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DRAFT DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP) 331001729-01-02

DRAFT STRATEGIC ENVIRONMENTAL ASSESSMENT – ENVIRONMENTAL REPORT

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ABBREVIATIONS

Abbreviations used:	
AMP	Asset Management Plan (AMP7 period is 2020-2025)
AONB	Area of Outstanding Natural Beauty
AQMA	Air Quality Management Area
BNG	Biodiversity Net Gain
BRAVA	Baseline Risk and Vulnerability Assessment
CU	Coastal Urban
Defra	Department for Environment, Food and Rural Affairs
DSMP	Drainage and Sewerage Management Plan
DWF	Dry Weather Flow
DWMP	Drainage and Wastewater Management Plan
EPA	Environmental Performance Assessment
GhG	Greenhouse Gas
HRA	Habitats Regulations Assessment
HU	Historic Urban
INNS	Invasive non-native species risk assessment
IU	Industrial/ Economic Urban
L1/ L2/ L3	Level 1/ Level 2/ Level 3
LLFA	Lead Local Flood Authority
LR	Lowlands Rural
MCZ	Marine Conservation Zone
NCA	National Character Area
NIDP	Northumbria Integrated Drainage Partnership
NNR	National Nature Reserve
NWG	Northumbrian Water Group
ODA	Option Development and Appraisal
OFWAT	Water Services Regulation Authority

PO	Planning Objective
PR24	2024 Price Review
PRoW	Public Rights of Way
RBCS	Risk Based Catchment Screening
RBD	River Basin District
RNAGS	Reason for Not Achieving Good (Ecological) Status
SAC	Special Area of Conservation
SEA	Strategic Environmental Assessment
SF	Suburban Fringe
SO	Storm Overflow
SOAF	Storm Overflow Assessment Framework
SODRP	Storm Overflow Discharge Reduction Plan
SPA	Strategic Planning Area (note SPA sometimes also refers to a 'Special Protection Area', but in this report we have not abbreviated the term Special Protection Area)
SPG	Strategic Planning Group
SPZ	Source Protection Zone
SSSI	Site of Special Scientific Interest
SuDS	Sustainable Drainage System
TPU	Tactical Planning Unit
uFMfSW	updated Flood Map for Surface Water
UK	United Kingdom
UKCP	UK Climate Projections
UR	Uplands Rural
WFD	Water Framework Directive
WHS	World Heritage Site
WwTW	Wastewater Treatment Works

NON-TECHNICAL SUMMARY

This non-technical summary provides an overview of the Strategic Environmental Assessment (SEA) of Northumbrian Water Group's (NWG) new draft Drainage and Wastewater Management Plan (DWMP). It summarises the key issues using non-technical language as far as possible to make the report more accessible. For the full findings, reference should be made to the SEA report.

SEA provides an opportunity to consider ways by which the plan can contribute to improvements in environmental conditions; as well as a means of identifying and mitigating any potential adverse environmental effects that the plan might otherwise have. It informs the decision-making process through the identification and assessment of significant and cumulative effects a plan or programme may have on the environment. By doing so, it helps make sure that the proposals in the plan are the most appropriate given the reasonable alternatives. The SEA process is conducted at a strategic level and enables consultation on the potential effects of a plan with a wide range of stakeholders. This assessment has been undertaken as best practice, rather than a statutory requirement.

NTS 1.1 Overview of the Plan

The DWMP sets out the long-term investment plan for drainage and wastewater, defining priorities for investment over the next 40 years. It will inform the company business plan submission for PR24 (Price Review 2024) ahead of Asset Management Plan (AMP) 8 for the period 2025 – 2030. Key performance targets for the plan are to:

- achieve the expected Storm Overflow (SO) targets (which are due to be confirmed in September 2022);
- achieve NWG's Ambitious Goal of zero internal property sewer flooding by 2040; and
- ensure that all wastewater treatment works (WwTWs) are complaint with their Dry Weather Flow (DWF) treated effluent consent values.

Scope

The Study Area aligns with the operational boundary for NWG's provision of wastewater services (see **Figure 1.2.1** of the SEA Report). The DWMP considers wastewater and drainage networks (foul, combined and surface water sewers), interconnecting drainage systems (such as highway drains and culverted watercourses), wastewater pumping stations, and wastewater treatment works systems looking at a combination of flooding and environmental impact.

Working in Partnership

NWG recognises that to get the best outcomes for all in the region, it needs to work collaboratively with customers and all organisations who have an interest in the issues. NWG has worked with various stakeholders throughout the development of the plan, including the Environment Agency, Lead Local Flood Authorities, Local Planning Authorities, Developers and Environmental Partners. In addition, in Autumn 2020, NWG engaged with customers through a series of interactive tasks and activities regarding the DWMP. The results from this research have helped shape the plan.

The DWMP has been developed in line with Water UK's: 'A framework for the production of Drainage and Wastewater Management Plans'[1].

NTS 1.2 Stages of the SEA and Consultation

The SEA Scoping Report was the first stage of the SEA. It established the context of the plan (the legal, policy and other requirements; the current environmental, social and economic conditions, problems and trends) and proposed the SEA methodology, including SEA Objectives.

The consultation bodies (Natural England, the Environment Agency, and English Heritage), along with wider consultees, were consulted on the Scoping Report for a period of five weeks from 17th January 2022 to 21st February 2022. Feedback received during consultation has informed the SEA process.

This SEA Environmental Report is issued for consultation for 12 weeks along with the draft DWMP, including to the SEA consultation bodies. The draft DWMP and associated documents including the SEA, are available to view and download free of charge from www.nwl.co.uk/dwmp. Responses should be provided via this weblink by **23rd September 2022**.

Feedback received during the consultation will inform the development of the final DWMP and associated SEA Environmental Report, which are due to be completed in March 2023.

NTS 1.3 Key Requirements, Issues and Opportunities

As part of the SEA, relevant plans, programmes and environmental protection objectives relevant to the DWMP were identified, along with the baseline environment and likely future without the plan. These are summarised within **Tables 2.2.1 and 3.2.1**.

A key change since the Scoping Report is the publication of Defra's Consultation on the Government's Storm Overflow Discharge Reduction Plan[2] (the 'SODRP consultation') on 31 March 2022, aiming to eliminate all harm from storm overflows in the long-term. The consultation sets out three target areas for compliance relating to SO discharge: to cause no local adverse ecological impact, reducing harm near designated bathing waters, and limiting the number of discharges.

Climate change and population growth are key factors which are increasing pressure on the wastewater system (and the wider environment), including increased flood risk, a trend which is expected to continue.

These are key issues in relation to water quality, flood risk, biodiversity and human health, which the plan seeks to address.

[1] Water UK (2021) DWMP Framework Guidance, available from: https://www.water.org.uk/wp-content/uploads/2021/10/DWMP_Framework_Report_Main_Report_September_2021.pdf, accessed March 2022.
[2] Defra (2022) Consultation on the government's storm overflows discharge reduction plan (defra.gov.uk), accessed May 2022.

NTS 1.4 How was the plan assessed?

SEA objectives were developed to state the direction and priorities of the SEA; give a structure to ensure a comprehensive and robust appraisal; and provide the basis for the identification of relevant indicators. They are:

Table NTS 1 – SEA Objectives

SEA Topic	Overarching SEA objectives
Biodiversity and Geodiversity	Protect, conserve, and enhance biodiversity and geodiversity, including soils
Human Health	Protect, conserve, and enhance human health and well-being, including resilient communities
Socio-economic	Protect, conserve, and enhance social and economic prosperity
Carbon & Material Assets	Address the causes of climate change and manage and improve efficient use of resources, including embodied carbon, carbon emissions, emissions to air and waste generation
Water Resources	Protect, conserve, and enhance water resources
Flood Risk	Reduce and manage flood risk, increasing flood resilience
Heritage	Protect, conserve, and enhance the historic environment, including archaeology
Landscape	Conserve, protect and enhance the landscape, townscape, and visual amenity
Climate Change Resilience	Adapt, and improve resilience to climate change

The SEA objectives are developed further into an SEA framework, including guiding questions, that has been used to assess if the plan, the components of the plan, and their reasonable alternatives are likely to bring positive, negative, neutral, or uncertain effects in relation to the SEA objectives. Consideration is given to the likely significance of identified effects in accordance with Schedule I to the SEA Regulations.

The SEA process is concerned with likely significant effects, including the measures envisaged to prevent, reduce, and as fully as possible offset any significant adverse effects of implementing the plan. For the purposes of this appraisal, a significant negative assessment (indicated by a 'red' score within the appraisal matrix) is considered to be a significant adverse effect; where the option is implemented by the plan, measures will be required to prevent, reduce, and offset the significant adverse effects.

It is important to note that the assessment has been undertaken at the strategic level, in line with the nature of SEA and the DWMP. There will naturally be variation in the effects of the plan across the plan area as the receiving environment and the implementation of options vary.

NTS 1.5 Option development and assessment

The DWMP has been produced following a risk and benefits-based approach, following the guidance provided in the DWMP Framework. The criteria considered within this process (such as bathing waters, sewer flooding, storm overflows, population growth) provide a good coverage of the SEA topics, particularly in relation to water resources, flood risk, climate resilience and biodiversity – reflecting the nature of the plan and its

objectives for flood risk, the (water) environment and compliance. There is less consideration of carbon and material assets through the assessment, than for other SEA topics. This is an area which could be developed further within subsequent iterations of the plan. Overall, the SEA topics are well covered within the DWMP development process, demonstrating integrated consideration of the SEA themes throughout the plan production.

The options considered as part of the DWMP have been reviewed through the SEA to ensure all reasonable alternatives have been considered. The options considered are management options (influencing customer behaviour, smart networks, working in partnership), green options (catchment management, blue/ green corridors, sustainable drainage systems and traditional / grey options (new surface water sewers, below-ground storage, flow transfer, WwTW rationalisation, SO rationalisation). These options have been appraised using the SEA framework both at plan wide and Level 2 (L2) (see **Tables 5.3.1, 5.3.2** and **5.4.1**), with most options being implemented on a Level 3 (L3), or Level 4 (L4) basis (typically a wastewater treatment catchment scale) with findings used to inform the development of the DWMP.

In addition to these options, NWG have considered a hybrid green/ grey approach of Surface Water Management within catchments, which would be achieved through the combination of several of these options:

- Catchment management
- Blue/ green corridors
- Sustainable Drainage System (SuDS) features
- Short sections of new surface water sewers

NTS 1.6 Overview of the Draft DWMP

NWG have selected the 'best value' (rather than the 'least cost') approach for each catchment to achieve the key performance targets of the plan (set out above).

Considering each of these targets, where measures are required to achieve the expected **SO targets**, below-ground storage has been identified as the best value option within 689 Level 4 (L4) drainage communities. The hybrid approach of Surface Water Management (a combination of catchment management, blue/green corridors, SuDS features and new surface water sewers) has been identified as the best value option in eight L4 drainage communities.

Whilst these measures will also address some of the **internal property sewer flood risk** (e.g., 8,084 properties would benefit through these measures within AMP8, 2025-2030), further measures are required to achieve NWG's ambitious flood goals. This is due to below-ground storage typically being located at the SO asset as an 'end-of-pipe' type option, thus it does not provide flood risk reduction in the catchment. Where further measures are required, where feasible, the hybrid approach of Surface Water Management is also adopted, which reduces the volume of flood storage required, as well as providing wider environmental and social benefits. Some further below-ground storage in catchments is also promoted to address the internal property flood risk. With these additional measures a total of 11,527 properties are expected to benefit from reduced risk of internal sewer flooding within AMP8.

To accommodate population growth and development whilst managing changes in **Dry Weather Flow compliance**, measures are included in the plan to upgrade 26 WwTWs within AMP8, typically this will be through WwTW extensions.

The timeline for delivery of measures has been established based on the sensitivity of the catchment (in relation to SOs), the anticipated targets emerging from Defra's consultation on the SODRP (which itself is informed by the sensitivity of catchments), and NWG's Ambitious Goals for flood risk reduction.

In addition to the selected options for each drainage community, the DWMP includes overarching commitment to partnership working, such as with other flood risk authorities like the Environment Agency or local authorities. Further, NWG operate a number of 'business as usual' activities, tools, and procedures to help manage and optimise wastewater systems.

Options within the DWMP have been selected to achieve:

Storm overflows

- All SO occurrences where discharges are to a WFD watercourse with 'Water Industry – Intermittent Discharges' as a reason for the Not Achieving Good Status (RNAGS) eliminated by 2045.
- All other inland SOs, including those that are located within the vicinity of a High Priority area, Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC) and eutrophic sensitive areas reduced to an average of ten annual spills by 2045.
- All SOs linked to the ecological standards of designated bathing waters to be reduced to an average of no more than one annual spill by 2045
- These measures see 101 high priority SOs improved by 2030; with all 265 high priority SOs improved by 2045; and all 1,567 SOs improved by 2050.

Flood risk

- 11,527 properties benefit from reduction of internal property sewer flood risk within AMP8 (2025-2030), increasing to a total of 33,598 properties by the end of AMP10 (2040).

WwTW DWF compliance

- Maintenance of performance of WwTW DWF compliance through investment at 26 WwTWs.

NTS 1.7 Assessment of the Preferred Approach in the Draft DWMP

The reasons the preferred approach was selected, and other options rejected is set out in **Table 6.2.1**. Key reasons for the large-scale uptake of below-ground storage within the plan are:

- it provides reliable flow reduction to meet the key performance targets of the plan;
- it can be delivered by NWG at individual locations within a drainage community, enabling faster delivery to meet the emerging SO targets;
- it allows SO at RNAGS sites to be abandoned to meet the emerging SO targets; and
- it is the most cost-beneficial option.

Key reasons for the limited uptake of Surface Water Management within the plan are:

- alone it often does not provide the level of benefit required to achieve spill frequency reductions at SOs, which is one of the key performance targets of the plan;
- it can be far more expensive than below ground storage. On average, it has been found that this type of option can be in the region of 10 – 15 times more expensive. For example, in Alnwick Drainage Community 06, this hybrid approach is estimated to cost £19 million compared to £2 million for below ground storage;
- includes a less mature, more uncertain suite of options, providing less surety in the ability to meet the emerging SO targets;
- typically needs to be applied across large areas of a catchment (e.g., 5 hectare) to achieve the relevant SO and flooding requirements;
- it is required across large areas, making it harder to implement particularly within urban areas where it needs to be integrated within the wider land uses;
- typically it can only be achieved through partnership working and a longer-term planning approach; and
- partnership working takes several years longer to deliver than traditional grey solutions and thus results are unlikely to be able to be achieved at the scale necessary to meet the shorter-term SO targets.

Table NTS 2 and **Table NTS 3** draw together the total effects of the Draft DWMP in combination with the underlying trend, to establish the cumulative effect. The key for **Table NTS 2**:

Assessment key:

Major positive	+ + +	Moderate positive	+ +	Minor positive	+	Neutral	0
Major negative	- - -	Moderate negative	- -	Minor negative	-	No relationship	

Table NTS 2 – Overall Plan Score

Level 1 Study Area

	Protect, conserve, and enhance biodiversity & geodiversity, including soils	*Protect, conserve, and enhance Human Health and well-being, including resilient communities*	*Protect, conserve, and enhance social and economic prosperity*	*Address causes of climate change, manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation*	*Protect, conserve, and enhance water resources*	*Reduce and manage flood risk, increasing flood resilience*	*Protect, conserve, and enhance the historic environment, including archaeology*	*Conserve, protect and enhance the landscape, townscape, and visual amenity*	*Adapt, and improve resilience to climate change*
	Biodiversity and Geodiversity	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
Overall DWMP: during construction	-	0	+	- -	-		-	0	
Overall DWMP: during operation	++	+	+	- -	+++	+++	+	+	+

Table NTS 3 – Summary of total plan effects and cumulative effects

SEA Objective	Total plan effects	Cumulative effects
Biodiversity & Geodiversity	The plan prioritises measures where SOs are impacting the identified RNAGS (in relation to ecological status) within watercourses, and other high priority inland SOs (such as SSSIs). This will provide a significant positive permanent benefit for aquatic biodiversity. As the implementation of the plan progresses, the benefits of the plan will extend across the plan area. WwTW upgrades to cope with additional demand from population growth will prevent damage to aquatic biodiversity from that population increase. The construction of below ground storage, sections of new surface water sewers and WwTW upgrades will result in localised temporary loss of	Climate change will impact wildlife in the future by various means including, but not limited to, drought, timing of seasonal activities, higher frequency of storms, native species redistribution, invasive non-native species, and increased potential for wildfire. Changing climate could impact on the quality of soils across the region through temperature extremes and changing rainfall patterns.

