out in sections 6.2 and 6.3, a screening assessment has been undertaken at each WRC. This includes the baseline and projected available headroom, the current ecological status of the receiving waterbody and any reasons for it not achieving good status, plus any planned WRC upgrades detailed in Anglian Water's DWMP.

The screening assessment looks to identify if future development poses a significant risk to water quality in any areas and confirm if any additional evidence, like water quality modelling, is required to further assess the impacts of development.

Table 16 shows the results of the screening assessment. It highlights the Laceby WRC to be the most at risk of causing deterioration to its receiving waterbody; the Laceby Beck/River Freshney. As the baseline Q80 headroom is negative, there is already a shortage of infrastructural capacity at the

WRC, with the deficit expected to increase across the plan period from 3.77% to 18.48%. Furthermore, the baseline ecological status of the Laceby Beck/River Freshney is *Poor*, with sewage discharge highlighted as a reason for it not achieving *Good* status. Therefore, it is likely to be vulnerable to deterioration from increased sewage discharges. Furthermore, no major upgrades are currently planned at the works.

In this regard, water quality modelling has been completed to assess the potential impacts of increased effluent flows from the Laceby WRC on the Laceby Beck/River Freshney, to identify whether the proposed growth within the WRC catchment has the potential to cause a deterioration to the waterbody and its WFD status. The results of this assessment are provided below in Section 6.5.

At the other three major WRCs that serve the borough, it was not deemed necessary to complete water quality modelling as all are shown to have at least 10% available headroom remaining at the end of the plan period. Furthermore, all three discharge to the Humber Lower TraC which has a moderate ecological classification with no RNAGs attributed to the water industry. This suggests that the WRCs have sufficient infrastructural capacity to treat the increased wastewater flows and the receiving waterbody has the environmental capacity to receive the increased volume of treated effluent without causing significant deterioration in water quality.

Table 16 - WRC Screening

WRC	Baseline Available Q80 Headroom (%)	Projected Available Q80 Headroom (%)	Receiving Waterbody	WFD		Reasons for Not Achieving Good Status	WRC Planned upgrades in DWMP
				Waterbody	Ecological Status		
Immingham	31.02	11.12	River Humber	Humber Lower (TraC)	Moderate	Coastal protection, Flood protection	5% reduction in surface water inputs by 2050
Laceby	-3.77	-18.48	Laceby Beck	Laceby Beck/River Freshney	Poor	**Sewage discharge (continuous)**, Groundwater Abstraction, Urban development, Invasive non-native species, Poor soil and nutrient management, Land drainage, Trade/industry discharge, Barriers to ecological continuity, Flood protection	None
Grimsby-Pyewipe	48.92	45.01	River Humber	Humber Lower (TraC)	Moderate	Coastal protection, Flood protection	None
Tetney-Newton Marsh	26.81	22.80	Louth Canal	Humber Lower (TraC)	Moderate	Coastal protection, Flood protection	None

6.5 Water Quality Modelling

6.5.1 Background

An increase in the volume of effluent discharged from WRCs can negatively impact the water quality of the receiving watercourse. Under the Water Framework Directive (WFD)[2], deterioration should not occur to the current overall or element WFD statuses, as defined in Table 12. Although many elements are assessed under the WFD, this study assesses the following:

Ammonia: An inorganic compound of nitrogen and hydrogen with the formula NH_3. It is used within fertilisers, cleaning products, and in the production of plastics. Sewage is another key source of ammonia.

Biochemical Oxygen Demand (BOD): A measure of the amount of oxygen used by microorganisms to break down organic matter in water. It is an important indicator of water quality and organic pollution and is used to measure the level of organic pollution in wastewater before it is released to a watercourse, with a high BOD indicating more organic pollutants present in the water.

Orthophosphate: A dissolved, inorganic form of phosphorus with the formula PO_4^{3-}. It is the most bioavailable form, meaning plants, including algae, can immediately use it. Therefore, is measured as a good indicator of the risk of eutrophication. Key sources include sewage, fertiliser, and urban runoff.

Total Phosphorous: A measure of all forms of phosphorus within a sample, including both dissolved and particulate, and organic and inorganic. It is a key measurement used to assess water quality and wastewater treatment with sewage, fertilisers, and urban runoff being key man-made sources.

Where a deterioration in water quality is predicted due to increased flows from the Laceby WRC, a variation in the WRC's Environmental Permit to improve the quality of the final effluent and prevent deterioration will be required. This is known as no deterioration load standstill and satisfies the no deterioration requirement of the WFD. As another aim of the WFD is for all surface water bodies to reach good ecological status, this is also considered by the EA when setting or varying permits.

The EA set out the standard framework for the implementation of the requirements and aims of the WFD on inland waters. The following criteria are used to assess the potential impact of development:

Could the development cause a greater than 10% deterioration in water quality?

- This objective is to ensure that all the environmental capacity is not taken up by one stage of development and ensure there is sufficient capacity for future development.
- **Could the development cause a deterioration in WFD status of any element assessed?**
- This is a requirement of the WFD to prevent a deterioration in status of individual contaminants.

Could the development alone prevent the receiving watercourse from reaching good ecological status?

- This is a requirement of the WFD, it assesses whether good ecological status is possible after development.

To assess these three criteria, the EA's SIMCAT model for the Trent has been run for a baseline scenario, a post-development scenario with current technology, and a post-development scenario considering TALs. The criteria are scored based on the scoring system outlined in Table 1, with green assigned where no infrastructure upgrades are required to achieve, amber where infrastructure upgrades within TALs are required to achieve and red where the criteria cannot be achieved within TALs.

6.5.2 Review of EA SIMCAT Trent Model

The EA's water quality river model SIMCAT (Simulation of Catchments) is a crucial tool for setting and reviewing discharge permits at a catchment scale and to quantify the source apportionment of both point and diffuse pollutant load within receiving watercourses. It has been used for calculating the impact of discharges from WRCs at a catchment scale and is often used to determine the permit standards required to meet the WFD's targets and requirements.

The EA provided the Trent SIMCAT model in June 2026. It has been run using SIMCAT v15.7. The EA have confirmed that the model has been calibrated for phosphate at a sub-catchment and water body scale, whereas for Ammonia and BOD the model has been calibrated using auto-calibration techniques at the catchment scale, followed by local checks.

To assess whether the model was fit for purpose at the reach scale, the modelled results were compared to the observed results at the closest downstream water quality point to the Laceby WRC. The modelled and observed mean and 95th percentile values for ammonia, BOD and orthophosphate were compared. The values for ammonia and BOD showed a good level of agreement, however the modelled level for orthophosphate is 170% higher than observed. However, as both values are within the same WFD classification and the modelled value is a conservative estimate, the model has been deemed fit for purpose. Note, whilst modelled results are generated for total phosphorous, observed results are not available.