SEA Objective	Total plan effects	Cumulative effects
	biodiversity during construction. The significance of the effect will depend on the current land use and ecological value (e.g., ranging from no value within a highway, to high value within a designated site). Careful siting, planning and construction will be required to avoid and minimise impacts. Potential exists for biodiversity net gain within reinstatement (again, this will be location specific). The Surface Water Management approach offers the potential for long term positive effects on terrestrial biodiversity and geodiversity. Within rural areas, catchment management provides an opportunity to slow the rate of drainage, including of important habitats, contributing to rewilding and supporting natural hydrogeological processes. Within more urban areas, blue/green corridors and SuDS provide opportunities to provide/enhance biodiversity. The level of benefit achieved will depend on the extent of implementation of these green options, and their design.	Development pressure is likely to increase the risk of habitat loss and fragmentation, particularly outside of the extensive designated areas. Through partnership working, measures such as blue/green infrastructure offer the potential to increase resilience to climate change by allowing the movement of species through the environment and supporting natural soil processes. Reduced spills from SOs and WwTW upgrades will support biodiversity, reducing susceptibility to the above threats.
Human Health	Human health is particularly important in this region where the health of residents is lower than the average for England, life expectancy ranges from 6.6 to 15.26 years lower than the average for England and childhood obesity rates are up to 26.9%. The plan will eliminate internal property flood risk to over 11,000 properties by 2030 and to all 27,788 properties by 2040, providing immediate permanent human health benefits in relation to health (exposure to sewage) and well-being (stress, anxiety). SOs discharging to designated bathing waters will be reduced by 2035, providing a permanent positive effect on human health. These measures may increase the uptake of open water swimming, providing further health and well-being benefits. Surface Water Management measures provide an opportunity to provide access to green spaces with improved connectivity through them, providing a permanent positive effect on human health. The level of	The population of the UK is ageing, putting additional pressures on public finances and services. Policy is placing increasing emphasis on access to green space, green infrastructure, and improved accessibility to sustainable modes of transport. Surface Water Management measures provide an opportunity to support these measures, improving health and well-being.

SEA Objective	Total plan effects	Cumulative effects
	benefit achieved will depend on the extent of implementation of these green options, and their design. Potential exists to provide public access above below-ground storage assets, such as play areas, gyms, etc (this will be location specific).	
Socio-economic	The plan area experiences higher than average levels of unemployment, with a large number of neighbourhoods being the most deprived nationally. This can result in communities being more susceptible to the effects of flooding (e.g., residents are less likely to have home insurance or available funds for clean-up and replacement of goods). As such reduced flood risk provides a positive, permanent, long-term effect to a more sensitive population. Given the scale of work that will need to be implemented through the plan, there is likely to be a socio-economic boost such as employment opportunities through the construction phase. Whilst this will be temporary, it is expected to continue in the long-term until 2045. The multi-functional nature of blue/green corridors can provide active travel routes (such as footpaths and cycle paths), increasing low-cost transport options on a permanent basis.	In both the short and longer term, there is uncertainty in relation to socio-economics across the country. Whilst the plan is unlikely to substantially affect this, the flood risk reduction and water quality improvement measures will reduce risks and support a good economic and social environment.
Carbon & Material Assets	Given the scale of below ground storage to be implemented through the plan, there is expected to be a moderate adverse effect on carbon and material assets through the construction of below ground concrete storage, and the subsequent on-going increased wastewater treatment requirements. Following feedback as part of the SEA process, the volume of storage has been reduced through increased use of Surface Water Management in certain drainage communities where it has been shown to be able to provide the appropriate level of surety of achieving the outcomes required.	The future trend is towards reducing carbon emissions and increased resource efficiency. The below ground storage approach does not necessarily support. However, the majority of the negative impact is likely to be during the construction phase rather than operation (depending on the amount of pumping and additional treatment that may be required.

SEA Objective	Total plan effects	Cumulative effects
	Surface Water Management measures are typically not resource intensive to construct, operate, or maintain, providing nature-based solutions. There may be opportunities for increasing the uptake of this hybrid approach through the implementation of the plan, thus reducing the significance of the impact. The use of both selected options is likely to increase pressure on land use. Below ground storage and WwTW upgrades require relatively small areas of land on a permanent basis. Surface Water Management must be applied over much larger areas, however, it can be integrated with other land uses.	
Water Resources	The DWMP will result in major positive permanent effects on water quality through reduction in spills from SOs and WwTW improvements to accommodate population growth and the changing climate. This will have secondary benefits for biodiversity, human health and socio-economics. There is potential for short-term, localised, temporary pollution of watercourses through construction works in close proximity to watercourses. However, in line with legal requirements and best practice, these are anticipated to be prevented through good construction practices.	Climate change and growth are anticipated to increase stress on the water environment, such as through changing rainfall patterns, extreme weather events and increased demand for water and associated wastewater treatment requirements. The DWMP has accounted for these pressures and is designed to address them to help address this issue.
Flood Risk	The DWMP will result in major positive permanent effects by reducing internal sewer flood risk. Further positive permanent effects may also be achieved in terms of reduced surface water flood risk where surface water management is improved to reduce the risk of sewer flooding.	Flood risk is anticipated to increase as climate change progresses as a result of changing rainfall volumes and intensity. The DWMP has accounted for the anticipated changes whilst reducing the risk of sewer flooding to help address this issue.
Heritage	At the plan level, there are no anticipated significant effects on heritage assets, although sewer flood risk reduction measures are likely to reduce the sewer flood risk to some heritage assets, such as Listed Buildings, providing a minor positive permanent effect.	Historic assets may be at greater risk from the direct impacts of future climate change, through flooding, sea level change, storms, and other factors; the DWMP will help to address those risks associated with sewer flooding.

SEA Objective	Total plan effects	Cumulative effects
	Construction works, particularly those that involve ground works are likely to have a minor negative effect on heritage assets, particularly archaeology. However, this will be location specific, with potential for significant adverse effects at the project level which will require further controls (see **Table 7.1.1** below).	
Landscape	Below ground storage, once restored post construction, is not anticipated to have a landscape impact. Where Surface Water Management measures are planned within urban areas, there is potential for a positive benefit in terms of townscape (design dependant); where planned within rural areas there is potential for positive landscape impact (dependant on design reflecting the local landscape charter). Given the proposed scale of implementation of this option, it is noted as a minor positive permanent impact.	Climate change has the potential to impact high value landscapes through changing patterns of rainfall or sea level rise; population growth also has the potential to erode landscape quality. Surface Water Management measures may help address these issues where it is implemented.
Climate Change Resilience	Overall, the DWMP will have a minor positive permanent effect in supporting resilience to climate change. Below ground storage will provide wastewater storage for later treatment and release. Surface Water Management will increase climate change resilience by slowing the flow of water, promoting natural flood risk reduction, supporting biodiversity in terms of habitats and their connectivity and in urban areas helping to counter the urban heat island effect. The magnitude of the positive effect of the plan could be increased by increased adoption of this option.	The plan will support the wider move to increase resilience to climate change.

NTS 1.8 Measures to Prevent, Reduce & Mitigate Adverse Effects and Enhance Beneficial Effects

Measures have been suggested throughout the SEA process and plan development. Changes made as a result include reduced reliance on the below ground storage option, in favour of an increased uptake of the hybrid Surface Water Management approach. This has increased cost by £273m (before accounting for additional wastewater treatment costs).

As the plan is taken forward, further measures will be required to prevent, reduce, mitigate, and compensate adverse effects and maximise the beneficial effects of the plan. These are set out in **Table 7.1.1** of the report.

NTS 1.9 Recommended Further Work to Enhance the Plan

It is recommended that consideration is given to the following further work to enhance the plan as it develops and is implemented:

- Consideration should be given to including within the cost benefit analysis the carbon 'costs' (embodied and operational) of the plan, and the CAPEX costs associated with the additional wastewater treatment requirements from use of the storage option.
- The modelled costs, benefits and hydraulic performance of the Surface Water Management approach should be kept under review and refined as appropriate as experience of such measures grows. It may be appropriate to undertake pilot schemes in partnership with others (including universities/researchers) to inform the development and implementation of this approach within AMP8; and its assessment within subsequent DWMPs.
- As experience and knowledge of the performance of the Surface Water Management approach grows, its adoption within AMP8 should be increased where feasible within drainage communities as part of the solution (thus reducing the storage volume and subsequent water treatment as well as providing wider benefits).
- NWG and wider partners should continue joint working with momentum, which is essential to implement the Surface Water Management approach which can achieve wider social and environmental benefits beyond those directly associated with overflows, flood risk and WwTW compliance.
- Information developed through the plan making stage should be shared where this may assist and influence other stakeholders (e.g., planning authorities, developers, LLFA). For example, the plan has developed new data to identify the area of impermeable runoff that would need to be removed from the combined sewer network to achieve the ambitious target of zero internal flooding. This could influence wider stakeholders who could work to help achieve this.
- Within subsequent DWMP cycles, consideration should be given to the potential to include consideration of catchment level nutrient management.

1 INTRODUCTION

1.1 Introduction and Background

This draft Environmental Report sets out the findings of Stages B and C of the Strategic Environmental Assessment (SEA) process, for Northumbrian Water Group's (NWG) new draft Drainage and Wastewater Management Plan (DWMP). DWMPs are guided by Water UK's: 'A framework for the production of Drainage and Wastewater Management Plans'[3] (subsequently referred to as the 'Water UK framework'). The content within this report allows stakeholders to understand the likely environmental and social impacts of the DWMP.

DWMPs set out the long-term investment plan for drainage and wastewater, defining priorities for investment. The Water UK framework advises that as DWMPs are not currently a statutory requirement, they do not fall within the remit of the SEA Regulations; however, it is best practice to undertake SEA on the final optimised plan. DWMPs will become a statutory requirement under the Environment Act 2021 which introduces Drainage and Sewerage Management Plans (DSMPs) (otherwise known as a DWMP) however this section is not enacted until April 2023, after the DWMP is published. None the less, NWG plan to fulfil the requirements of the SEA Regulations. In order that the SEA process is effective in influencing the plan, NWG has chosen to integrate SEA into the earlier option definition and appraisal stages in addition to the final optimised plan.

SEA provides an opportunity to consider ways by which the plan can contribute to improvements in environmental conditions; as well as a means of identifying and mitigating any potential adverse environmental effects that the plan might otherwise have. It informs the decision-making process through the identification and assessment of significant and cumulative effects a plan or programme may have on the environment. By doing so, it helps make sure that the proposals in the plan are the most appropriate given the reasonable alternatives. The SEA process is conducted at a strategic level and enables consultation on the potential effects of a plan with a wide range of stakeholders.

1.2 Overview of Northumbrian Water's DWMP

The DWMP takes a long-term view to set out how NWG intend to extend, improve, and maintain a robust and resilient drainage and wastewater system over a planning period of 40 years. It will inform the company business plan submission for PR24 (Price Review 2024) ahead of Asset Management Plan (AMP) 8 for the period 2025 – 2030. Key performance targets for the plan are to:

- achieve the expected Storm Overflow (SO) targets (see **Section 2.1** for further details);
- achieve NWG's Ambitious Goal of zero internal property sewer flooding by 2040; and
- ensure that all wastewater treatment works (WwTWs) are complaint with their Dry Weather Flow (DWF) treated effluent consent values.

The scope of the DWMP includes wastewater and drainage networks (foul, combined and surface water sewers), interconnecting drainage systems (such as highway drains and

[3] Water UK (2021) DWMP Framework Guidance, available from: https://www.water.org.uk/wp-content/uploads/2021/10/DWMP_Framework_Report_Main_Report_September_2021.pdf, accessed March 2022.

culverted watercourses), wastewater pumping stations, and wastewater treatment works systems looking at a combination of flooding and environmental impact.

NWG recognise that to get the best outcomes for all in the region, it needs to work collaboratively with customers and all organisations who have an interest in the issues – including stakeholders with an interest in planning, development, risk management and the environment.

The DWMP Study Area aligns with the operational boundary for NWG's provision of wastewater services[4], as shown in **Figure 1.2.1**. The overall Study Area (as shown by the red boundary) (Level 1) is split into seven Strategic Planning Areas (SPA) (Level 2); and subsequently into Tactical Planning Units (TPU) (Level 3) (depicted by green shading). The TPUs are further split into Drainage Communities (Level 4). The latter are at a local catchment scale predominantly for WwTWs. Whilst not all catchments are covered by the DWMP, it does cover 99% of the population.

The DWMP provides two main outputs:

1) A strategic plan to drive investment where it is needed in the short- and long-term planning horizons to ensure robust and resilient drainage and wastewater services are provided.

2) Options for both the short- and long-term planning horizons and at varying scales ranging from the smaller drainage community interventions to large inter-catchment solutions.

[4] Note the area of water supply by NWG is slightly different from the area of wastewater services. In part of the study area, Hartlepool Water is responsible for the water supply.

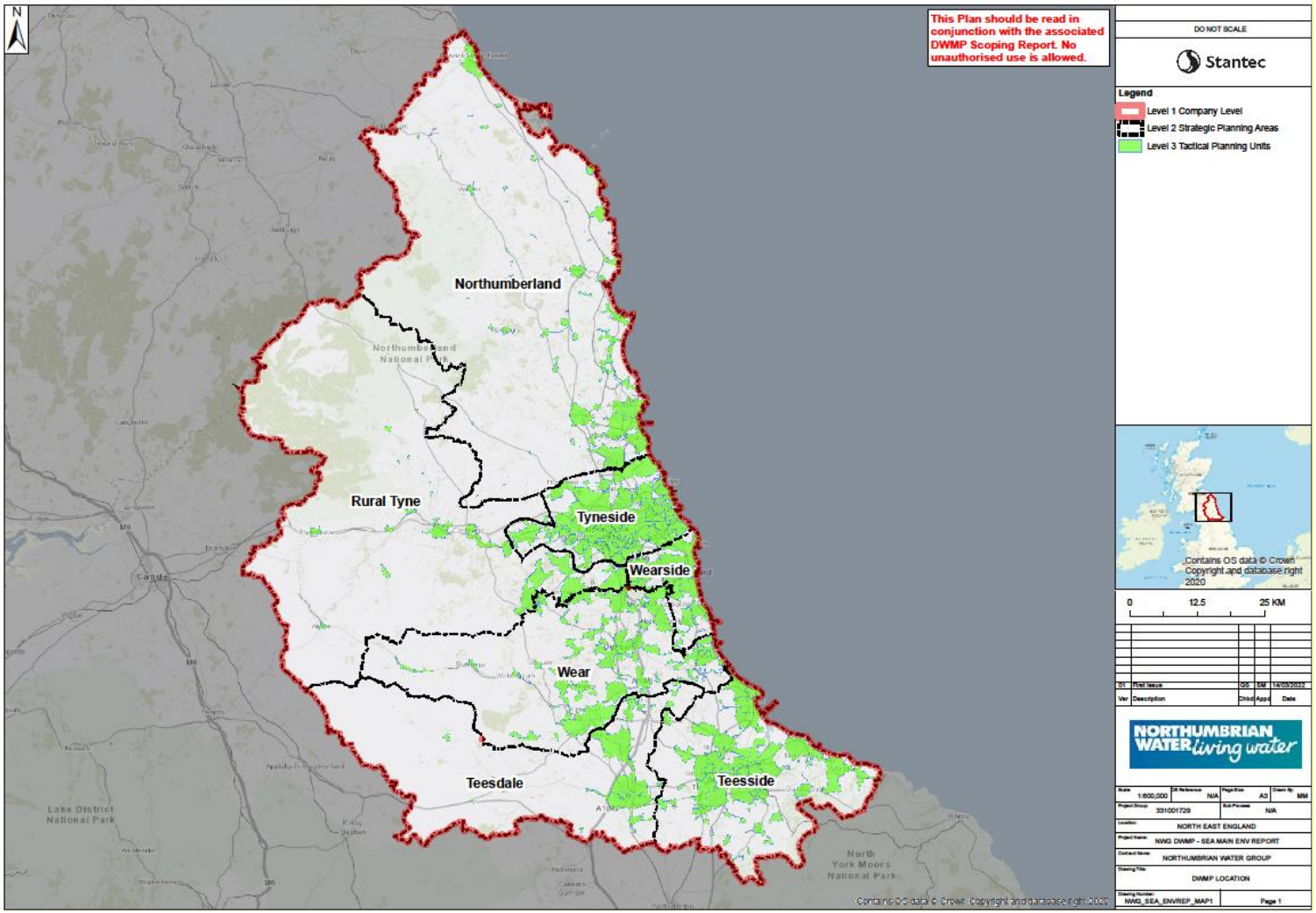

Figure 1.2.1 – Study Area

1.3 Relevant DWMP Guidance

The eleven English and Welsh water and wastewater companies that are subject to regulatory price controls have committed to produce DWMPs in accordance with the Water UK framework. The framework results from collaboration between Defra; the Welsh Government; Ofwat; the Environment Agency; Natural Resources Wales; Consumer Council for Water; the Association of Directors of Environment, Economy, Planning and Transport; Blueprint for Water; and water companies.

The Water UK framework establishes the steps for developing a DWMP, as shown in **Figure 1.3.1**Error! Bookmark not defined.. The SEA Process has been completed on the overall plan and has also fed into its creation as is good industry practice. That means that SEA is not a standalone activity within a stage of the DWMP process and aligns to many of the stages shown in dark blue within **Figure 1.3.1.** Further details on the alignment of the SEA to the DWMP process are set out in **Table 1.4.2** in the section below.

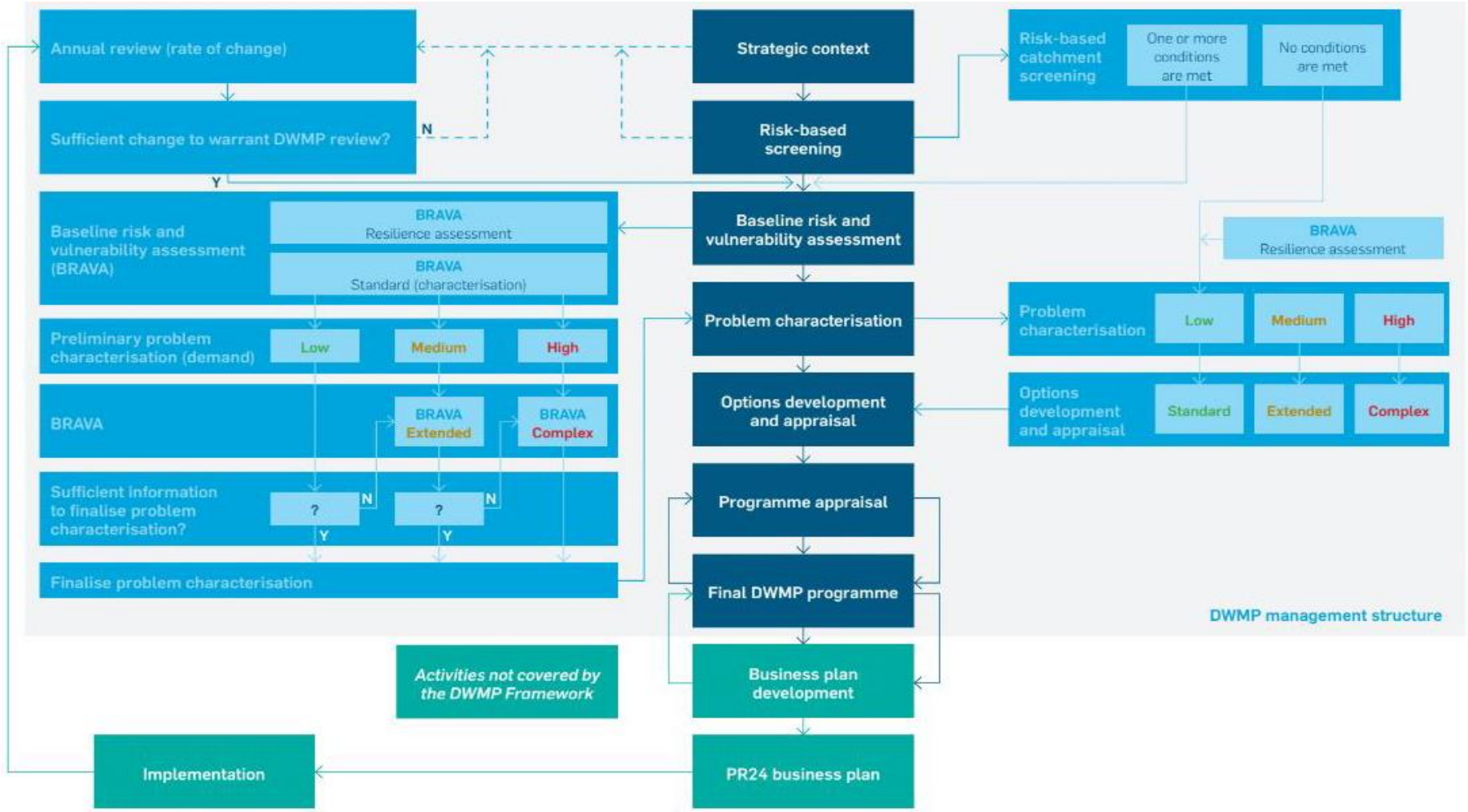

Figure 1.3.1 – DWMP Framework

1.4 Strategic Environmental Assessment Process

Article 2(b) of the SEA Directive (Directive 2001/42/EC) defines 'environmental assessment' as a procedure including:

- Preparation of an Environmental Report (including documenting the likely significant environmental effects of the plan, including reasonable alternatives).
- Undertaking consultation on the plan.
- Taking the Environmental Report and consultation results into account in decision-making.
- Providing information when the plan is adopted and showing how the results of the environmental assessment have been considered.

The SEA Directive was transposed into UK law via the Environmental Assessment of Plans and Programmes Regulations 2004 (as amended) ('SEA Regulations'). The SEA Regulations require an assessment of the effects on the environment of "plans and programmes which are prepared for water management and sets the framework for development consents".

Schedule 2 of the SEA Regulations sets out what information environmental reports should contain. This is replicated in **Table 1.4.1**, which also identifies where the information is provided in this report.

Table 1.4.1 – Environmental report information requirements where this is provided in the report

SEA Regulations, Schedule 2 Information for Environmental Reports	Where the information is provided in this SEA Environmental Report
1. An outline of the contents and main objectives of the plan or programme, and of its relationship with other relevant plans and programmes.	Chapter 1.
2. The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.	Chapter 3 and Appendix C.
3. The environmental characteristics of areas likely to be significantly affected.	Chapter 3 and Appendix C.
4. Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and the Habitats Directive.	Chapters 2, 3 and Appendices B and C.
5. The environmental protection objectives, established at international, (European) Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.	Chapter 2 and Appendix B.
6. The likely significant effects on the environment, including short, medium and long-term effects, permanent and temporary effects, positive and negative effects, and secondary, cumulative and synergistic effects, on issues such as— (a) biodiversity; (b)	Chapter 5 and Chapter 6

population; (c) human health; (d) fauna; (e) flora; (f) soil; (g) water; (h) air; (i) climatic factors; (j) material assets; (k) cultural heritage, including architectural and archaeological heritage; (l) landscape; and (m) the inter-relationship between the issues referred to in sub-paragraphs (a) to (l).	
7. The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment of implementing the plan or programme.	Chapter 7
8. An outline of the reasons for selecting the alternatives dealt with, and a description of how the assessment was undertaken including any difficulties (such as technical deficiencies or lack of know-how) encountered in compiling the required information.	Chapter 6
9. A description of the measures envisaged concerning monitoring in accordance with regulation 17.	Chapter 8
10. A non-technical summary of the information provided under paragraphs 1 to 9.	Non-Technical Summary

The UK Government Practical Guide to SEA, the 'Practical Guide'[5], establishes the following stages of the SEA process:

- Stage A of the SEA process sets the context, identifies objectives, problems, and opportunities, and establishes an environmental baseline through a scoping stage.
- Stage B is the impact assessment phase when options are developed and refined through assessment.
- Stage C is the recording stage which cumulates in the preparation of this Environmental Report.
- Stage D is a consultation phase on the draft Plan and Environmental Report.
- Stage E is the subsequent monitoring of the significant effects of the implementation of the DWMP on the environment.

A key aim of the SEA process is to ensure the appraisal is proportionate, relevant and informative to the Plan being assessed.

Stage A was completed through preparation and consultation on an SEA Scoping Report in January 2022. The Scoping Report 'scoped in' all the 'SEA topics' identified in item 6 in the table above. The relevant sections of this report are structured around these topics.

This Environmental Report represents the output at Stage C1 of the process; the consultation represents Stage D1 of the process. **Figure 1.4.1** is taken from the 'Practical Guide' and illustrates the stages in the SEA process and their iterative nature.

[5] Office of the Deputy PM (2005) A Practical Guide to the Strategic Environmental Assessment Directive, available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf, accessed May 2022.

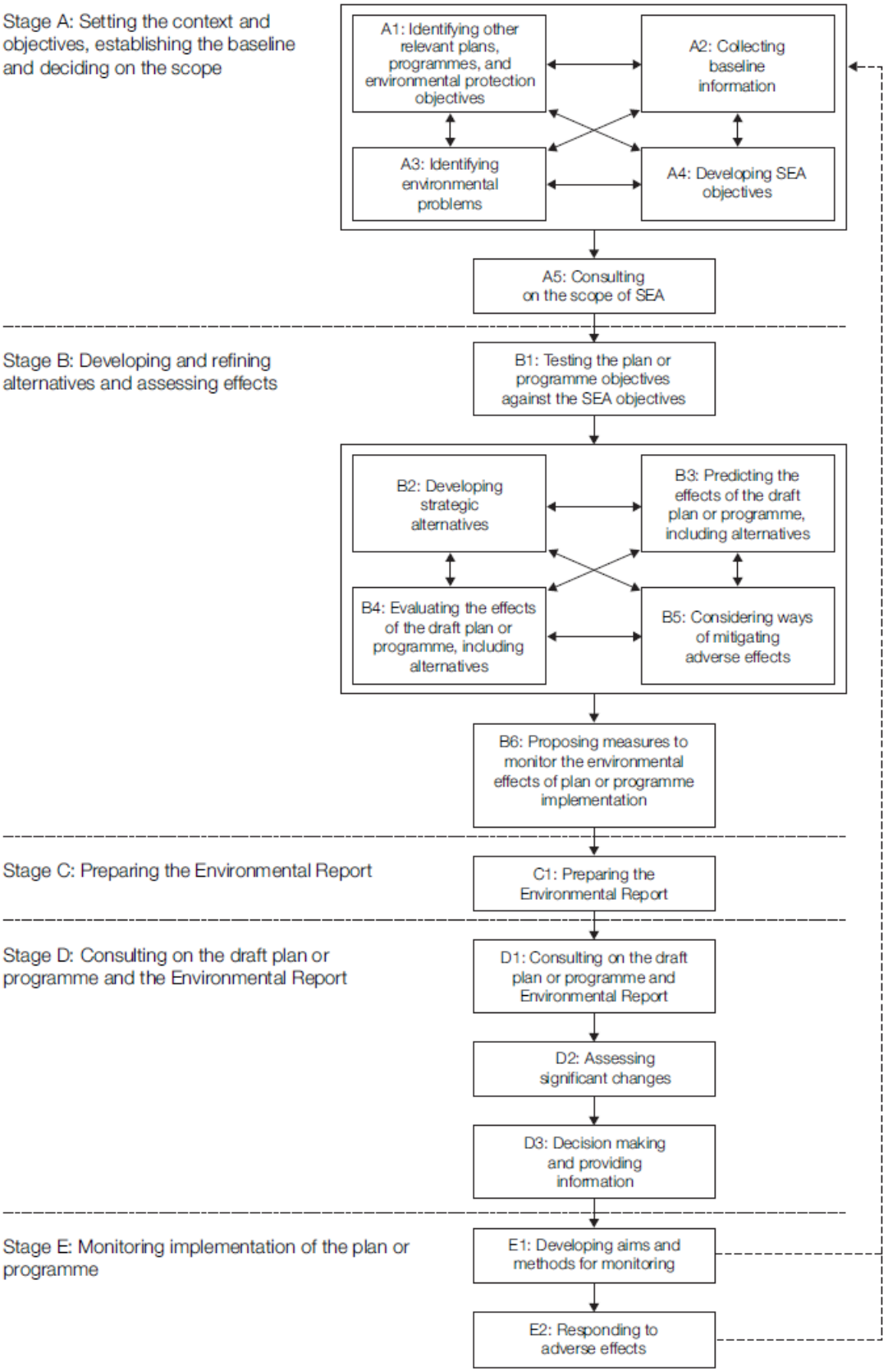

Figure 1.4.1 – SEA Process (Source: ODPM, 2005)

The relationship between the DWMP process and SEA process is set out in **Table 1.4.2**:

Table 1.4.2. – Relationship between DWMP Process and SEA

DWMP Stage	Overview	SEA Stage
Strategic Context	The strategic context document outlines NWG's intended approach to producing the DWMP.	SEA scoping phase, documented in Scoping Report.
Risk Based Catchment Screening (RBCS)	Prioritise catchments for further investigation.	
Baseline Risk and Vulnerability Assessment (BRAVA)	Hydraulic modelling to determine the existing performance of catchments and analysis of the potential impacts of future pressures. Results are assessed against the DWMP's Planning Objectives.	
Problem Characterisation	Identify the level of risk and potential benefits within a catchment to inform option development. Consideration is given to flooding, Storm Overflows (SOs), pollution, Wastewater Treatment Works (WwTW) dry weather flow (DWF) compliance.	
Option Development and Appraisal (ODA)	Identify the generic options available to address the issues identified in the Problem Characterisation stage; appraise and shortlist options to determine the most feasible options.	Assessed in Chapter 5 of this report.
Programme Appraisal	Select options for delivery and their timelines, considering regulatory and ambitious targets.	Assessed in Chapter 6 of this report.
Draft DWMP	The draft DWMP will be issued at the end of June 2022 and will then undergo a period of consultation and customer research.	Draft SEA Environmental Report will be issued in parallel for consultation.
Final DWMP	The final DWMP will be produced in Q1 2023 following the consultation period. The final plan will be used to inform Business Plan development as part of PR24.	Final SEA Environmental Report will be issued in parallel.

1.5 Consultation and Partnership Working

1.5.1 Consultation on Stage A of the SEA Process (the Scoping Report)

The consultation bodies (Natural England, the Environment Agency, and English Heritage), along with wider consultees, were consulted on the Scoping Report for a period of five weeks from 17th January 2022 to 21st February 2022.

Feedback received during the consultation has informed the appraisal process and hence the development of the plan. A summary of the feedback received, and how comments have been addressed, is included in **Appendix A - Consultation responses**.

1.5.2 Consultation on Stage D of the SEA Process (the Environmental Report)

This SEA Environmental Report is issued for consultation along with the draft DWMP, for **12 weeks** until **23rd September**, including to the SEA consultation bodies.

The draft DWMP and associated documents including the SEA, are available to view and download free of charge from www.nwl.co.uk/dwmp. Responses should be provided via this weblink by **23rd September 2022**.

1.5.3 Partnership Working and Wider DWMP Consultation

It is widely recognised and acknowledged that drainage systems are complex and have a number of interactions, both known and unknown. It is therefore important that the DWMP is not created solely by NWG. Whilst NWG has been tasked with the delivery of the DWMP, it is critical that relevant stakeholders actively participate and provide support in its creation.

NWG has worked with various relevant stakeholders in the production of the DWMP, including the Environment Agency, Lead Local Flood Authorities, Local Planning Authorities, Developers and Environmental Partners.

Through different partnerships and strategies, NWG plays an active role within the region to work collaboratively with stakeholders on a number of projects. The DWMP builds on the strong foundation of the Northumbria Integrated Drainage Partnership (NIDP), which consists of fourteen Lead Local Flood Authorities, the Environment Agency and NWG. The award-winning partnership approach, which is formulated on a collaborative approach of identifying priority investment areas with multi-stakeholder benefits, provides an excellent platform for the DWMP.

NWG created a single stakeholder Strategic Planning Group (SPG) covering all of the seven SPAs. The decision was taken, in line with the DWMP Framework recommendation, to create a single SPG to drive consistency and to optimise the engagement process. The DWMP report will set out the representatives and the terms of reference.

In Autumn 2020, NWG engaged with customers through a series of interactive tasks and activities regarding the DWMP. The results from this research have helped shape the plan. The four broad goals that NWG wanted to achieve through this research were to:

- Understand what customers want the plan to aim for, and which aims are most important to them.
- Understand how customers prefer NWG to improve wastewater services.
- Understand how customers would like NWG to go about prioritising the DWMP.
- Understand how customers think they should be involved in developing the DWMP.