The SIMCAT model supplied by the EA uses effluent quality values and WFD classifications from 2019. To assess the extent to which these values remain representative of present-day water quality, they have been compared with the 2022 and latest 2025 classifications. As shown in Table 17, the classifications for ammonia and BOD have remained consistent across all three assessment cycles. The SIMCAT model is therefore considered broadly representative of present-day water quality for these parameters.

In contrast, the classifications for orthophosphate differ between each assessment cycle. The 2019 classification represents the worst-case scenario and, consequently, the use of the SIMCAT model results for orthophosphate is considered precautionary.

Table 17 - Changes in WFD Classification of the Laceby Beck/River Freshney Waterbody

Classification	Ammonia	Phosphate	BOD
2019	High	Poor	High
2022	High	Good	High
2025	High	Moderate	High

6.5.3 Review of Technically Achievable Limits (TALs)

Technically achievable limits (TALs) are levels of effluent quality that can be consistently achieved in practice using standard wastewater treatment. It should be noted that they are not theoretical minimum concentrations, especially for sites where pollutant loads from influent are low.

TALs are prescribed for ammonia (95th percentile), BOD (95th percentile) and total phosphorus (mean) but are not for orthophosphate.

Within the SIMCAT model, a mean and standard deviation are provided for each water quality parameter. To allow a comparison of the existing effluent quality to the TALs for ammonia and BOD, a 95th percentile was estimated for the existing effluent concentrations. This was achieved using the

RQP software[47]. It applies Monte Carlo methods, considering the mean, standard deviation, and number of samples before providing an estimate of the relevant percentiles. For the parameters assessed in this study a log-normal distribution was assumed.

The results of this are shown in Table 18. It shows the TAL values to be much lower than the existing effluent concentrations for all three parameters assessed.

Table 18 - Comparison of the Existing Effluent Concentrations in Model and TAL Values for the Laceby WRC

Parameter	Existing Effluent Concentration (mg/l)	TAL values (mg/l)
Ammonia (95th percentile)	3.00	1.00
BOD (95th percentile)	9.82	5.00
Total Phosphorus (mean)	5.20	0.25

6.5.4 Model Results

The SIMCAT model was run for the following three scenarios:

- Baseline – Update effluent flow to the baseline Q80 flow from 2021-2025 (see Table 11).
- Post-development – Update effluent flow to the estimated Q80 flow for 2043 (see Table 11).
- Post-development with TALs – Update the effluent to the estimated Q80 flow for 2043 (see Table 11) and update effluent water quality parameters to match TAL values (see Table 18).

Orthophosphate is insensitive to the application of the total phosphorus TAL, the ratio of orthophosphate to total phosphorus has been calculated for the post-development run (0.793) and multiplied with the total phosphorus result for the post-development TAL run. This provides an estimate of the downstream orthophosphate concentration after application of the TAL. However, it should be noted that the relationship between total phosphorous and orthophosphate is complex. Therefore, the orthophosphate values derived using this method are subject to greater uncertainty.

The results for each run are displayed in Table 19, they are colour coded based on the environmental quality standards applicable to the Laceby Beck watercourse. They are discussed in more detail following the table.

Table 19 - Downstream Water Quality in Laceby Beck/River Freshney

Parameter	BSc (mg/)	Post-Dev (mg/l)	BSc vs Post-Dev %	Post-Dev w/ TALs (mg/l)	BSc vs Post-Dev w/TALs %
Ammonia (90th percentile)	0.518	0.529	+2.12%	0.332	-35.9%
BOD (90th percentile)	2.220	2.350	+5.86%	1.460	-34.23%
Total Phosphorus (mean)	0.727	0.802	**+10.32%**	0.146	-79.92%
Orthophosphate (mean)	0.572	0.636	**+11.19%**	0.116	-79.72%

High
Good
Moderate
Poor
Bad

[47] Environment Agency (2025) *RQP_v6c* https://github.com/DEFRA/rqp-mper/tree/main/executables/Files

Baseline Results

During the baseline scenario, the Laceby Beck/River Freshney watercourse has a *Good* WFD status for Ammonia and a *High* status for BOD. However, for Orthophosphate the watercourse has a *Poor* WFD status.

Post-Development Results

When applying the increased post-development effluent flow from the Laceby WRC, no changes in WFD status are shown to occur within the Laceby Beck/River Freshney. However, the concentrations of all parameters are shown to increase. For ammonia and BOD this increase is limited to 2% and 6% respectively, whereas for total phosphorus and orthophosphate the increase is by 10% and 11% respectively (see Table 19).

Post-Development with TALs Results

The application of TALs at the Laceby WRC results in significant reductions to the water quality concentrations across all parameters assessed. For ammonia and BOD this does not alter the WFD status, however for orthophosphate the application of TALs to total phosphorus results in an improvement in the WFD status from *Poor* in the baseline scenario to *Moderate*.

6.5.5 Review Against WFD Criteria

The model results have been assessed against the WFD criteria and scored. The results are detailed in Table 20. In general it shows that whilst development does lead to a significant deterioration in some water quality parameters, this can be reversed through upgrades within the TALs.

Table 20 - Summary of Modelling Results in Relation to Water Quality Objectives

	Could development cause a greater than 10% deterioration in water quality?	Could development cause a deterioration in WFD Class of any element?	Could development prevent the receiving waterbody from achieving Good Status?
Key	No Infrastructure upgrade required to achieve.		
	Infrastructure upgrade required, but achievable using TALs or by addressing other factors preventing criteria being met.		
	Cannot be achieved using TAL. Environmental capacity could be a constraint on growth.		
Laceby WRC	Predicted deterioration is >10% for orthophosphate and total phosphorous. Deterioration is reversed with TALs.	No WFD class deterioration is predicted.	Receiving waterbody currently has *Good* status for ammonia and *High* status for BOD. This remains in the post-development scenario. In the baseline scenario, orthophosphate has a status of *Poor.* Development has a significant impact (>10%) on its concentration but does not lead to a change in status. Application of TALs leads to an improvement above the baseline and orthophosphate achieving Moderate Status. Development is not considered the single factor preventing *Good* status alone.

6.6 Summary

Four main WRCs have been identified to serve North East Lincolnshire. Of these Immingham, Grimsby-Pyewipe, and Tetney-Newton Marsh have sufficient capacity to facilitate the proposed quantum of development within the Local Plan. In comparison, the Laceby WRC is already at or exceeding its capacity. When considering the development proposed, it is expected to exceed its permit by 18.5%.