By the end of this customer investigation, it was possible to arrive at an understanding of what the wider NWG customer base would think about the DWMP under informed

conditions. Overall, the research findings have been used to shape the nature and priority of the options for the areas of the highest risk.

1.6 Difficulties Faced and Limitations

Chapter 3 (Baseline Environment) has used professional judgement to review published datasets. The baseline information is provided at the strategic level, thus it does not identify some local issues, as these may not represent wider trends across the region. Post SEA, optioneering and project development will identify specific locations and schemes where additional local datasets and baseline information are likely to be required to assess and manage environmental and social impacts.

Whilst the most up to date information has been considered, datasets are regularly reviewed and therefore could change during the SEA process. The baseline environment appendix includes an assessment of a future environmental baseline. The very nature of this predictive assessment means that there is uncertainty in the reporting; for some topics predictions are available (albeit with variability in the spatial and temporal projections (e.g., predictions over 20 years or 25 years); others are reliant on professional judgement and observed trends.

Within **Chapter 5**, options are assessed as stand-alone measures; **Chapter 6** assesses the overall approach taken in the plan based on the combination of options and wider measures within the plan. The plan includes the use of hybrid options (e.g., combining a green/ blue corridor with grey piped infrastructure). There will naturally be some fluidity within the implementation of measures that arise from the plan, such as the proportion of green and grey options within a catchment based on subsequent more detailed work.

The DWMP prioritises investment over a five year horizon from 2025, however it also reaches towards an ambitious long term horizon to align with Water Resources Management Plans (note, these are different from DWMPs with a context on clean water and resource usage). It is recognised that levels of confidence of the impacts and uncertainty increases in the longer-term planning horizon, noting that the plan is to be reviewed every five years.

As the development of DWMPs is a new evolving area, some iteration in the DWMP and SEA process is expected as the DWMP is developed, including in future DWMP reporting cycles. The five year review cycle provides an opportunity to review the current findings based on the experience gained within the implementation of this first DWMP.

The recent Defra consultation on storm overflows (see **Section 2.1** for further details) has changed the requirements for the DWMP at a late stage in its development. The final requirements of the document will not be available until September 2022, as such further amendments to the plan may be required before it is finalised in 2023.

2 POLICY CONTEXT

The SEA Regulations require the Environmental Report to include:

> *An outline of the contents and main objectives of the plan or programme, and of its relationship with other relevant plans and programmes.* (SEA Regulations (2004), Schedule 2, paragraph 1).
>
> *The environmental protection objectives, established at international, Community or Member State level, which are relevant to the plan or programme and the way those objectives and any environmental considerations have been taken into account during its preparation.* (SEA Regulations (2004), Schedule 2, paragraph 5).

2.1 Review of Relevant Plans, Programmes and Objectives

A full review of the plans, programmes, and environmental protection objectives relevant to the DWMP can be found in **Appendix B** in tabular format. These were reviewed within the SEA Scoping Report to establish the requirements applicable to the plan to inform the development of the SEA Framework.

A key change since the Scoping Report is the publication of Defra's Consultation on the Government's Storm Overflow Discharge Reduction Plan[6] (the 'SODRP consultation') on 31 March 2022, aiming to eliminate all harm from SOs in the long-term.

The consultation sets out three target areas for compliance. These are:

Protecting the environment

Headline target: Water Companies shall only be permitted to discharge from a storm overflow where they can demonstrate that there is no local adverse ecological impact. This must be achieved for all storm overflow sites by 2050.

Sub-targets:

- *The headline target must be achieved for most (75%+) storm overflows discharging in or close to high priority sites by 2035.*
- *It must be achieved for all (100%) overflows discharging in or close to high priority sites by 2045.*
- *Water companies must plan to achieve this target for all remaining storm overflow sites by 2050.*

Protecting public health in designated bathing waters

Headline target: For storm overflows discharging into or near designated bathing waters, water companies must significantly reduce harmful pathogens by either applying disinfection, such as ultraviolet radiation, or reduce the frequency of discharges to meet the Environment Agency spill standard by 2035.

[6] Consultation on the government's storm overflows discharge reduction plan (defra.gov.uk)

Ensuring storm overflows operate only in unusually heavy rainfall events

Headline target: Storm overflows must not discharge above an average of 10 rainfall events per year by 2050.

Sub-target: Water companied must also ensure all overflows, regardless of where they discharge to, have screening controls to limit discharge of persistent inorganic material (as well as faecal and organic solids), and they must be well maintained.

NWG's interpretation of these emerging targets results in the following targets as set out in **Table 2.1.1** below. NWG apply the 'protecting the environment target' by using the Environment Agency 'RNAGS' data to identify where 'Water Industry Intermittent Discharges' are identified as the Reason for Not Achieving Good (Ecological) Status (RNAGS) within a watercourse, adopting a zero-spill target by 2045.

Table 2.1.1. – Storm Overflow Categorisation

Storm Overflow Category	Spill Frequency Target Details
Storm Overflows that discharge to a Water Framework Directive (WFD) watercourse with 'Water Industry – Intermittent Discharges' as a Reason for Not Achieving Good (Ecological) Status (RNAGS)	**Zero spills from all relevant assets by 2045.**
All other inland Storm Overflows, including those that are located within the vicinity of a High 'Priority' area (Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC) and eutrophic sensitive areas)	**No more than ten annual spills (on average) from all relevant assets by 2045.**
Storm Overflows linked to the ecological standards of designated bathing waters	**No more than one* annual spill (on average) from all relevant assets by 2035.**

** Spill frequency is lower than the targets outlined in the storm overflow consultation document, which dictates two or three spills per bathing water season, depending on the Bathing Water classification.*

The consultation notes that 'Water companies must clearly set out how they will meet their storm overflow targets in their Drainage and Wastewater Management Plans'.

The SODRP is expected to be finalised in September 2022, as such there is some uncertainty as to the targets that will need to be achieved through the final DWMP.

2.2 Key Themes of Applicable Plans, Programmes and Objectives

The key themes and messages arising from the applicable plans, programmes, and objectives are summarised in **Table 2.2.1**:

Table 2.2.1. – Key themes and messages of applicable Plans, Programmes and Objectives

SEA Topic	Key theme and messages
Biodiversity and Geodiversity	• Conserve and enhance biodiversity, including designated and non-designated sites, priority habitats and species. • Contribute to nature recovery networks to increase habitat connectivity, including through green infrastructure. • Prevent habitat fragmentation. • Increase resilience of biodiversity to climate change. • Support biodiversity net gain (BNG). • Support the UK Government 25 Year Plan to Improve the Environment. • Protect resources such as high-quality soils, good quality agricultural land and mineral resources. • Promote catchment-wide approach to land management by relevant stakeholders. • Reduce risk of contamination and contribute to remediation.
Human Health	• Recognise open spaces, water resources and access to nature are important to support human health, well-being, community cohesion and meet recreation needs. • Ensure communities are safe, prevent flood risks to human health. • Ensure communities have secure water supplies and effective wastewater services. • Foster social inclusion and community stakeholder participation.
Socio-economic	• Promote a sustainable economy for social and economic prosperity, such as through protection of important infrastructure. • Reduce social deprivation and inequality. • Promote a green economy
Carbon & Material Assets	• Contribute to net zero carbon targets. • Utilise resources efficiently throughout the lifecycle of a scheme. • Prevent and reduce waste generation, including hazardous wastes. • Encourage effective use of land, such as previously developed land. • Reduce harmful air pollutants, especially in sensitive areas.
Water Resources	• Eliminate all harm from SOs in the long-term, focus on high priority sites in the short-term. • Improve water quality in all water bodies to meet Water Framework Directive (WFD) targets and designated site targets (for water quality and flow). • Prevent or limit pollutants into water resources (groundwater, surface water, coastal water). • Develop approaches resilient to climate change (extremes of weather, flood, drought, low flow etc). • Promote efficient use of water. • Ensure high quality drinking water resources. • Contribute to healthy watercourses, seas, and oceans. • Support aquatic biodiversity. • Support improvements that will benefit bathing water quality. • Support a catchment wide approach to water quality.
Flood Risk	• Reduce and manage flood risk from all sources. • Increase resilience to flooding from all sources. • Support a catchment wide approach to water management.
Heritage	• Assess, and avoid, minimise and/or mitigate as appropriate, any impacts to heritage assets including archaeology and built heritage and their settings. • Avoid effects resulting from changes to water level (surface or sub-surface) on all historical and cultural assets, including undiscovered resources.

SEA Topic	Key theme and messages
	• Reduce the vulnerability and improve the resilience of heritage assets to flooding where works are proposed. • Promote the conservation and enhancement of the historic environment, including historic landscapes.
Landscape	• Protection of landscape, townscape, and seascape (including designated landscapes, defined landscapes and landscape character). • Changes in water levels in the landscape (such as through low flows in rivers or flooding) could affect landscape and visual amenity.
Climate Change Resilience	• Increase resilience to the impacts of climate change both at present and in the future (such as changes to water availability, extremes of weather and flooding).

3 BASELINE ENVIRONMENT

The SEA Regulations require the Environmental Report to include:

> *The relevant aspects of the current state of the environment and the likely evolution thereof without implementation of the plan or programme.* (SEA Regulations (2004), Schedule 2, paragraph 2).
>
> *The environmental characteristics of areas likely to be significantly affected.* (SEA Regulations (2004), Schedule 2, paragraph 3).
>
> *Any existing environmental problems which are relevant to the plan or programme including, in particular, those relating to any areas of a particular environmental importance, such as areas designated pursuant to Council Directive 79/409/EEC on the conservation of wild birds and the Habitats Directive.* (SEA Regulations (2004), Schedule 2, paragraph 4).

3.1 Baseline Review

An important element of SEA is to identify the current environmental baseline both to identify existing issues and opportunities, and to inform the assessment of potential impacts of the DWMP. Data informing the baseline has been predominantly sourced from publicly available national datasets and much is associated with the plans, policies, and objectives listed within **Appendix B**.

SEA also requires consideration of the likely future baseline in the absence of the DWMP. This has been considered through review of the available information (such as climate change projections) and consideration of the underlying trends and the likely effects of other plans and projects. Often it is based on professional judgement.

The Baseline Environment Review can be found in **Appendix C** and it is organised into SEA topics. The SEA topics have been selected and organised by considering SEA guidance and the context of the region and the plan being assessed. The future baseline is presented at the end of each SEA topic. The baseline review has been updated in light of feedback received through consultation.

The topics have evolved through the process of assessment and consultation, since the Scoping Report, published in Spring 2022 (see **Section 4.1** for the reasons for these changes).

The SEA topics used are:

- Biodiversity and Geodiversity;
- Human Health;
- Socio-economic;
- Carbon & Material Assets;
- Water Resources;
- Flood Risk;
- Heritage;
- Landscape; and
- Climate Change Resilience.

3.2 Key Issues and Opportunities

The key issues and opportunities identified through the baseline environment review and of relevance to the DWMP are identified in **Table 3.2.1**. Crossover is inherent across some SEA topics, for example resilience to flood risk resulting from climate change. These occurrences have been outlined where applicable.

Issues and opportunities are broad and therefore not aligned to a particular option, such as installing SuDS or a flow transfer. Rather the issues and opportunities are aligned to the scope of the SEA within the context of drainage and wastewater, and ultimately the DWMP. This allows us to consider all options, including novel solutions.

Table 3.2.1. – Issues and Opportunities Summary Table

SEA Topic	Issues	Opportunities
Biodiversity and Geo-diversity	• Loss or fragmentation of ecological habitats. • Loss or fragmentation of habitats leads to the loss or reduction in species biodiversity. • Poor drainage services and wastewater pollution could affect aquatic, marine, and terrestrial ecology. This could further impact food chains and natural capital. • Spread of Invasive Non-Native Species (INNS). • Reduced access for people to utilise or visit important habitats with human health, well-being, social education, and recreation consequences. • Loss of soils and/ or increased soil erosion. • Loss or degradation of good quality agricultural land. • Negative impacts on drinking water sources, including groundwater sources. • Poor soil quality can increase surface runoff with flood risk and erosional impacts. • Contamination risks from operation/ construction. • Intrusion into historical or current landfill sites.	• Reduce loss of biodiversity, support recovery, and reduce fragmentation. • Support objectives for biodiversity net gain. • Incorporate a natural capital approach to grow the area's natural capital. • Use soft engineering techniques for solutions where possible that can improve or create new habitats and/ or sequester carbon. • Support the removal of INNS where future planned options interact with them. • Connect people to nature by improving access to green spaces and biodiversity. • Catchment based land use management, including drainage, can improve soil structure and prevent/reduce soil erosion at the landscape scale. • Ensure soils are protected from contamination, such as during construction and flood events. • Reduce soil erosion, particularly from construction as the effects on soil can quickly become permanent. • Protect better quality agricultural land from disturbance.
Human Health	• Increased population and associated development will generate additional demand for wastewater and drainage services. • Construction activity can impact human health and amenity for local communities. • Some specific options may impact amenity in negative ways such as odour. • If Public Rights of Way (PRoW) or other public access routes are impacted, this could reduce access to green spaces or exercise opportunities. • Poor drainage impacts environmental receptors such as water bodies which can impact human health through consumption (e.g. shellfish	• Provide a resilient plan for sustainable drainage and wastewater management for customers, one that can handle current and future demand. • Ensure construction activities mitigate/ reduce disturbance to local communities. • Enhance the natural environment for recreation purposes to improve well-being. • Reduce the quantity and/ or frequency of discharge events during storms with benefits to natural capital.

	consumption), or recreation (e.g. bathing waters).	
Socio-economic	• Uncertainty over inflation and the rising cost of living may impact the region for the considerable future. • Unemployment rates in the North East are higher than the UK average. • Deprivation is high in parts of the region and is often accompanied by a lack of access to green spaces. • Transport and connectivity within, and to other regions, is limited in places.	• Economic prosperity and employment opportunities/ stability are likely to be more secure as a result of improving the scale, quality, and resilience of the drainage and wastewater network. • Poor drainage can impact important infrastructure such as transport, especially through flooding. A more resilient network will assist regional connectivity.
Carbon & Material Assets	• New built infrastructure is highly likely to generate GhG emissions from embodied carbon, usually contribute negatively towards carbon neutrality objectives. • During operation, some built infrastructure may be carbon/material intensive, such as through significant power and/ or transport requirements. • Siting new wastewater infrastructure can be difficult because of perceptions and local objection. • Globally, resource use is more competitive than ever with increasing prices and dwindling resources available. • Some current wastewater assets are carbon intensive in their operation. • Increased demand from growth in population or the economy is likely to increase overall energy use across the network and the overall waste levels. • Landfills are becoming more difficult to source and more expensive, especially in a region which has historically used a lot of previous quarries. • Assets can be vulnerable to extreme weather events and from excessive heat. • Air Quality Management Areas (AQMAs) are present in certain urban areas and local plans aim to reduce air pollution, particularly from industry and transport.	• Opportunity to consider the whole life GhG emissions and aim to achieve carbon neutrality through construction, embodied carbon, and operation. • Building, or rebuilding, assets in a more sustainable way can contribute to sustainable resource use, including supporting reduced carbon, and promoting a circular economy. • Opportunities for increased usage of renewable energy and potential for electricity generation from assets such as utilising heat or water flow. • Opportunity to reduce waste through design and to increase recycling rates and other higher-level options within the waste hierarchy. • Increased resilience to extreme weather and extreme flows can have significant positive effects on human exposure to pollutants and sewer flooding; and environmental pollution/quality. • Redevelopment of assets can reduce emissions to air.
Water Resources	• Population and economic growth will add pressures on the quantity	• Provide a resilient plan for sustainable drainage and wastewater management for