Twelve Surface Water Body Catchments are located within the borough of which one classed as *Bad*, one is classed as *Poor*, nine are classed as *Moderate*, and one is a coastal catchment without a WFD ecological classification.

The Laceby WRC discharges to the Laceby Beck/River Freshney WFD waterbody which has an ecological classification of *Poor*. As one of the reasons for it not achieving *Good* status is sewage discharges, it is considered to be significantly vulnerable to increases in discharges from the Laceby WRC. Therefore, the impact of the increased WRC discharges due to development on downstream water quality was assessed using the Trent SIMCAT model.

The results of the water quality modelling show the WFD objectives can be met however infrastructure upgrades within TALs will be required. It should be noted that the current DWF permit for the Laceby WRC as of 2026 has a total phosphorus discharge limit already set to the TAL (0.25 mg/l). Therefore, regarding total phosphorus and orthophosphate, reducing other sources of pollution will also be key in achieving *Good* status. Some of the measures to achieve this should be set out by the EA through liaison with other stakeholders in the Humber River Basin Management Plan[8].

The assessment undertaken to date adopts a precautionary approach and assumes that all development will come forward and be built out. Additionally, the assessment does not take into account any planned or longer-term increases in treatment capacity, which could allow the WRC to store effluent for longer and maintain existing discharge volumes. The TALs applied are based on present day technology and technology may improve over the plan period to 2043. The timing of development will therefore be an important factor.

It is recommended that North East Lincolnshire Council and other stakeholders take the following actions:

- Consider potential impacts on WFD status when assessing planning applications in liaison with the EA and Anglian Water. This is particularly the case for larger scale developments (>500 Dwellings) in the Laceby STW cacthement where current environmental and infrastructural capacity could be a constraint on development.
- Development phasing and early liaison with the EA and Anglian Water should also be key considerations when assessing planning applications for larger-scale developments (>500 dwellings). This is particularly relevant to Laceby STW; however, network constraints may also exist in other locations and should therefore be considered on a site-specific basis at the planning stage.
- Share Annual Monitoring Reports and Housing Land Supply Statements, which detail projected housing development in their administrative area, with Anglian Water.
- Provide a copy of the WCS to neighbouring authorities, Anglian Water and the EA.
- In response to these actions, Anglian Water will need to assess growth demands as part of their wastewater asset planning activities and feedback to the district councils if concerns arise.
- Anglian Water will need to secure relevant planning permissions to upgrade its wastewater facilities. Anglian Water should work proactively with North East Lincolnshire as the Waste Planning Authority to do this.

7 Flood Risk

This section includes a high-level review of the flood risk relevant to this study across North East Lincolnshire, its relationship with the development proposed, and how it might be managed moving forward.

7.1 Fluvial/Tidal Flood Risk

Within North East Lincolnshire, the main watercourses affecting fluvial flood risk are the Laceby Beck, Buck Beck, and Waithe Beck, as well as their upstream tributaries, see Figure 20. Fluvial flood risk is present along main rivers (which are the responsibility of the EA) and ordinary watercourses (which are the responsibility of North East Lincolnshire Council acting as the Lead Local Flood Authority, and riparian owners).

Tidal flood risk affects large areas of the low-lying land in the east of the borough which lies adjacent to the Humber Estuary. As shown in Figure 20, the area of tidal flood risk reaches over 3 km inland in some places covering the two major settlements within the borough of Grimsby and Cleethorpes. This extent increases further when considering climate change and the associated sea level rises.

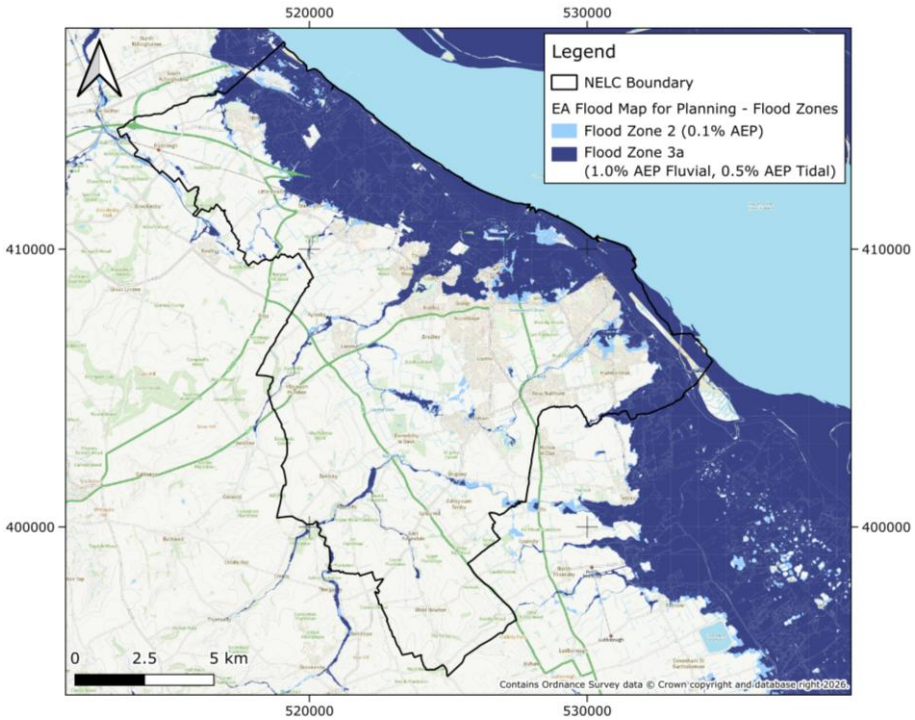

Figure 20 - EA Flood Map for Planning Flood Zones

However, it should also be noted that along the entire coast and many of the watercourses in the east/northeast of the borough are engineered flood defences including embankments, engineered

high ground, flood gates, demountable defences, and flood walls. These significantly reduce the present-day flood extents across the borough, see Figure 21.

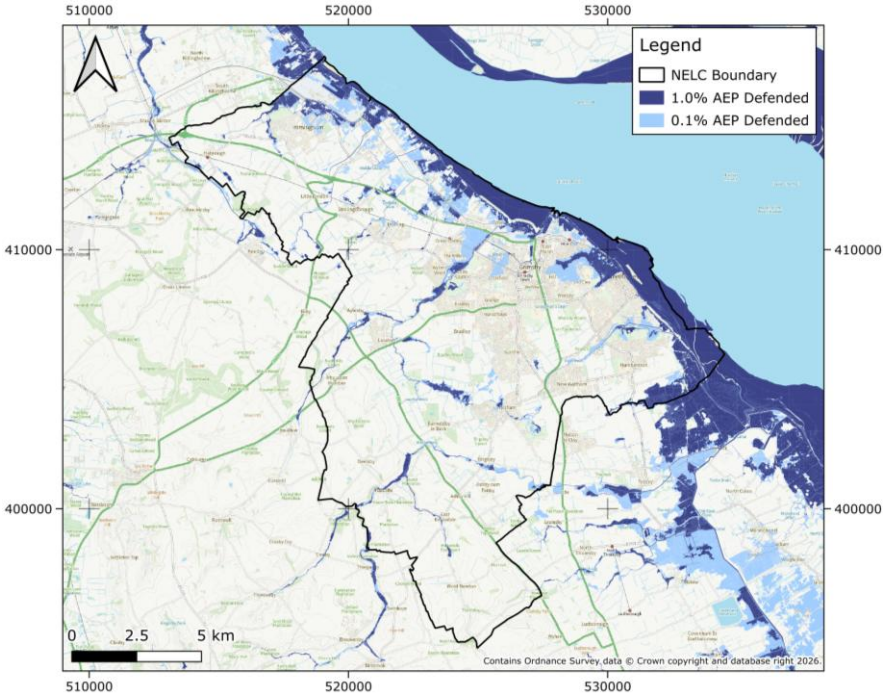

Figure 21 - EA Flood Map for Planning Defended Flood Extents

7.2 Surface Water Flood Risk

Surface water flooding affects many areas across the borough. It is particularly widespread in the lower lying areas of the borough in the east, north and centre. This is likely due to the higher proportion of impermeable surfaces and shallower topographic gradients compared to the rural west and south of the borough. In the west and south, surface water flood risk is mainly isolated to the bottom of valleys in the topography.

7.3 Sewer Flood Risk

Sewer flooding often occurs when intense rainfall overloads the sewer system capacity (surface water, foul or combined), and/or when sewers cannot discharge properly to watercourses due to high water levels. Groundwater flooding can also contribute to sewer flooding through groundwater infiltration, where groundwater finds its way into the sewer system and contributes to its overload. Sewer flooding can also be caused when problems such as blockages, collapses or equipment failure occur in the sewerage system.

Anglian Water have provided a register for sewer flooding incidents recorded in North East Lincolnshire. A total of 558 sewer flooding incidents were recorded between 2005 and 2026 of which, 449 were external to a property and 109 were internal. Figure 22 shows the geographical distribution

of these recorded events. It highlights the majority of sewer flood events occurred in Grimsby Town Centre, The Willows, and Waltham. A comparatively small number of events were recorded in Cleethorpes, as Figure 22 shows it to have fewer flood events than either Laceby or Healing which have much smaller populations.

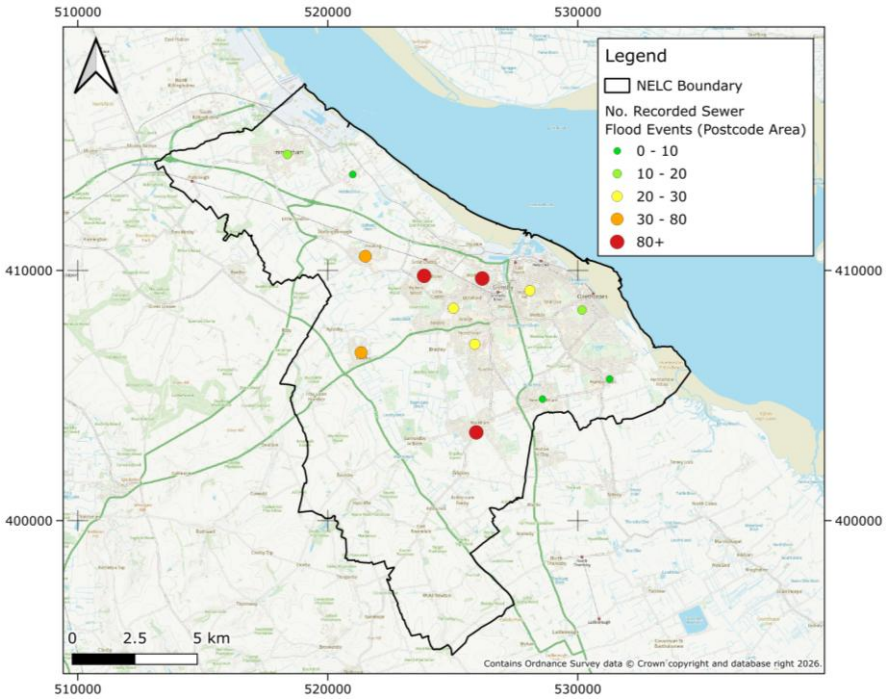

Figure 22 - Recorded Sewer Flooding Events Grouped by Postcode Areas

7.4 Impacts of Development

Development, if not properly managed, has the potential to impact a wide range of flood risk mechanisms. Land use changes influence the ways in which rainwater runs off land into local water networks such as drains, streams and rivers. Where many localised changes in land use occur collectively across a catchment, their cumulative changes to the baseline environment can cause detrimental impacts downstream on a catchment-wide scale.

The main method by which development changes the baseline hydrological regime is through the replacement of greenfield land with impermeable surfaces. This occurs across all forms of development including strategic developments, windfall development, and urban creep. Increasing the area of impermeable surfaces, increases the volumes and rates of surface water runoff following a rainfall event. On a catchment-wide scale, this can reduce the time between rainfall events and their corresponding peak flood levels in downstream watercourses. This has the potential to produce flood events of a greater magnitude and increases the difficulty of providing effective flood responses. Increases in impermeable surface areas within a catchment can increase the risk of both fluvial and surface water flooding.

Development may also result in the loss of floodplain area, reducing the storage capacity of a floodplain. This can have detrimental impacts on both neighbouring land and downstream areas. Whilst the construction of new developments on greenfield land is one cause of this, changes to a building's footprint and raising ground levels can also result in a loss in floodplain storage and floodwater conveyance.

Increased development may also contribute to sewer flooding by increasing the area of land draining to the sewer network. If its capacity is not managed, the sewer network can become overloaded and surcharge. Several areas within the borough have been identified as being at risk of sewer flooding, see Figure 22. Therefore, increased inflows to the sewer network from developments has the potential to increase the number of flood events experienced.