	of drainage and wastewater treatment. • Pollution can affect water quality with subsequent effects to biodiversity, the food chain (such as shellfish) and human health through potable water supplies. • Contamination can occur, or areas previously contaminated can be subject to increased levels. • WFD may fail criteria on achieving Good Ecological Status/ Potential. • Drought conditions can negatively impact surface water flows and quality, as well as the treatment of wastewater.	customers, one that can handle current and future demand. • Promote lower water consumption schemes which will reduce the amount of wastewater needing to be treated. • Ensure the sustainable use of all receiving waterbodies. • Allow more water to remain in the natural environment. • Improve water quality in waterbodies to meet WFD targets. • Early integration of climate change resilience measures provides an opportunity for long term benefits to customers and stakeholders
Flood Risk	• Flood risk, including internal and external sewer flooding. • Existing infrastructure may be towards the end of its lifetime; have been designed to accommodate lower capacity when population levels were lower; when climate change impacts were not considered; or when soft engineering techniques were infrequent, lowering resilience. • Many assets are located close to water bodies, and this ultimately places them at greater flood risk which is anticipated to be increased by climate change.	• Reduce flood risk from all sources. • Increase resilience to flooding including climate change impacts. • Encourage soft engineering techniques both within NWG and wider stakeholders to sustainably manage surface water, thus reducing sewer flood risk (as well as surface water flood risk).
Heritage	• Potential impacts to heritage assets (including built heritage and its setting, archaeology and the historic landscape character), particularly where these are related to the water environment or may be affected by drainage arrangements and flood risk. • There is potential for disturbance of known and unknown heritage assets as well as their setting, especially during construction. • Many wastewater options are intrusive into the ground in a region with strong archaeological heritage. • Hadrian's Wall World Heritage Site (WHS) and close proximity designations, plus buffers, cover a large area in the North East which will constrain some option locations.	• Assess and mitigate appropriately any impacts to heritage assets. • Incorporate improved access to heritage assets where possible, especially for communities where this is previously limited or those who are deprived. • Opportunities exist to discover and preserve archaeological assets which may be previously unknown.
Landscape	• The area enjoys a high proportion of designated (and defined)	• Opportunity to address historic drainage of blanket bog, grassland, and wetlands to slow

	landscapes which could be affected by the plan. • Some option types could affect visual amenity. • Construction can directly impact landscape character and visual amenity. • The region is the most sparsely populated in England and very diverse from a landscape perspective. This means development of any type is likely to be more significant here than in other regions. • Some landowners in the region (predominantly upland areas) control large areas such as whole stream catchments which may present difficulties if they are opposed.	the flow of water and support the natural landscape. • Opportunity to develop sustainable solutions that add to National Parks. • Protect and enhance the diverse landscape character across the region, from uplands to coastal areas. • Opportunity to redevelop assets with current landscape impacts. • Promote sustainable land use. • Opportunities to work with large landowners to implement catchment focussed solutions. • Opportunities to work with others such as the Heritage Coast Partnership.
Climate Change Resilience	• Climate change is anticipated to increase extremes of weather and thus the frequency and severity of flood risk. • Climate change is anticipated to increase extremes of weather with implications for biodiversity, such as through low flows within watercourses and habitat fragmentation. • Those least able to adapt to climate change are likely to be more sensitive to the effects, this could increase socio-economic inequalities.	• Integrate wastewater climate change resilience measures for long term benefits to customers and stakeholders. • Options that are resilient to climate change are likely to have wider ranging benefits across many other SEA topics from biodiversity to flood risk, and human health. • Increased resilience to extreme weather and extreme flows can have significant positive effects on human exposure to pollutants and sewer flooding; and environmental pollution/ quality. • Improve place making and resilience to climate change to reduce socio-economic inequality and level up disadvantaged areas.

3.3 Spatial Baseline Context

The seven Level 2 SPAs were introduced in **Figure 1.2.1**, the Study Area. These areas at Level 2 provide a more formalised way to engage with stakeholders and customers alongside facilitating a more strategic level of planning above the more detailed catchment (Level 3) assessments. The seven SPAs are:

- Northumberland
- Rural Tyne
- Tyneside
- Wearside
- Wear
- Teesside
- Teesdale

Table 3.3.1 provides a brief summary of each SPA.

Table 3.3.1. – Summary of each Level 2 SPA

Level 2 SPA	Key characteristics
Northumberland	• The northernmost Level 2 SPA, it is the largest by area (2,759km^2). It is highly rural, and topography becomes steeper to the west which also includes Northumberland National Park. The Level 2 SPA borders the North Sea.
Rural Tyne	• The westernmost Level 2 SPA, it is the second largest by area (2,575km^2). It is highly rural, and topography becomes steeper to the west which also includes Northumberland National Park. The majority of the Level 2 SPA would be described as either undulating or hilly. The Level 2 SPA does not border the North Sea.
Tyneside	• A central eastern Level 2 SPA, it is the second smallest by area (425km^2). It is highly urban, and topography is largely flat with some small undulating areas that do not intercept any National Park. The Level 2 SPA borders the North Sea.
Wear	• A central Level 2 SPA, it is the median by area (1,172km^2). It is a mixture of urban and rural, and topography is a mixture of flatter areas towards the east with more undulating and hilly areas towards the west. The Level 2 SPA borders the North Sea.
Wearside	• A central eastern Level 2 SPA, it is the smallest by area (172km^2). It is highly urban, and topography is largely flat with some small undulating areas that do not intercept any National Park. The Level 2 SPA borders the North Sea.
Teesdale	• The south-western most Level 2 SPA, it is the third largest by area (1,211km^2). It is highly rural, and topography becomes steeper to the west which also includes the Yorkshire Dales National Park. The majority of the Level 2 SPA would be described as either undulating or hilly. The Level 2 SPA does not border the North Sea.
Teesside	• The south-eastern most Level 2 SPA, it is the third smallest by area (910km^2). It is a mixture of urban and rural, and topography is largely flat with some undulating areas, with steeper hills towards the southern extent where the Level 2 SPA intercepts the North York Moors National Park. The Level 2 SPA borders the North Sea.

3.3.1 Categorisation of Level 3 Catchments

SEA is strategic in nature and so the assessment of options should not assess each Level 3 (L3) Catchment on its own. However, for this DWMP, the number of Level 2 areas (seven as shown in **Table 3.3.1**) is quite low for a meaningful assessment. To resolve this issue Level 3 catchments have been grouped within their Level 2 SPA using the classification set out below.

The following categories have been used to classify L3 catchments:

1. **HU** - prominent **Historic Urban catchment** (e.g., market towns or locations with high heritage value).
2. **IU** - **Industrial/ Economic Urban catchment** (e.g., city centre catchments; areas of significant industry; or urbanised). The category is used in a wide context for activities of an economic/ commercial purpose.

3. **CU** - **Coastal Urban catchment** (e.g., a coastal urban area such as a tourist focussed seaside town).
4. **LR** - **Lowlands Rural catchment** (e.g., a small village or series of villages that are located at lower altitudes within the context of Northumberland, usually associated with higher quality agricultural land/ mix of pastoral and crop farming).
5. **UR** - **Uplands Rural catchment** (e.g., a village located in the upland areas of Northumberland, usually associated with lower quality agricultural land/ predominantly pastoral farming and/ or National Park boundaries).
6. **SU**- **Suburban Fringe** catchment (e.g., a mixed catchment towards the edge of a large settlement which would be difficult to exclusively place into either a rural or urban category).

Given the varying nature of catchments, the criteria for catchment types are based on judgement, rather than strict numerical values. The judgement has been informed by satellite imagery; Google StreetView; catchment location; population numbers; catchment size; GIS datasets including the agricultural land classification, various heritage and landscape information; and textual information sources when available. Numerical values were not strictly applied as they were found to vary based on the catchment characteristics. For example, in terms of population and catchment size, a small catchment could consist of 1,100 people, whereas a catchment five times larger could consist of 2,000 people, therefore a simple threshold number would not provide accurate groupings. Further, there are several industrial dockland catchments that have very small populations but are almost completely urbanised.

The assessment used catchments provided by NWG, which are usually named in relation to local villages or towns. This means that reviewing just the context of the name could lead to confusion where a catchment named after a small town could be rural when another named after a small village could be urban. This is because the catchment may spread over a large area encompassing many towns and villages/ or be a small town surrounded by a large expanse of rural land. Readers should therefore be aware of this.

Consideration was given to including a coastal rural category; however, this was not taken forward as most of the SEA assessment results were found to be comparable to the lowland rural catchments category. In contrast, there is a category for coastal urban areas as access to open space, air quality benefits, and additional flood risk from coastal waters were found to vary between coastal urban areas and non-coastal areas. These environmental impacts were less likely to be different for rural catchments by their rural nature. This fits the strategic nature of SEA.

3.4 How are Options to be Assessed?

The Water UK framework recommends undertaking SEA on the final Plan, which is for L1, the highest and most strategic level of the DWMP. However, a requirement of the Water UK framework is also to undertake the development of options with an understanding of the environmental and social impacts, supported by SEA requirements.

Undertaking SEA of the final plan was deemed unlikely to be effective in influencing the plan, development of options, and its environmental effects, as such the SEA was carried out during the development of the plan.

To keep the assessment manageable and informative, the assessment of options has been kept relatively strategic within the SEA, for example through the application of the identified options to different types of catchments (upland rural, lowland rural, economic

urban areas, coastal urban, suburban fringe, and historic urban areas). The alternative would be to apply these options to each of the seven SPAs (Level 2) or the 257 TPUs that passed through risk analysis (Level 3). However, the former would be too broad, and the latter would be likely to result in an overly detailed assessment (so not appropriately 'strategic') and would probably be unmanageable given the very large number of options to be assessed.

The resulting number of catchment types was a maximum of 42, with 35 taken forward for assessment as seven were not applicable. This number was deemed to be an appropriate number for meaningful assessment. Seven of the potential catchment types were not applicable because the Level 2 SPA did not include the particular catchment category. For example, there are no coastal urban catchments in the Rural Tyne L2.

4 SEA ASSESSMENT METHODOLOGY

4.1 SEA Framework, including SEA Objectives

This SEA adopts an objective-led approach, in line with the ODPM Practical Guide.

The scope of the objectives has been carefully considered to reflect the SEA Regulations, Water UK framework on undertaking a DWMP, regional information and the nature of the DWMP. Following the review described in the earlier chapters of this report, the SEA framework has been developed based on:

- the key policy messages and environmental protection objectives identified in the review of policies, other plans, and programmes; and
- the environmental baseline conditions and their likely evolution.

The SEA framework includes nine SEA objectives (**Table 4.1.1**), supported by guiding questions (**Table 4.1.2**); which form the basis for the assessment of the DWMP. The purpose of the SEA objectives is to:

- State the direction and priorities of the SEA
- Give a structure to ensure a comprehensive and robust appraisal
- Provide the basis for the identification of relevant indicators

When working through the assessment following the scoping stage, the geodiversity SEA objective was found to fit well as part of the biodiversity SEA objective, it was not adding value to score it individually with alignment in the topic of soils and land use as the main drivers. The climate change objective was also edited so that resilience to climate change could be assessed separately to the causes of climate change, which are now clearly included within the materials asset's objective. As such, the final SEA objectives are as follows:

Table 4.1.1 – SEA Topics and SEA objectives

SEA Topic	Overarching SEA objectives
Biodiversity and Geodiversity	Protect, conserve, and enhance biodiversity and geodiversity, including soils
Human Health	Protect, conserve, and enhance human health and well-being, including resilient communities
Socio-economic	Protect, conserve, and enhance social and economic prosperity
Carbon & Material Assets	Address the causes of climate change and manage and improve efficient use of resources, including embodied carbon, carbon emissions, emissions to air and waste generation
Water Resources	Protect, conserve, and enhance water resources
Flood Risk	Reduce and manage flood risk, increasing flood resilience
Heritage	Protect, conserve, and enhance the historic environment, including archaeology
Landscape	Conserve, protect and enhance the landscape, townscape, and visual amenity
Climate Change Resilience	Adapt, and improve resilience to climate change

Table 4.1.2 – SEA Framework - Guiding Questions

SEA Topic	Overarching SEA objectives	Guiding Questions
Biodiversity and Geo-diversity	Protect, conserve, and enhance biodiversity and geodiversity, including soils	Will it affect the conservation status of any internationally designated sites (Special Protection Areas, Special Areas of Conservation (SACs), Ramsar sites)? Will it affect the conservation status of any nationally designated sites (Sites of Scientific Interest (SSSIs)? Will it affect the conservation status of any other designated sites (local wildlife sites)? Will it contribute to biodiversity loss/ gain? Will it affect habitat connectivity/ fragmentation? Will it affect the freshwater or coastal environment, habitats, and species? Will it affect irreplaceable habitat such as ancient woodland? Will it affect the introduction or spread of INNS? Will it affect natural capital and the ecosystem services? Will it avoid damage to geologically important sites (e.g. geological SSSIs)? Will it protect and enhance the quality of soils? Will it protect, conserve, and enhance resources, such as high-quality agricultural land, sterilisation of mineral resources, soil erosion and nutrient loading of waterbodies? Will it promote the sustainable use of land, such as using previously developed land? Will it create contamination or contribute to remediation?
Human Health	Protect, conserve, and enhance human health and well-being, including resilient communities	Will it affect access to nature, particularly for those living within urban or deprived areas? Will it affect the environment for other users including for recreation, tourism and navigation? Will it affect human health and well-being through access to resilient, high quality, sustainable and affordable wastewater systems? Will it affect human health and well-being through access to a resilient, high quality, sustainable and affordable supply of water? Will it address specific customer concerns?
Socio-economic	Protect, conserve, and enhance social and economic prosperity	Will it affect opportunities for recreation and tourist activities? Will it affect economic development/ prosperity? Will it affect social deprivation and inequality? Will it affect important infrastructure (such as hospitals, roads, rail)?
Carbon & Material Assets	Address the causes of climate change and manage and improve efficient use of resources, including embodied carbon, carbon emissions, emissions to air and waste generation	Will it contribute towards net zero targets? Will it use natural rather than built solutions where appropriate? Will it make efficient use of existing infrastructure? Will it minimise the demand for resources during construction (such as through the use of soft engineering solutions rather than hard engineering solutions)? Will it minimise the demand for resources during operation (such as through avoiding pumping requirements)? Will it affect emissions of pollutants to air, including in sensitive locations (e.g. in proximity to an AQMA/ an ecologically sensitive site)? Will it affect waste generation, including hazardous wastes?

Water Resources	Protect, conserve, and enhance water resources	Will it enable better management of surface water before entering sewers? Will it affect coastal water quality (including bathing waters, shellfish waters)? Will it affect surface water quality or quantity? Will it affect groundwater quality or groundwater recharge? Will it affect drinking water or water abstraction zones? Will it contribute to or conflict with the achievement of WFD objectives (e.g. Good Ecological Status)? Will it affect contaminants entering the receiving environment? Will it reduce the volume and frequency of SOs?
Flood Risk	Reduce and manage flood risk, increasing flood resilience	Will it promote catchment-based, and Sustainable Drainage Systems (SuDS) based solutions? Will it affect the resilience of water and wastewater systems? Will it affect flood risk elsewhere? Will it affect sewer flooding events? Will it be vulnerable to flood risk itself?
Heritage	Protect, conserve, and enhance the historic environment, including archaeology	Will it affect archaeology, including unknown archaeology? Will it affect an historic designation/ feature? Will it affect the setting, the buffer, or significance of a historic designation/ feature? Will it affect access to important heritage assets within the region?
Landscape	Conserve, protect and enhance the landscape, townscape, and visual amenity	Will it affect designated landscapes and features, including National Parks and Areas of Outstanding National Beauty (AONBs)? Will it affect landscape character, including tranquillity and visual impact? Will it affect the townscape? Will it affect the seascape?
Climate Change Resilience	Adapt, and improve resilience to climate change	Will it help to restore the natural ecosystem function and promote resilience to climate change? Will it affect the environmental resilience of the water environment to climate change, flood risk and drought? Will it affect vulnerability to risks associated with climate change effects (e.g., reduce the adverse effects of droughts and floods, reduce the heat island effect)? Is it vulnerable to climate change?

4.2 Assessment Methodology

The DWMP has been assessed using the SEA framework above. The assessment indicates if the plan, the components of the plan, and their reasonable alternatives are likely to bring positive, negative, neutral, or uncertain effects in relation to the SEA objectives. Consideration is given to the likely significance of identified effects in accordance with Schedule I to the SEA Regulations (see below).

Criteria for determining the Likely Significance of Effects on the Environment (SEA Regulations, Schedule 1)

1) The characteristics of plans and programmes, having regard, in particular, to:

a) the degree to which the plan or programme sets a framework for projects and other activities, either with regard to the location, nature, size and operating conditions or by allocating resources;

b) the degree to which the plan or programme influences other plans and programmes including those in a hierarchy;

c) the relevance of the plan or programme for the integration of environmental considerations in particular with a view to promoting sustainable development;

d) environmental problems relevant to the plan or programme; and

e) the relevance of the plan or programme for the implementation of Community legislation on the environment (for example, plans and programmes linked to waste management or water protection).