An indirect impact of development on fluvial flood risk is increased discharges from WRCs due to changes to their discharge permits. Though this is often not considered to be a significant contributor to flood risk as WRC discharges are generally much smaller than flood flows within watercourses. Where WRCs drain to small streams this may be a concern. Within North East Lincolnshire, three of the major WRCs drain to the Humber Estuary whilst one other major WRC drains to a significant watercourse (Laceby Beck). Therefore, flood risk from increased flows is not considered to be a concern.

7.5 Impacts of Climate Change

Climate change is the long-term shift to weather and temperature patterns, which since the industrial revolution, have been caused by increased greenhouse gas emissions to the atmosphere from burning fossil fuels. In relation to flood risk, climate change has the potential to increase the frequency and severity of rain storms and raise sea levels through thermal expansion and the melting of ice on land.

The EA Flood Map for Planning shows the predicted increases in flood risk due to climate change up to the 2080s epoch (2070-2125) for fluvial flooding and up to 2125 for sea level rise, see Figure 23. Due to the low-lying land and proximity to the Humber Estuary, the north and east of the borough is most at risk from sea level rise due to climate change. Smaller changes in extent are shown for the fluvial flood extents. The design standard of protection along much of the coastal defences is the 1 in 200yr event. Therefore, these defences may be overtopped when considering sea level rise uplift.

Though the Local Plan only extends to 2043, the properties built within this time will be expected to have a lifetime far beyond this. Therefore, an allowance for climate change should also be included when assessing the impacts of development on flood risk and vice versa.

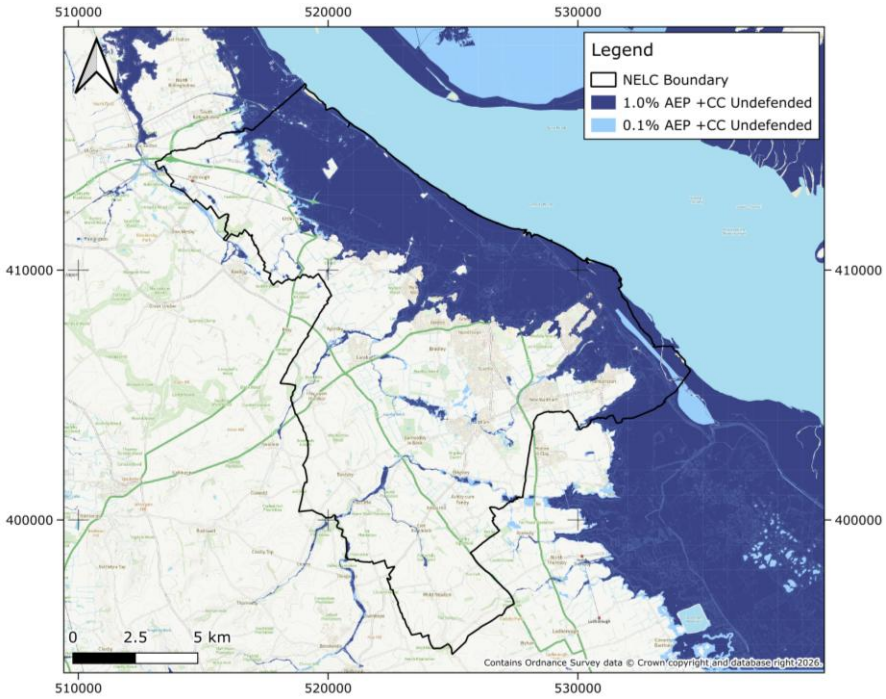

Figure 23 - EA Flood Map for Planning Climate Change

7.6 Mitigation Options

Flood risk is a key factor in spatial planning. Government policy seeks to ensure that all developments are safe with respect to flooding, and that floodplains are used for their natural purposes.

Through the application of the National Planning Policy Framework (NPPF)[48], a sequential approach will be applied to the allocation of sites in the Local Plan to steer development towards areas with the lowest probability of flooding. Development should not be allocated or permitted if there are reasonably available sites in areas with a lower probability of flooding. If following this exercise, sites need to be allocated in at risk areas, an Exception Test is typically required. To pass the Exception Test, a development must remain safe for its lifetime, without increasing flood risk elsewhere, and, where possible, reduce flood risk overall. This should consider the vulnerability of the site's users.

Development brought forward through the Local Plan, though will be sited outside of floodplain areas where possible, has the potential to exacerbate flood risk due to increased runoff from impermeable surfaces and land use changes. To accommodate such changes, mitigation options are likely to be

[48] Ministry of Housing, Communities and Local Government (2025) *National Planning Policy Framework* https://www.gov.uk/government/publications/national-planning-policy-framework--2

required at several sites to facilitate development, ensuring it is both safe for users and does not increase third-party flood risk elsewhere. Options to be considered include:

- Sustainable Drainage Systems (SuDS) guidelines to achieve no net increase in runoff because of the development proposals (obligatory for most development sites).
- Developer contributions to fund local improvement schemes elsewhere.
- Flood resilient and resistant building design.
- Flood incident management (flood warning) and emergency planning.
- Opportunities for SuDS at locations where there is mutual benefit to reduce overall flood risk to new and existing developments.
- Increase floodplain storage/provide compensatory storage should a development require any ground raising above measured/modelled flood levels.

SuDS are key to ensuring development does not increase runoff rates and volumes, as they are designed to manage stormwater as close to its source as possible to mimic natural drainage, and encourage infiltration and attenuation. SuDS also help to improve and maintain water quality through passive treatment methods.

The National Standards for SuDS[49] published by DEFRA (2025), sets out the standards for SuDS systems in England and provides key information for designers, property developers, local authorities and other interested parties, such as sewerage undertakers and the EA. As the LLFA, North East Lincolnshire Council provide guidance on the use of SuDS within the borough through their Strategic Flood Risk Assessment (2022)[50] which was developed in partnership with North Lincolnshire Council and the EA.

In managing stormwater locally through infiltration and attenuation, SuDS also have the potential to reduce the amount of surface water runoff entering the sewer network and thereby sewer flood risk overall. They also have the potential to treat and enhance water quality. Both facets will be key in managing the infrastructural and environmental capacity in the borough. Furthermore, reducing the runoff entering sewers can help to reduce the number of spills from CSOs by reducing and delaying the volume of water reaching the WRC storm tanks. Upgrades to the storm tanks at WRCs would also allow more water to be stored at WRCs, ensuring it is treated and discharged when water levels return to a normal range. Another method to reduce storm overflows includes remote sensors and smart technology installed to monitor and redistribute water within the sewer network to reduce the potential for sewer flooding and CSO spills.

When considering sites in the Local Plan and windfall sites, any developer is encouraged to work with the Anglian Water early in the planning process to understand what infrastructure is required, in addition to where, when and how it will be delivered. Urban creep and climate change will also need to be considered in any liaison to ensure the infrastructure upgrades implemented are resilient going forward. During the plan period, mitigation measures may also be implemented at the catchment wide scale (typically by the EA or LLFA). This may include natural flood risk management (NFM), river engineering, wide scale sewer network upgrades, rural land management upstream, urban

[49] DEFRA (2025) *National standards for sustainable drainage systems (SuDS)* https://www.gov.uk/government/publications/national-standards-for-sustainable-drainage-systems/national-standards-for-sustainable-drainage-systems-suds
[50] North East Lincolnshire Council and North Lincolnshire Council (2025) *Strategic Flood Risk Assessment.* https://www.nelincs.gov.uk/planning-and-building-control/planning-policy/local-plan-background-information/strategic-flood-risk-assessment/

design, coastal flood protection, and flood defence infrastructure. These mitigation measures have the potential to reduce flood risk for both new and existing development.

7.7 Summary

Both the impact of development on flood risk, and the impact of flood risk on development can be reduced by ensuing development follows the Sequential and Exception Tests outlined in the NPPF and the national and local standards for SuDS.

In line with the NPPF, it is also recommended that where possible development should reduce overall flood risk. Methods to achieve this can include creating flood storage areas, establishing wetland features, promoting vegetation growth, and the use of NFM practices. Alongside these site scale measures; catchment scale measures may help reduce flood risk in the borough. A reduction in flood risk could also be supported by a direct financial contribution from developers to wider flood risk management infrastructure through section 106 agreements or a community infrastructure levy.

It is also integral that local sewer upgrades are in place prior to development to safeguard against increased surface water and sewer flood risk. The specific upgrades required to the sewer network in response to development are likely to require further technical work by Anglian Water in collaboration with developers.

The assessment of flood risk undertaken to date through this study is high level. A detailed assessment is provided within the Strategic Flood Risk Assessment.

8 Other Environmental Constraints

8.1 Protected Sites

Further environmental constraints arise mainly from the protected status of sites across the borough. Any developments that are close to or within the boundary of a designated site such as a Special Area of Conservation (SAC), Special Protection Area (SPA), Site of Special Scientific Interest (SSSI), or RAMSAR sites, may require a Habitat Regulations Assessment (HRA) if they could significantly harm the designated features of the site. This includes watercourses located within the borough, which may be hydrologically connected to protected sites. An initial screening stage would be required, followed by an appropriate assessment if needed. The HRA process is focused on protecting the qualifying features of designated sites.

Where it is considered that an adverse effect on the integrity of the protected site is likely, and no alternatives are available, the project can only go ahead if there are imperative reasons of over-riding public interest and if the appropriate compensatory measures can be secured. Planning authorities can also insist that developments carried out without necessary planning permission are removed.

Often protected sites play a key function in terms of water quality which is vital for maintaining the environmental capacity across the borough. If development is not properly managed, it could lead to a deterioration in water quality or changes in the flow regime at protected sites. Care needs to be taken both during and after construction to ensure that runoff from development sites is adequately treated before entering the local drainage network. This will in turn safeguard environmental capacity and allow for further development to be delivered sustainably. Many protected sites carry multiple overlapping designations to reflect various interests which operate at different legislative scales.

8.1.1 Special Areas of Conservation

SACs are strictly protected sites designated under the European Union's Habitats Directive. In North East Lincolnshire the only site designated as an SAC is the Humber Estuary. As almost the whole borough eventually drains to the Humber Estuary, the potential impacts of development upon it will need to be considered.

8.1.2 Special Protection Areas

SPAs are closely linked to the designated of SAC's but are designated on the basis of rare and vulnerable bird species. The Humber Estuary is also designated as a SPA. There are no other SPA sites within the borough.

8.1.3 Site of Special Scientific Interest

A SSSI is a formal conservation designation, recognised for its biological or geological importance. Usually, it describes an area that is of particular interest to science due to the rare species of fauna or flora it contains (Biological SSSI) or important geological or physiological features that may lie in its boundaries (Geological SSSI)

Local planning authorities are required to have policies in their development plans that protect SSSIs. They are also required to consult the appropriate conservation body over planning applications which might affect the special interest of a SSSI. The landowners of SSSIs are also required to obtain consent from the relevant nature conservation body if they want to permit potentially damaging activities.

Within North East Lincolnshire, the only SSSI is the Humber Estuary, it is classed as a biological SSSI. The Humber Estuary is also designated as a RAMSAR site which are wetlands of international importance designated under the Ramsar Convention.

The biological SSSI of Tetney Blow Wells lies outside of the borough but is hydrologically connected to it via Waithe Beck. Therefore, proposed development draining to the Waithe Beck may need to consider Tetney Blow Wells SSSI within their planning application. Swallow Wold is a biological SSSI also located just outside of the borough, however unlike the Tetney SSSI, it lies upstream of the borough and is not though to be hydrologically connected.

Figure 24 shows the designated sites within and near to the borough border.

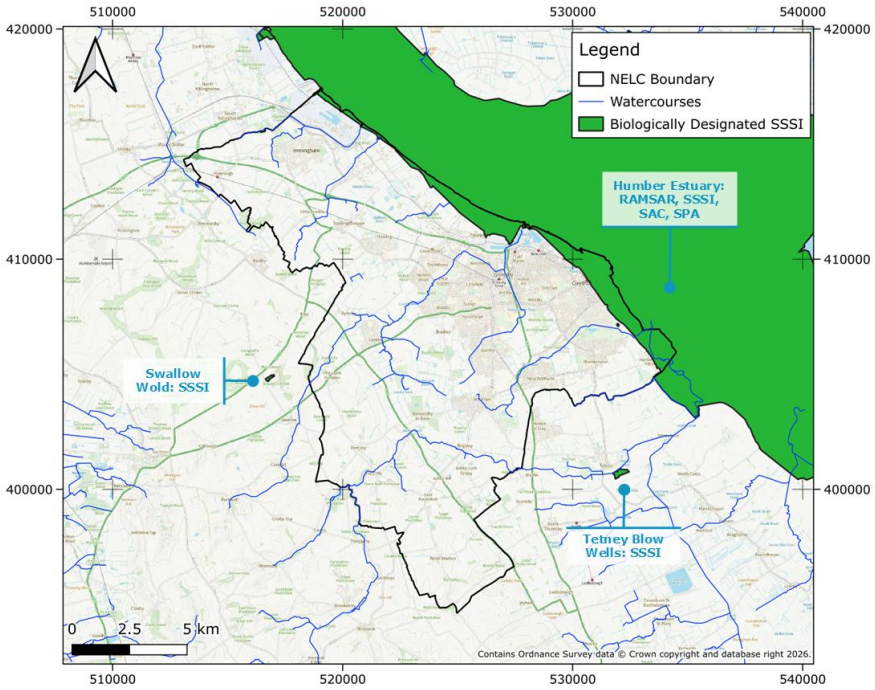

Figure 24 - SSSIs Within and Surrounding North East Lincolnshire

8.2 Odour Risk

WRCs and other wastewater sites, like pumping stations and storm tanks, can be odour sources. Often, they were originally built a significant distance away from urbanised areas; however, population growth means these once remote sites are now potential locations for development.