2) Characteristics of the effects and of the area likely to be affected, having regard, in particular to:

a) the probability, duration, frequency and reversibility of the effects;

b) the cumulative nature of the effects;

c) the transboundary nature of the effects;

d) the risks to human health or the environment (for example, due to accidents);

e) the magnitude and spatial extent of the effects (geographical area and size of the population likely to be affected);

f) the value and vulnerability of the area likely to be affected due to— i) special natural characteristics or cultural heritage; ii) exceeded environmental quality standards or limit values; or iii) intensive land-use; and

g) the effects on areas or landscapes which have a recognised national, Community or international protection status.

The SEA process is concerned with likely significant effects, including the measures envisaged to prevent, reduce, and as fully as possible offset any significant adverse effects of implementing the plan. For the purposes of this appraisal, a significant negative assessment (indicated by a 'red' score within the appraisal matrix) is considered to be a

significant adverse effect; where the option is implemented by the plan, measures will be required to prevent, reduce, and offset the significant adverse effects.

The following terms are used in the appraisal:

- **Likely future without the plan**: if the plan is not adopted, the likely future based on the effects of other expected plans, projects, and underlying trends.
- **Secondary or indirect effects**: effects that are not the direct result of the plan but occur away from the original effect or as a result of a complex pathway.
- **Cumulative effects**: for instance, where several options each have insignificant effects but together have a significant effect; or where more than one policy in the plan have a combined effect.
- **Synergistic effects**: individual effects interact to produce a total effect greater than (or less than) the sum of their total effects.
- **Total effects of the plan**: the combined effects of all the polices within the plan.
- **Cumulative effects of the plan**: the total effects of the plan together with the likely future without the plan.
- **Cross border effects**: effects outside of the area.
- **Temporary effects**: effects that are not permanent, such as occur during construction. These may be short- to longer-term temporary effects.
- **Short term** (0-5 years), **medium term** (6-25 years), **long term** (25-40 years).
- **Certainty**: the level of surety of an effect.

The above types of effects have been considered when conducting the assessment and where relevant they are referenced in this report.

It is important to note that the assessment has been undertaken at the strategic level, in line with the nature of SEA and the DWMP. There will naturally be variation in the effects of the plan across the plan area as the receiving environment and the implementation of options vary.

5 OPTION DEVELOPMENT AND ASSESSMENT

5.1 DWMP Process and Compatibility with the SEA

The DWMP has been produced following a risk and benefits-based approach, following the guidance provided in the DWMP Framework set out in **Chapter 1** and summarised in **Figure 1.3.1** and **Table 1.4.2**. This process is expanded upon in **Table 5.1.1** below, including setting out the factors considered in the development of the DWMP.

Table 5.1.1 – DWMP Framework Process

DWMP Stage	Overview
Risk Based Catchment Screening (RBCS)	This stage prioritised catchments for further investigation. This initial screening stage considered 20 criteria, with prioritisation given to the following criteria: • Bathing or Shellfish Waters • Discharge to Sensitive Waters (Part A) • Storm Overflow Assessment Framework (SOAF) • Internal Sewer Flooding • External Sewer Flooding • WwTW Effluent Quality Compliance • WwTW Dry Weather Flow (DWF) Compliance • Storm Overflows • Planned residential development
Baseline Risk and Vulnerability Assessment (BRAVA)	Hydraulic modelling to determine the existing performance of catchments and analyse the potential impacts of future pressures such as growth, urban creep and climate change. Results are assessed against the DWMP's Planning Objectives which are set out below: <u>Flooding</u> • *PO 1 – Reduction in Internal Property Sewer Flooding risk as a result of hydraulic incapacity* • *PO 2 – Reduction in External Property Sewer Flooding risk as a result of hydraulic incapacity* • *PO 3 – Reduction in total population at risk of Sewer Flooding 1 in 50 year storm; supporting Risk Management Authorities delivery* <u>Environmental</u> • *PO 4 – Reduction in risk of detriment to Bathing Water Quality through intermittent discharges* • *PO 5 – Reduction in risk of detriment to River Water Quality through continuous and intermittent discharges* • *Compliance* • *PO 6 – Reduction of non–compliance risk that could lead to potential Pollution* • *PO 7 – Reduction of risk resulting from poor Asset Health* • *PO 8 – Improvement in Wastewater Treatment Works and Intermittent Discharge Permit Compliance"*

Problem Characterisation	Identify the level of risk and potential benefits within a catchment to inform option development. Consideration is given to flooding, SOs, pollution, WwTW dry weather flow (DWF) compliance.
Option Development and Appraisal (ODA)	Identify the hierarchy of options available to address the issues identified in the Problem Characterisation stage; appraise and shortlist options to determine the most preferred approach based on 'best value'. The assessment includes consideration of: • The option costs. • The whole life option benefits including internal property sewer flood risk reduction (PO 1), external property sewer flood risk reduction (PO 2), non-compliance pollution risk reduction (PO 6), surface water run-off separation volumes, SO spills to the environment, health benefits from reduced flood risk, street greening, biodiversity, and more.
Programme Appraisal	Select options for delivery and their timelines, taking into account regulatory and ambitious targets.

The DWMP process itself provides a good coverage of the SEA topics, particularly in relation to water resources, flood risk, climate resilience and biodiversity – reflecting the nature of the plan and its objectives for flood risk, the (water) environment and compliance. The assessment shows less consideration of the historic environment and landscape than other SEA topics, again reflecting the nature of the plan. These topics are however considered through the SEA and will be subject to the usual development management controls as the plan is implemented hence this is not considered to be an issue. The analysis also shows less consideration of carbon and material assets through the assessment, than for other SEA topics. This is an area which could be developed further within subsequent iterations of the plan. Overall, the SEA topics are well covered within the DWMP development process, demonstrating integrated consideration of the SEA themes throughout the plan production.

5.2 Option Development and Consideration of Reasonable Alternatives

The DWMP Option Development and Appraisal stage identified the generic options available to address the identified issues, and appraised and shortlisted the options to determine the most feasible options. These options assume a 'business as usual' case, where for example drains are cleaned as necessary and sewers are repaired; as such these are not considered within the DWMP options.

These options were reviewed by the SEA team to ensure all reasonable alternatives were being considered. Following discussion, the following changes were made to the options:

- Widened the scope of the option 'influence customer behaviour' to include surface water run-off from households and organisations, such as increasing rainwater reuse through water butts and use of permeable paving. Clarification that this option includes both domestic and non-domestic customers.
- Expanded the example of SuDS features to include permanently wet options such as ponds, in addition to those that may be dry outside of high flow events.
- Reordered the grey options within the hierarchy.

Following discussion, the following options were not considered to be reasonable alternatives and were not considered further at this stage:

- Disinfection (such as ultraviolet radiation) of SO discharges to reduce harmful pathogens to bathing waters, as suggested within the headline target of the SODRP

consultation. The focus has instead been on removal of SOs or reducing the frequency of SO discharges to meet the Environment Agency spill standard by 2035. Disinfection is energy intensive, has a high capital cost and requires a large area of land. Further consideration may be given to disinfection within later DWMP cycles if the 2035 target cannot be met.

- Installation of screens on SOs to limit the discharge of persistent inorganic material as well as faecal and organic solids. The SODRP consultation sets out these will be required by 2050. The current focus is on removal of SOs that cause harm, thus eliminating the need for a screen. Further consideration will be given to the installation of screens within later DWMP cycles once it is known which SOs will remain in use.
- Resilience to sewer flooding, including:
    - Flood resilience of NWG assets that are too critical to fail (such as pumping stations) is considered separately, outside of the DWMP.
    - Flood resilience within the community, such as Property Level Protection (PLP) for homes and businesses is not considered to be a reasonable alternative within the DWMP. Sewer flooding occurs quickly, limiting the ability to implement such measures effectively. There is a preference for strategic preventative measures within the plan, in place of these short-term reactive measures.
- Catchment management in relation to nutrient load is beyond the scope for the first DWMP as it is typically considered by water companies in relation to drinking water quality. However, this issue has increased in profile recently in relation to the need to demonstrate 'nutrient neutrality' within plans and projects to demonstrate there is no net increase in nutrients so that they do not add to existing nutrient burdens at certain sites. Within the plan area, these sites include Roman Walls Loughs SAC and Teesmouth & Cleveland Coast Special Protection Area. Applications for land uses which might impact upon the wastewater system are affected, including applications for new homes. At this stage this is considered outside of the scope of the DWMP, however this situation will need to be kept under review. Consideration will be given to inclusion of this issue within later DWMP cycles. Catchment management in relation to flows is however within the scope.

Further options may develop over the long-term horizon of this plan as a result of advancing science and technology and societal changes. These will need to be considered within the five-year DWMP review cycle.

The options considered by the DWMP are set out in **Table 5.2.1** below:

Table 5.2.1. – Options considered in the DWMP

Options	Description and example options
Management Options	
Influence customer behaviour	This option aims to reduce water consumption (and thus discharge) and increase rainwater re-use and reduce run-off by households and organisations to relieve pressure on the wastewater network and treatment works. e.g., low flow cisterns, water-butts, grey water reuse, permeable paving, rain water harvesting systems, green roofs.

Smart networks	Intelligent network operation, including monitoring and management measures. e.g., real time weather monitoring linked to sewer flow management.
Working in partnership	Working in partnership with others (such as other flood management authorities and wider organisations), to implement programmes with multiple benefits beyond those directly relevant to NWG. e.g., working in partnership with a highway authority to implement a SuDS scheme which reduces both highway flooding and the spill frequency at SOs.
Green Options	
Catchment management*	This option can apply at the strategic level across a catchment/ catchments, including consideration of upstream and downstream catchments. It provides natural flood management by holding back flows in the upstream parts of a catchment through rural land management to prevent overland flows/river flows impacting the downstream catchment. e.g., reducing artificial drainage in an upland area.
Blue/ green corridors*	Multi-functional corridors providing drainage through SuDS to attenuate runoff before it enters the sewer network (and groundwater), typically also providing access routes and green spaces. e.g., greening up a city centre thoroughfare with above-ground SuDS features and planting.
SuDS features*	SuDS features mimic natural processes, holding back surface water runoff on the surface, promoting infiltration to groundwater and discharge to watercourses in preference to discharge to the sewer network. This option covers individual features (as opposed to corridors). e.g., SuDS attenuation basin which will be dry outside of high flow events, ponds/ wetlands.
Traditional/ Grey Options	
New surface water sewers*	Separation of surface water flows through engineered solutions to take runoff out of the combined sewer network. e.g., provision of a new surface water sewer network.
Below-ground storage	Retention of flows within engineered below ground storage to hold large volumes of runoff on both combined and surface water networks. Typically located online, or in close proximity to the existing sewer network. e.g., concrete tanks.
Sewer upsizing	Increasing the capacity of sewers over a significant length to convey flows forward to the downstream network where there is capacity. This may include upsizing an existing sewer or installing a parallel adjacent sewer. e.g., replacement of existing sewers with larger diameter sewers.
Flow transfer	Diversion of flows from one system to another through provision of a new sewer. e.g., diverting flows from one system to another through new gravity or pumped networks.

WwTW rationalisation	WwTW rationalisation, comprising: • Decommissioning a WwTW • Flow transfer (see option above) • Upgrading another WwTW (see option below) e.g., decommissioning a sewage treatment works and pumping flows to a nearby WwTW for treatment.
WwTW upgrade	Upgrades to existing WwTW to provide additional treatment/storm storage capacity. e.g., increasing storm tank storage provision at a WwTW to maintain/reduce storm discharges to the environment in the future.
Storm Overflow (SO) rationalisation	SO rationalisation, comprising: • Decommissioning an SO • Flow transfer (see option above) • Discharge through another downstream SO e.g., abandoning one SO and modifying another nearby so that there is one spill to the environment instead of two.

*In addition to these options, NWG have considered a hybrid green/ grey approach of **Surface Water Management** within catchments, which would be achieved through the combination of several of these options:

- Catchment management
- Blue/ green corridors
- SuDS features
- Short sections of new surface water sewers

5.3 Level 1 SEA Assessment of Options

The options have been first assessed across the Level 1 plan area using the SEA framework and guiding questions (**Table 4.1.2**). Results are presented in **Table 5.3.1** below, with narrative supporting the assessment provided in **Table 5.3.2**.

Assessment key:

Major positive	+ + +	Moderate positive	+ +	Minor positive	+	Neutral	0
Major negative	- - -	Moderate negative	- -	Minor negative	-	No relationship	

Table 5.3.1 – Assessment of options using SEA framework (generic to the whole DWMP area/ Level 1)

Level 1 Study Area

Option		*Protect, conserve, and enhance biodiversity & geodiversity, including soils*	*Protect, conserve, and enhance Human Health and well-being, including resilient communities*	*Protect, conserve, and enhance social and economic prosperity*	*Address causes of climate change, manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation*	*Protect, conserve, and enhance water resources*	*Reduce and manage flood risk, increasing flood resilience*	*Protect, conserve, and enhance the historic environment, including archaeology*	*Conserve, protect and enhance the landscape, townscape, and visual amenity*	*Adapt, and improve resilience to climate change*
	Options	**Biodiversity**	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
	Influence customer behaviour	+	0	+	+ + +	+ +	+			+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Catchment management	+ +	0	-	+ +	+ +	+ +?		+ +	+ +
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +?	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	New surface water sewers	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	WwTW rationalisation	0	+	+	+	+ +	+	0	0	-
	WwTW upgrade	-	-	0	-	+	-	-	-	+
	SO rationalisation	0	0		0	+	-			0

Table 5.3.2 – Narrative supporting the assessment of options using SEA framework (generic to DWMP area)

Options	Description and example options	Assumptions made for assessment and discussion of SEA findings
Management Options		
Influence customer behaviour	This option aims to reduce water consumption (and thus discharge) and increase rainwater re-use and reduce run-off by households and organisations to relieve pressure on the wastewater network and treatment works. e.g. low flow cisterns, water-butts, grey water reuse, permeable paving, rain water harvesting systems, green roofs.	This option is assessed on the basis it aims to reduce flow to the sewer network (both domestic and non-domestic flows). The option is primarily driven on an optional (stakeholder buy in) type model, leading to cost-savings for those on a water meter, rather than imposition of high-cost requirements to customers. The option factors in a range of cost options, with a preference towards low-cost measures (such as water-butts), particularly for existing developments. Therefore, inclusivity is somewhat inherent in the option type, which is relevant within the assessment against the socio-economic SEA objective, providing particular benefit to those in deprivation (assuming they are metered and noting that not all customers are likely to be metered by 2030). As such, levels of deprivation across catchment types, influences the socio-economic score for this option. This option also includes more substantial measures such as permeable paving, rainwater harvesting systems, green roofs and grey water reuse. Such measures may be feasible both in new development, and in some instances by retrofitting. Whilst these may be outside the direct control of NWG, NWG will have some influence through partnership working (such as through local authority planning policy) and direct promotion of such measures with customers. The intention of this option is to reduce flows to the sewer network and WwTWs, reducing SO discharges by allowing an increased proportion of sewerage to be treated within the capacity of WwTWs, thus improving water quality. See note on potential cumulative effect below*. This option assesses positively in terms of addressing the causes of climate change and material assets (noting that some measures may require increased resource use to implement, however they would reduce water consumption), water and flood risk. In areas of deprivation, there is a minor positive effect from these measures for metered customers in instances where low-cost retro fit measures are implemented and where wider measures are implemented within new developments. It assesses positively in terms of resilience to climate change through reducing water consumption as pressure on resources increases.
Smart networks	Intelligent network operation, including monitoring and management measures. e.g. real time weather monitoring linked to sewer flow management.	The option is assessed on the basis that no, or minimal, materials and construction are required, and that it aligns more with green options than grey options. It provides the opportunity to manage flows, for example by diverting flow away from a SO when a storm is imminent to available downstream capacity for storage or treatment. As such it provides benefits for water quality, flood risk, climate resilience and material assets through more effective use of existing assets, without the requirement for substantial network changes. In this way, it helps to address the causes of climate change and supports resilience to climate change.
Working in partnership	Working in partnership with others (such as other flood management authorities and wider organisations), to	Whilst this approach would effectively implement other options within the DWMP (which are each individually assessed), working in partnership increases the potential to implement options which are multi-functional, providing a wide range of benefits beyond just those relevant to drainage. For example, green infrastructure may be able to provide flood alleviation along with open spaces and active travel routes and biodiversity improvements, which allow efficient use of land, help to combat the urban heat island

	implement programmes with multiple benefits beyond those directly relevant to NW. e.g. working in partnership with a highway authority to implement a SuDS scheme which reduces both highway flooding and the spill frequency at SOs.	effect, enhance townscapes, and provide efficiency in relation to resource use. The full suite of benefits would be unlikely to be able to be delivered within the scope of a drainage only scheme. Given the potential for wide ranging benefits, this approach appraises positively across all the SEA objectives (noting that there will be some variation depending on the nature of the options implemented in partnership). **For this reason, this approach is not assessed further within each catchment type.** Typically, partnership working requires a longer lead in time.
Green Options		
Catchment management	This option can apply at the strategic level across a catchment/ catchments, including consideration of upstream and downstream catchments. It provides natural flood management by holding back flows in the upstream parts of a catchment through rural land management to prevent overland flows/river flows impacting the downstream catchment. e.g. reducing artificial drainage in an upland area.	This option is assessed on the basis that it will be undertaken within rural areas (including those catchments categorised as rural), including upstream of the catchments being investigated. It is a green option and assessed on the basis that it is not resource intensive to implement. It aims to increase retention of water within upstream catchments, reducing runoff and therefore flood risk directly. The intention of this option is to reduce surface water and river flows to catchments and within catchments, to reduce surface water flows entering the sewer network and subsequently WwTWs. This reduces SO discharges by allowing an increased proportion of sewage to be treated within the capacity of WwTWs, thus improving water quality. See note on potential cumulative effect below*. The volume of wastewater requiring treatment also reduces. This option potentially provides opportunity to slow the rate of drainage, including of important habitats, contributing to rewilding. It can lead to substantial habitat creation/restoration/improvement and is likely to benefit soils (including their carbon storage and sequestration capacity). The application of this option across large areas provides the opportunity to support a natural landscape, supporting natural ecosystem functions. More detailed consideration of the potential for this opportunity in relation to the most important habitats within Special Protection Areas and SACs is being considered within the HRA. Slowing the rate of drainage promotes natural flood risk reduction and thus climate resilience. However, at the current time, catchment management provides less certainty of the level of flood risk reduction which can be achieved, when compared to the traditional grey infrastructure options. There is a potential for conflict with land uses, such as farming which could limit use of the option, or potentially have socio-economic effects - case by case consideration is required. It helps to address the causes of climate change (through support of natural rather than built solutions, and soil carbon storage) and promotes resilience to climate change (in terms of supporting biodiversity and managing water flows).