Anglian Water have published guidance[51] for proposed development near WRCs. They encourage early engagement with developers regarding encroachment issues and recommend consultation prior to the submission of planning applications. In general, Anglian Water employ a risk-based methodology to assess odour risk from WRCs, based on the population served and the development's proximity to the site, see Table 21. Any development falling within the 'amber' or 'red' categories requires further investigation due to potential odour risk or impacts on WRC operations.

Table 21 - Anglian Water WRC Odour Encroachment Risk Assessment Methodology[51]

Population Served by WRC	Distance from Proposed Development from WRC (m)						
	50	100	150	200	250	300	400
0 - 1,000							
1,001 - 2,500							
2,501 - 5,000							
5,001 - 10,000							
10,001 - 50,000							
50,001 - 100,000							
>100,001							

Figure 25 shows the locations of WRCs in and around North East Lincolnshire with buffer zones to achieve a green classification in Table 21 applied based on the number of people they serve. Where the population served by the WRC is greater than 5000, a conservative 800 m buffer has been applied. Most WRCs are located in rural areas with very few, if any, buildings located within their buffer zones. However, the Immingham and Grimsby-Pyewipe WRCs are located in more urban settings. The buildings affected are primarily industrial, however a small number of existing residential dwellings are located on the edge of the Grimsby-Pyewipe 800 m buffer zone. In terms of the proposed local plan allocations, a small number of employment allocations overlap the Immingham buffer.

For sites located within the buffer zone of a WRC, odour risk could be a concern and should be assessed before the planning application stage. This will enable issues to be identified and resolved where possible, meaning fewer delays at the planning and construction stages. Where odour risk is a concern, developers may be required to submit an odour modelling assessment, in consultation with Anglian Water. Where mitigation is required, the developer must fund this, however it can be costly to reduce and treat odour. Measures include increased maintenance of plant and equipment,

[51] Anglian Water (2023) *Asset Encroachment Risk Assessment Methodology: Guidance Document* https://www.anglianwater.co.uk/siteassets/household/new-report/aws-asset-encroachment-risk-assessment-methodology-sm.pdf

covers for tanks, the use of enclosure and venting, and end of pipe treatments (i.e. dilute, disperse or abatement). The locations of other sewer assets, like pumping stations, should also be considered at the planning stage for their amenity and odour risk.

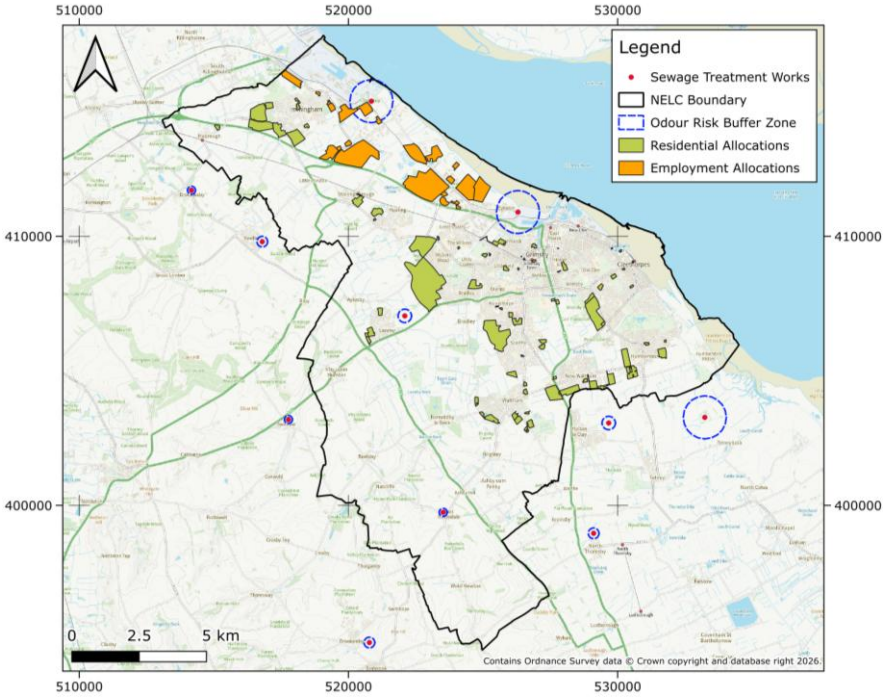

Figure 25 - WRC Odour Risk Buffer Zones

8.3 Summary

The only protected site within the borough is the Humber Estuary. However, as all sites drain to it, impacts upon it by developments may need to be considered given its internationally important habitat. This is likely to be done through Environmental Impact Assessments (EIAs) and HRAs at the planning application stage.

When assessing odour risk to the proposed development sites, no residential developments are located within a WRC buffer zone, however three employment allocations are located at least partially within the Immingham WRC buffer zone. These sites are allocated for green energy development and so are unlikely to be significantly affected by odour from the WRC.

9 Conclusions and Recommendations

Water Resources and Supply

Conclusions

- Anglian Water's baseline forecast for the Lincolnshire East WRZ indicates there could be shortfalls in water supply up to 2043 and beyond due to increased demand and reduced supply to ensure a sustainable abstraction balance is reached.
- The total number of dwellings within the North East Lincolnshire Local Plan 2043 is likely to be greater than assumed in the Anglian Water WRMP24. It is estimated that the Local Plan proposes 33% more dwellings than assumed within the WRMP24.
- The risk this poses is greatest early in the plan period before publication of the next WRMP scheduled for 2029. The WRMP 2029 should factor in the additional growth proposed in North East Lincolnshire and the latest growth figures from other areas.
- In their current WRMP 2024 Anglian Water have identified several demand management options including smart metering, improvements in both household and non-household water efficiency, and reduced leakages.
- On the supply side, Anglian Water propose advanced effluent treatment, backwash recovery, desalination, and groundwater and surface water abstraction enhancements. These supply-side options provide a greater increase in supply than the reductions in demand, however they are associated with significant lead in times.
- The demand options are available from the beginning of the plan period and will be integral during the early part of the plan period to ensure a supply demand balance due to the significant lead in times required for the supply side options.
- By incorporating these demand management and supply-side options, Anglian Water expect to balance supply and demand by the end of the plan period (2043).
- Stricter water efficiency policies for both household and non-household properties are likely to be required within the Local Plan to support the supply-demand balance in the early plan period.
- The assessment is subject to uncertainty, particularly regarding, i). the extent to which WRZ-level forecasts reflect conditions in North East Lincolnshire; and ii). the effects of development above current projections.
- Further technical work would be required to refine North East Lincolnshire-specific forecasts and quantify any future deficits. This should be addressed with future WRMP updates which are expected to incorporate more recent Local Plan evidence and provide a more robust assessment of future water resource pressures.
- Anglian Water are best placed to assess future supply-demand impacts and infrastructure requirements, with network upgrades requiring further assessment as development sites come forward through the planning process.

Recommendations

- Anglian Water will continue its responsibilities in upgrading and providing water supply for new developments without presenting a risk to the environment.
- Anglian Water will need to assess future development earmarked in the Local Plan when developing their upcoming WRMP2029.
- The EA will need to review and provide feedback on Anglian water's WRMP2029, ensuring that Anglian water address future water needs and provide a secure and sustainable water supply to the borough.
- The EA will continue to regulate the abstraction of water from rivers and other sources in the borough, ensuring it is sustainable and within legal limits.

- It is recommended that developers engage with Anglian water as early as possible so they can undertake modelled impact assessments to confirm if specific water supply upgrades are required and when. This is particularly the case for developers of heavy water use industries attracted by the Humber Estuary.
- Should strategic infrastructure upgrades be required to supply new development, the option to phase some of the dwellings to later in the plan period should be considered, especially for larger scale residential developments.
- It is recommended that the council consider a policy on water efficient design, looking at reaching higher levels of water efficiency for new development beyond the 110 l/p/d currently implemented and potentially below 100 l/p/d. This will help mitigate water resource challenges early in the plan period and, alongside new supply sources, reduce the risk of additional pressures in the future.
- For non-household development, it is recommended that local plan policy requires a minimum of 3 credits under the BREEAM New Construction Standard measure "Wat01".
- New non-household users should also engage with Anglian Water and retailers at the planning stage to ensure sufficient water supply is available to facilitate the proposed development.
- The council will provide Anglian Water with their Annual Monitoring Reports and Housing Land Supply Statements, which outline projected development within their administrative area.

Wastewater Infrastructure, Water Quality and Environmental Capacity

Conclusions

- Four main WRCs serve North East Lincolnshire: Immingham, Grimsby-Pyewipe, Tetney-Newton Marsh and Laceby.
- Immingham, Grimsby-Pyewipe and Tetney-Newton Marsh have sufficient capacity to accommodate the proposed Local Plan development.
- Laceby WRC is already at or above capacity and is expected to exceed its permit by 18.5% with the proposed development.
- There are 12 Surface Water Body Catchments within the borough, 1 is classified as Bad, 1 classified as Poor, 9 are classified as Moderate and 1 is a coastal catchment with no WFD ecological classification.
- Three of the main WRCs discharge to the Humber Lower TraC waterbody which has a moderate ecological classification with no reasons for not achieving good status attributed to the water industry.
- Laceby WRC discharges to the Laceby Beck/River Freshney WFD waterbody, which is currently classified as Poor.
- Sewage discharges are one of the reasons the waterbody is not achieving Good status, making it particularly vulnerable to increased discharges from Laceby WRC.
- The potential impact of increased discharges from planned development was assessed using the Trent SIMCAT water quality model.
- Modelling indicates that WFD objectives can be achieved, but infrastructure upgrades within the TAL limits will be required.
- The current 2026 DWF permit for Laceby WRC already sets the total phosphorus discharge limit at the TAL of 0.25 mg/l. Consequently, achieving Good status for total phosphorus and orthophosphate will also require reductions in other sources of pollution.

Recommendations

- Consider potential impacts on WFD status when assessing planning applications in liaison with the EA and Anglian Water. This is particularly the case for larger scale developments (>1000 Dwellings) where current environmental capacity could be a constraint on development.

- Development phasing and liaison with the EA and Anglian Water should also be a key consideration when assessing planning applications for larger scale developments especially in the Laceby STW catchment.
- Share Annual Monitoring Reports and Housing Land Supply Statements, which detail projected housing development in their administrative area, with Anglian Water.
- Provide a copy of the WCS to neighbouring authorities, Anglian Water and the EA.
- In response to these actions, Anglian Water will need to assess growth demands as part of their wastewater asset planning activities and feedback to the district councils if concerns arise.
- Anglian Water will need to secure relevant planning permissions to upgrade its wastewater facilities. Anglian Water should work proactively with North East Lincolnshire as the Waste Planning Authority to do this.

Flood Risk

- Development has the potential to impact on a wide range of flood mechanisms including fluvial, surface water, and sewer flooding.
- Due to the low-lying land and proximity to the Humber Estuary, the north and east of the borough is most at risk from sea level rise due to climate change. The design standard of protection along much of the coastal defences is the 1 in 200yr event. Therefore, upgrades to these defences is likely to be required to ensure the borough remains protected from the effects of climate change.
- Both the impact of development on flood risk, and the impact of flood risk on development can be reduced by ensuing development follows the Sequential and Exception Tests outlined in the NPPF and the national and local standards for SuDS.
- Ensuring local sewer upgrades are in place prior to the occupation of development will safeguard against surface water and sewer flood risk impacts.
- The SFRA for the borough includes a more detailed assessment of flood risk constraints.

Other Environmental Constraints

- The Humber Estuary is the only designated site within the borough; however, it is designated as an international important habitat under the RAMSAR convention.
- Further work at the planning application stage including EIAs and HRAs may be required to assess the impacts of developments upon the Humber Estuary as all sites within the borough drain to the estuary.
- No residential sites are located within the odour risk buffer zones of the WRCs, however three employment sites, allocated for green energy, are located within the Immingham WRC buffer zone. These are not expected to be significantly impacted by odour risk.
- If odour risk is identified as a concern for a site, the developer should contact Anglian Water prior to submitting a planning application.