		This option requires partnership working, such as with landowners and potentially others such as Natural England and as such requires a longer lead in time.
Blue/ green corridors	Multi-functional corridors providing drainage through SuDS to attenuate runoff before it enters the sewer network (and groundwater), typically also providing access routes and green spaces. e.g. greening up a city centre thoroughfare with above-ground SuDS features and planting.	This option is assessed on the basis it is a green option and that it can be implemented in all catchment types (rural and urban). Blue/green corridors provide multi-functional spaces offering management of surface water flows along with active travel routes (such as footpaths and cycle paths), typically within a planted setting. In terms of drainage, they slow the flow of, and retain surface water, before its infiltration to the ground, discharge into watercourses or if necessary, sewer; they reduce the total flow and peak flows within the sewer network and to WwTWs, reducing the frequency and extent of SO discharges, thus offering water quality improvements. The volume of wastewater requiring treatment also reduces. See note on potential cumulative effect below*. Slowing the rate of drainage promotes natural flood risk reduction and thus climate resilience. However, at the current time, blue/ green corridors provide less certainty of the level of flood risk reduction which can be achieved, when compared to the traditional grey infrastructure options. The multi-functional nature of blue/green corridors provides opportunities in terms of human health and well-being, amenity, and biodiversity. In urban areas they help to counter the urban heat island effect, improving resilience to climate change. Typically, they are not resource intensive to construct, operate or to maintain, providing nature-based solutions. Whilst negative impacts to groundwater and surface water are possible with SuDS features as a result of pollutants in the drainage water, it has been assumed that SuDS would be developed in line with Northumbrian Water's SuDS Policy Document (currently in draft) in relation to water quality. This identifies low risk (e.g., small residential developments), medium risk (e.g. commercial areas) and high risk areas (e.g. industrial estates), where increasing levels of pollution mitigation are required, such as use of multiple SuDS to provide a series of measures to treat runoff. This may limit the ability to apply such measures within the higher risk areas. This option requires an integrated approach with other land uses and partnership working, such as with landowners, local authorities, and developers and as such requires a longer lead in time.
SuDS features	SuDS features mimic natural processes, holding back surface water runoff on the surface, promoting infiltration to groundwater and discharge to watercourses in preference to discharge to the sewer network. This option covers individual features (as opposed to corridors).	This option is assessed on the basis that it is a green, SuDS based option, designed for both water quality and quantity improvement. Typically, there will be less opportunities for multi-functional provision with individual SuDS features than the larger scale blue/green corridors, however they assess positively in terms of material assets (assumes low carbon construction and minimal maintenance), biodiversity (likely to provide biodiversity gains – depends on nature of implementation), provide health and social benefits through improved environment, and climate resilience. In terms of drainage, they slow the flow of, and retain surface water, before its infiltration to the ground, discharge into watercourses or if necessary, sewer; they reduce the total flow and peak flows within the sewer network and to WwTWs, reducing the frequency and extent of SO discharges, thus offering water quality improvements. The volume of wastewater requiring

	e.g. SuDS attenuation basin which will be dry outside of high flow events, ponds/ wetlands.	treatment also reduces. See note on potential cumulative effect below*. Slowing the rate of drainage promotes natural flood risk reduction and thus climate resilience. It has been assumed that SuDS would be developed in line with Northumbrian Water's SuDS Policy Document (currently in draft) in relation to water quality. This identifies low risk (e.g. small residential developments), medium risk (e.g. commercial areas) and high risk areas (e.g. industrial estates), where increasing levels of pollution mitigation are required, such as use of multiple SuDS to provide a series of measures to treat runoff. This may limit the ability to apply such measures within the higher risk areas.
Traditional/ Grey Options		
New surface water sewers	Separation of surface water flows through engineered solutions to take runoff out of the combined sewer network. e.g. provision of a new surface water sewer network.	This green-grey option would reduce the total volume of water entering the sewer network and requiring treatment by preventing surface water flows entering the sewer. This option reduces flows through the sewer network, thus reducing the risk of sewer flooding; and reduces flows to WwTWs, substantially reducing SO discharges by allowing an increased proportion of sewage to be treated within the capacity of WwTWs, thus improving water quality. See note on potential cumulative effect below*. There is a risk that provision of further surface water systems will increase the conveyance rate to receiving watercourses, potentially increasing the subsequent fluvial flood risk. Where this option is prioritised for further investigation, flood risk will be considered further and a such this is noted as a minor negative. The construction of a new surface water sewer system would be disruptive and would require careful routing, planning and construction to reduce adverse effects to the environment (such as to biodiversity, heritage, nuisance), although there would be no direct effect on these topics during operation. It would also require a large volume of resources for construction, although it would require few resources during operation and may reduce resource use at WwTWs where the volume of flow to be treated would be reduced through by the removal of flows. Beyond the benefits in relation to flood risk, there would be no particular effects in relation to human health or socio-economics in the long term (beyond the nuisance issues during construction) which assess as neutral against these SEA objectives.
Below-ground storage	Retention of flows within engineered below ground storage to hold large volumes of runoff on both combined and surface water networks. Typically located online, or in close proximity to the existing sewer network. e.g. concrete tanks.	This option reduces peak flows through the sewer network, thus reducing the risk of sewer flooding; and reduces peak flows to WwTWs, reducing SO discharges by allowing an increased proportion of sewage to be treated within the capacity of WwTWs, thus improving water quality. However, the increase in the treatment of wastewater, will increase resource use within WwTWs; depending on the scale of this option, this could require the provision of new or expanded WwTWs. This option is assessed on the basis that it is a grey option that will be constructed of concrete/ a similar material and require the use of pumps during operation to empty the storage after high flow events. However, it is assumed to be smaller in scale than other options such as flow transfer. Through provision of flow storage, it would provide some resilience to climate change. The construction of below ground storage will be disruptive locally on a temporary short-term basis. It will require careful siting, planning and construction to reduce effects to the environment (such as biodiversity, heritage, nuisance). Where storage is

		located online and thus typically within previously disturbed ground, often in the highway, the potential effect on buried archaeology and biodiversity is lower, although the effect is likely to increase when locating storage locally where these issues may have higher sensitivity, such as adjacent to SOs and thus watercourses. From a landscape perspective, it is assumed to be located below ground, therefore with no long-term landscape effects. Beyond the benefits in relation to flood risk, there are no particular effects in relation to human health or socio-economics which assess as neutral against these SEA objectives. However, this will depend on the reinstatement provided. This option effectively sterilises land from development, however the post-construction reinstatement may be able to provide beneficial uses, such as public access.
Sewer upsizing	Increasing the capacity of sewers over a significant length to convey flows forward to the downstream network where there is capacity. This may include upsizing an existing sewer or installing a parallel adjacent sewer. e.g., replacement of existing sewers with larger diameter sewers.	The intention of this option is to increase conveyance of wastewater to the downstream network where there is treatment capacity, thus reducing sewer flood risk in the upstream parts of the network. This grey option has been assessed on the basis it will require a large amount of material within construction and that no pumping will be required, given the scale of construction works, this is assessed as negative. Through provision of increased flow capacity, it would provide some resilience to climate change. Given the replacement of existing sewers, or parallel placement of new sewers, this option would typically be constructed in previously disturbed ground and often within the highway, lowering the potential for disturbance such as to buried archaeology and biodiversity in these circumstances. However, this option is likely to involve relatively large-scale works, increasing the potential for issues. From a landscape perspective, it is assumed to be located below ground, with no long-term landscape effects. Beyond the benefits in relation to flood risk, there are no particular effects in relation to human health, socio-economics, or climate change which assess as neutral against these SEA objectives
Flow transfer	Diversion of flows from one system to another through provision of a new sewer. e.g. diverting flows from one system to another through new gravity or pumped networks.	This grey option is assessed on the basis that energy/ pumps will be required and that gravity will not be feasible, which it could be for some catchments. The provision of a new sewer may be located using a greenfield route. Effects associated with the subsequent operation of treatment works (or SOs) on completion of the flow transfer, are considered within the other options. The construction of a new sewer system will be disruptive and will require careful routing, planning and construction to reduce effects to the environment (such as biodiversity, heritage, nuisance). It creates the potential for transfer of Invasive Non-Native Species (INNS) from one catchment to another. It will also require large quantities of resources within construction, with assumed pumping during operation. Beyond the benefits in relation to flood risk, there are no particular effects in relation to human health, socio-economics, or climate change resilience which assess as neutral against these SEA objectives.
WwTW rationalisation	WwTW rationalisation, comprising:	This option is assessed on the basis that an existing WwTW site is decommissioned, rather than demolished (mothballed) and therefore that minimal remediation and demolition will be undertaken.

	• Decommissioning a WwTW • Flow transfer (see option above) • Upgrading another WwTW (see option below) e.g. decommissioning a sewage treatment works and pumping flows to a nearby WwTW for treatment.	Most WwTW sites have some negative effect in terms of odour and noise, which would see benefits locally; thus, this option assesses positively for human health and socio-economics. Whilst WwTWs often have some visual impact, decommissioning of works is unlikely to have a landscape effect, thus the option is neutral in terms of landscape effects. This option could provide a source of brownfield land which could subsequently provide a variety of benefits, such as biodiversity enhancements, alternative beneficial uses such as for recreation, or redeveloped for other uses such as housing. Whilst this opportunity exists, it is not typically taken forward in the region and as such has not been taken into account within the scoring. Operation of one WwTW rather than two may pose opportunities for increased efficiency. As such this option is a minor positive in terms of carbon and material assets. Removal of a WwTW may reduce the ability to respond to climate change in the future. There is no direct effect in terms of climate adaptation or resilience.
WwTW upgrade	Upgrades to existing WwTW to provide additional treatment/storm storage capacity. e.g. increasing storm tank storage provision at a WwTW to maintain/reduce storm discharges to the environment in the future.	The option is based on a new WwTW, or upgrades to an existing WwTW to address population growth. It would also likely be implemented in combination with the WwTW rationalisation and flow transfer options. This option is assumed to provide greater efficiency during operation (in terms of energy, chemical use etc.) and to be designed with increased resilience to flood risk from climate change. However, it will be resource intensive during construction. Provision of increased storm tanks at the WwTW would reduce peak flows to allow an increased proportion of sewage to be treated prior to discharge. Similarly, provision of increased treatment capacity would allow an increased proportion of sewage to be treated prior to discharge. Where this option is combined with an increased flow to the works (e.g., due to rationalisation of another works and/or flow transfer), it would result in increased flows to the receiving watercourse. Given the permitting requirements relating to WwTW discharges, and the intent of this option, it is assumed that this would result in improvements to water quality. However further detailed consideration would be required. Similarly, increased flows to a works may increase the subsequent fluvial flood risk in the receiving watercourse – this requires further consideration. Whilst some upgrades may be able to be accommodated within the existing footprint/disturbed ground within a works, others may involve loss of greenfield land, with associated ecological, heritage and landscape impacts. There may be some increase in odour, noise, and visual impact at the works, depending on the local sensitivity and scale of changes.
SO rationalisation	SO rationalisation, comprising: • Decommissioning a SO • Flow transfer (see option above) • Discharge through another downstream SO	This option has been considered a grey option. It is assessed on the basis of other measures reducing water flows through the sewer network to enable a SO to be decommissioned, providing water quality benefits to a section of the receiving watercourse. Within the assessment it is assumed that flows would pass through the sewer network from which they may potentially discharge during high flow events to the same watercourse (albeit downstream) through an existing downstream SO. Whilst the total volume of spill to the environment would not increase (and should decrease in combination with other measures), the point loading at the retained SO could increase. As such this option assesses neutrally in terms of water quality, and potentially negatively in terms of flood risk which requires further consideration in relation to the retained SO (noting that NWG would not take this option forward if the measures were found to be unacceptable in terms of flood risk). This option may be able to be targeted to river stretches which are RNAGS as a result of SO discharges.

	e.g. abandoning one SO and modifying another nearby so that there is one spill to the environment instead of two.	A secondary consideration is that SO removal, in some low flow circumstances, can lead to the drying up of some watercourses, mitigating the benefits of removal. It is not possible to assess where this would occur within the strategic nature of the SEA, and it thus requires further consideration before being taken forward. Use of this option in combination with catchment management, blue/green infrastructure and SuDS based options may address the causes of low flow to some extent through slowing the flow of water through the environment thus sustaining river flows over a longer period. This option is assumed to require no / very limited construction or operational resource use so assesses neutrally in terms of material assets. It is assumed to have no effect on heritage or landscape and assesses neutrally in terms of human health and socio-economics.

* Reducing the flows of water to WwTWs will reduce the frequency and extent of SO discharges, thus improving water quality with subsequent benefits for biodiversity and human health. The reduced flow of water to WwTWs, will increase the concentration of pollutants entering WwTW's. There is a risk that this increase could go beyond the optimal level for treatment (such as biological treatment). As such the cumulative reduction in flows to WwTWs through the options of influencing customer behaviour, catchment management, blue/ green infrastructure, SuDS and new surface water sewers should be reviewed. These risks may be able to be overcome through changes to the treatment process. In terms of the subsequent discharge to rivers, and the potential for low flows during dry periods, a reduced flow from WwTWs from such measures may be offset when implementing catchment management, blue/green corridors and SuDS which increase infiltration to ground, supporting the natural hydrogeological processes and thus river baseflows.

5.4 Level 2 Catchment SEA Assessment of Options

As proposed within the SEA Scoping Report, L3 catchments have been categorised both by their spatial location within an L2 SPA, and also by the catchment type for the purposes of meaningful assessment. The following section sets out how catchments were categorised in order to assess environmental and social impact.

5.4.1 Assessment Output

Table 5.4.1 explains how the catchments scored differently per SEA Topic in the assessment matrices. The full results of the Level 2 Assessment Matrices can be found in **Appendix D**.

Table 5.4.1 – Explanation of catchment classification variation

SEA Topic	Overarching SEA objective
Biodiversity & Geodiversity	Protect, conserve, and enhance biodiversity and geodiversity, including soils
Differentiation between catchment types is perhaps most obvious in the rural vs urban nature of the classification with a final category of Suburban Fringe added to reflect those catchments with an even split between urban and rural land use. Historic Urban varies and is largely driven by the type of historic area, for example small market towns are in contrast to city centre catchments in Newcastle or Sunderland. These city centre catchments tend to perform worse for biodiversity levels and for access to them for local residents. Coastal urban areas across Northumberland often provide access to areas of high-quality biodiversity, such as protected sites for example SACs or SSSIs. Likewise, Ramsar sites are frequently found in estuarine environments given their context as a wetland based European designation. Industrial Urban catchments, and some city centre Historic Urban catchments usually scored the lowest compared to the other four catchment classifications (Coastal Urban, Lowlands Rural, Uplands Rural, and Suburban Fringe). Differences between Level 2 SPAs are driven by the designations applicable to them, for example if they fall within national parks. There is a high number of designated areas for biodiversity/ geodiversity within rural Level 2 SPAs. However**,** not many of these directly intercept the Level 3 catchments that have been identified to be taken forward for optioneering. The more urban SPAs tend to have fewer designated areas, but a number do intersect, or are in close proximity, to the Level 3 catchments identified for optioneering. A number of these designations are for coastal or estuarine areas which are the furthest downstream extent of the study area and therefore may have most potential to be impacted by negative drainage and wastewater impacts. Specific catchment variation within each SPA is driven by multiple factors. One example is the variation between historic areas. Some L2 SPAs have large city centre urban areas, whilst other SPAs have small market towns/ villages or small populated areas with high heritage value.	
Human Health	Protect, conserve, and enhance health and well-being, including resilient communities
Differences between catchment types are driven by a couple of factors. The first being open, green spaces which are shown to both increase physical and mental well-being. Rural catchments and the Suburban Fringe tend to score highest for this category when compared to the urban categories. The coastal urban category also scores higher when compared to the other two urban categories as the coastal areas across Northumbria generally provide good access to open spaces. Another factor is levels of deprivation with variation across the catchments as more deprived areas correlate to areas with higher levels of unemployment, lower average age, and other criteria measured within the indices of multiple deprivation. Differences between SPAs are driven by the generalised land uses within. Tyneside, Wearside, and Teesside are all relatively urban areas, especially compared to Teesdale, Northumberland, and Rural Tyne. The absence of large towns or cities has benefits for green, open spaces and their accessibility.	
Socio-economic	Protect, conserve, and enhance social and economic prosperity

Differentiation between L2 SPAs and catchment types within are largely driven by the indices of multiple deprivation. There is potential for more benefits from green options in those catchments with less green, open space and also less ability to change customer behaviour. Customer behaviour options can be both low and high cost, an example of a high cost one could be a new washing machine which uses less water. Residents of areas of higher deprivation are less likely to be able to pay for measures with a high capital cost, even if they lead to monthly savings on water or energy usage.

Carbon & Material Assets	Address the causes of climate change and manage and improve efficient use of resources, including embodied carbon, carbon emissions, emissions to air and waste generation

Differentiation was not made between catchment types or L2 SPAs for this SEA topic. The carbon and material asset effects of the various proposed options do not tend to vary based on their location, with carbon being a global issue.

Rather, differentiation is made per option and assumed to be the same across all catchment types. Grey options tend to score more negatively given the embedded carbon in their construction; some options also require pumping which also increases the level of carbon emissions through the operational phase of the option. The SEA topic of climate change resilience has more variation based on both the spatial location and the option types.

Water Resources	Protect, conserve, and enhance water resources

Differentiation between catchment types and Level 2 SPAs is difficult to assess accurately in the regional context. Water quality is more important for certain catchments (rather than certain catchment types) e.g., where discharge takes place to sensitive waters. Therefore, differences are too detailed to be identified in the strategic context of SEA. However, it can be assumed that options will not be taken forward unless they generate positive benefits for water resources as this is one of the main DWMP drivers.

Water resources are important across all areas; however, some areas have increased sensitivity as a result of the presence of Source Protection Zones (SPZ), or the presence of an ecological designation with hydrological influences, e.g., a Ramsar designated wetland.

Flood Risk	Reduce and manage flood risk, increasing flood resilience

Differentiation is limited between catchment types in relation to flood risk at this regional scale. However, the impact of flooding is flooding may increase in areas of deprivation where residents are less likely to have home insurance and be able to respond to flood damage. Reference should therefore be made to the socio-economic topic area. Funding for flood risk, or flood risk economics, is often driven by economic benefits, which are likely to be greater in urban catchments than rural catchments, due to the higher number of properties at risk of flooding. This means that partnership working is likely to be focused on more urban areas, and often towards areas of higher deprivation where schemes can obtain a higher percentage of government funding.

Differentiation between Level 2 SPAs is limited because all SPAs have areas at risk of flooding (surface water and fluvial). Some Coastal Urban catchments have an additional risk from coastal flooding; however, this is unlikely to be significant in the context of the DWMP and the options likely to be generated from it, and therefore assessment rarely changes between urban and coastal locations for this issue specifically. For other sources of flood risk, generalisations cannot easily be made at the catchment type scale. As such, differentiations have not been made for this topic between catchment types.

Heritage	Protect, conserve, and enhance the historic environment, including archaeology

Differentiation between catchment types is largely driven by major heritage designations. The catchment classification includes a Historic Urban classification which makes the assessment of urban areas more straightforward. These areas tend to be historic market towns; central parts of cities with high heritage value; or coastal/estuarine settlements that have developed from early settlement. All of these classifications share certain constraints such as access issues or direct impact on valued heritage assets, or their setting. Rural catchments include small villages where there can be heritage assets but usually not at the same scale as the urban catchments. There is potential for unknown archaeological assets across all catchments, especially in areas where there are registered battlefields or a high density of known assets such as Scheduled Monuments.

Differentiation between Level 2 SPAs is largely driven by major heritage designations. For example, Hadrian's Wall World Heritage Site intersects large parts of a couple of SPAs, such as Tyneside and Rural Tyne. Some of this has been identified within the catchment classification and some within the comparison of SPAs.	
Landscape	Conserve, protect and enhance the landscape, townscape, and visual amenity
Differentiation between catchment types and Level 2 SPAs is largely driven by major landscape designations. Examples of these designations includes: AONB; National Parks; green belt and conservation areas. Greater value is placed on the designations with most restrictions such as National Parks which mostly intersect rural areas, although some urban areas are within/close to these designations. Historic Urban catchments quite often have a conservation area designation as they are associated with heritage, often driven by landscape and in particular townscape qualities.	
Climate Change Resilience	Adapt, and improve resilience to climate change
Differentiation is limited between catchment types in relation to resilience to climate change at this regional scale. Consideration of coastal locations is inherent in the classification of L3 catchments and flood risk is a separate SEA topic. Urban heat island effect is considered within certain urban catchment classifications and is focused on major settlements such as Newcastle, Sunderland, and Middlesbrough, where this impact could be most prevalent. Differentiation between Level 2 SPAs is limited due to climate data being regional or national in scale.	

6 ASSESSMENT OF THE SELECTED NW DWMP

6.1 Overview of the Preferred Approach in the Draft DWMP

Risk Based Catchment Screening identified 332 out of 478 drainage areas (L3s) as breaching one or more of the screening criteria, which were further screened to 257 drainage areas requiring a BRAVA (hydraulic modelling) to be undertaken. Of the 221 drainage areas identified as being low priority for interventions, further investigation is required in some catchments.

Following the BRAVA, problem characterisation and option development and appraisal stages, NWG have selected the 'best value' (rather than the 'least cost') approach for each catchment to achieve the key performance targets of the plan:

- achieve the expected SO targets;
- achieve NWG's Ambitious Goal of zero internal property sewer flooding by 2040; and
- ensure that all WwTWs are compliant with their DWF treated effluent consent values.

Taking each of these performance targets in turn, where measures are required to achieve the expected SO targets, below-ground storage has been identified as the best value option within 689 drainage communities. The hybrid approach of Surface Water Management (a combination of catchment management, blue/green corridors, SuDS and new surface water sewers) has been identified as the best value option in eight drainage communities.

Whilst these measures will also address some of the **internal property sewer flood risk** (e.g., 8,084 properties would benefit through these measures within AMP8, 2025-2030), further measures are required to achieve NWG's ambitious flood goals. This is due to below-ground storage typically being located at the SO asset as an 'end-of-pipe' type option, thus it does not provide flood risk reduction in the catchment. Where further measures are required, where feasible, the hybrid approach of Surface Water Management is also adopted, which reduces the volume of flood storage required, as well as providing wider environmental and social benefits. Some further below-ground storage in catchments is also promoted to address the internal property flood risk. With these additional measures a total of 11,527 properties are expected to benefit from reduced risk of internal sewer flooding within AMP8.

To accommodate population growth and development whilst managing changes in **DWF compliance**, measures are included in the plan to upgrade 26 WwTWs within AMP8, typically this will be through WwTW extensions.

The timeline for delivery of measures has been established based on the sensitivity of the catchment (in relation to SOs), the anticipated targets emerging from Defra's consultation on the SODRP (which itself is informed by the sensitivity of catchments), and NWG's Ambitious Goals for flood risk reduction.

In addition to the selected options for each drainage community, the DWMP includes overarching commitment to partnership working, such as with other flood risk authorities like the Environment Agency or local authorities. Further, NWG operate a number of 'business as usual' activities, tools, and procedures to help manage and optimise wastewater systems. These are:

- Trigger management process – as part of a total quality management culture, the trigger management process has improved compliance at WwTWs and the quality of the region's rivers.

- Dynamic risk index and visit effectiveness – a tool to understand real-time compliance across all NWG WwTWs, this is combined with asset health data to identify high-risk sites in real time, allowing action to be taken.
- Sewer network information and performance reporting – monitoring information is used to identify issue such as the cause of flooding, blockages, and storm overflows to investigate and respond to such issues.
- Service delivery strategies – integrate with other long-term strategies such as Water Resource Management Plans, Climate Change Adaptation Plan and River Basin Management Plans to identify how requirements will be met up to 25 years ahead.
- Tactical plans – focus on the delivery of our service delivery strategies, focusing on a 0–2-year planning window. For example, the sewer tactical plan includes interventions around:
    - Customer communication – focussed interventions to help reduce the risk of sewer blockages as a result of sewer misuse.
    - Enhanced Flooding other causes CCTV programme – increasing CCTV find and fix activities.
    - External operational plan – focusses on operational improvements to help reduce external sewer flooding.
    - High Risk Properties – focusses investigation on properties where there has been a history of blockages and flooding.
- Long term strategies.
- Smart networks – whilst there are Smart Network options identified in the draft DWMP, there is an ongoing process within NWG to build-upon current knowledge of existing networks and to identify locations where the introduction of smart networks could contribute to increasing the resilience of drainage and wastewater systems. This is being done through enhancing and calibrating models against available data and by innovative techniques such as digital twin workshops.

6.2 Reasons for Selecting the Preferred Approach in the Draft DWMP

SEA guidance[7] notes that it is important to 'outline the reasons the alternatives were selected' and 'provide conclusions on the reasons the rejected options are not being taken forward and the reasons for selecting the preferred approach in light of the alternatives'.

The inclusion/ omission of the options within the Draft DWMP is summarised in **Table 6.2.1** below, along with the headline reasons for these decisions. This table should be read in conjunction with **Tables 5.3.1 and 5.3.2** which set out further the advantages/ disadvantages of each individual option, and **Table 5.4.1** which differentiates between L2s.

Table 6.2.1 – Inclusion/omission of options within the Draft DWMP, and key reasons

Options	Option included/omitted from the Draft DWMP and key reasons
Management Options	
Influence customer behaviour	**Influencing customer behaviour is not included as a costed measure within the Draft DWMP, however it will continue to be taken forward by NWG** (business as usual), informed by the DWMP findings, to target measures to where issues have been identified.

[7] Office of the Deputy PM (2005) A Practical Guide to the Strategic Environmental Assessment Directive, available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/7657/practicalguidesea.pdf

Options	Option included/omitted from the Draft DWMP and key reasons
Smart networks	**Smart network measures are <u>not</u> included in the Draft DWMP however will be <u>considered further</u> for potential inclusion within the final DWMP.**
Working in partnership	**NWG are committed to continued partnership working, several pilot scale opportunities are <u>included</u> within the Draft DWMP, these opportunities will be developed further for the final DWMP**.
<u>Green Options</u>	
Catchment management	**Catchment management is <u>included</u> in the Draft DWMP as part of a hybrid approach to Surface Water Management.**
Blue/ green corridors	**Blue/ green corridors are <u>included</u> in the Draft DWMP as part of a hybrid approach to Surface Water Management.**
SuDS features	**SuDS features are <u>included</u> in the Draft DWMP as part of a hybrid approach to Surface Water Management.**
<u>Hybrid Green/ Grey Approach</u>	
Surface Water Management	**A hybrid approach of Surface Water Management (comprising catchment management, blue/ green corridors, SuDS features and short sections of new surface water sewers) is <u>included</u> in the Draft DWMP as standalone option in eight drainage communities (L4s). In addition, where feasible and subject to further investigation, it will be considered in combination with below ground storage as the plan progresses.** This hybrid approach slows the flow of water supporting groundwater recharge and water retention at appropriate locations within catchments (in addition to providing climate resilience and wider social and environmental benefits). The plan has selected this as the preferred approach to achieve the separation of surface water flows from the combined sewer. However, the uptake of this approach within the Draft DWMP is currently relatively limited because: • alone it often does not provide the level of benefit required to achieve spill frequency reductions at SOs, which is one of the key performance targets of the plan; • it can be far more expensive than below ground storage. On average, it has been found that this type of option can be in the region of 10 – 15 times more expensive. For example, in Alnwick Drainage Community 06, this hybrid approach is estimated to cost £19 million compared to £2 million for below ground storage; • is a less mature, more uncertain suite of options, providing less surety in the ability to meet the emerging SO targets; • typically needs to be applied across large areas of a catchment (e.g., 5ha) to achieve the relevant SO and flooding requirements; • it is required across large areas, making it harder to implement particularly within urban areas where it needs to be integrated within the wider land uses; • typically it can only be achieved through partnership working and a longer-term planning approach; and • partnership working takes several years longer to deliver than traditional grey solutions and thus results are unlikely to be able to be achieved at the scale necessary to meet the shorter-term SO targets.
<u>Traditional/ Grey Options</u>	
New surface water sewers	**New surface water sewers at a large scale across drainage communities are <u>not</u> included within the Draft DWMP.**

Options	Option included/omitted from the Draft DWMP and key reasons
	Removing surface water flows from the combined sewer through the provision of new surface water sewer systems on a large scale across drainage communities may lead to downstream flood risk from the rapid conveyance of water, is expensive, carbon intensive and may be difficult to locate. **Short sections of new surface water sewers are <u>included</u> in the Draft DWMP as part of a hybrid approach to Surface Water Management.**
Below-ground storage	**Below ground storage is <u>included</u> as a widespread option within the Draft DWMP, proposed in 689 drainage communities (L4s). Where feasible and subject to further investigation, it will be considered in combination with Surface Water Management as the plan progresses.** Large scale uptake of below ground storage is included within the Draft DWMP because: • it provides reliable flow reduction to meet the key performance targets of the plan; • it can be delivered by NWG at individual locations within a drainage community, enabling faster delivery to meet the emerging SO targets; • it allows SO at RNAGS sites to be abandoned to meet the emerging SO targets; and • it is the most cost-beneficial option.
Sewer upsizing	**Stand-alone sewer upsizing is <u>not</u> included within the Draft DWMP.** This option has been screened out based on technical feasibility.
Flow transfer	**Transfer of flows between catchments is <u>not</u> included within the Draft DWMP.** No suitable catchment transfers have been identified.
WwTW rationalisation	**WwTW rationalisation is <u>not</u> included within the Draft DWMP.** No WwTWs have been identified for rationalisation to meet the key performance targets of the plan. However, this could potentially be taken forward by NWG outside of the DWMP (such as for technology or efficiency reasons).
WwTW upgrade	**WwTW upgrades are <u>included</u> within the Draft DWMP.** WwTW upgrades at 26 WwTWs within AMP8 are included to accommodate population growth and development. Typically, this will be through WwTW extensions. Further WwTW upgrades may be required as a result of the reduced SO spills, resulting in an increased treatment volume. This is subject to further review for the final DWMP.
SO rationalisation	**SO rationalisation (where flows are diverted to another SO)[8] is <u>not</u> included within the Draft DWMP.** This has been screened out based on the SO discharge causing detriment elsewhere, which would not be in line with the SODRP consultation. **However, all spills from SOs at RNAGS sites will be reduced to zero, and the SO abandoned** as a result of other measures implemented through the DWMP (below-ground storage and surface Water Management). Through these same measures, **spills at other SOs will be reduced to meet the targets set out in Table 2.1.1.**

[8] This is the basis on which this option was assessed in **Tables 5.4.1** and **5.4.2**

In some cases, there may be potential to overcome some of the reasons for discounting options identified in the table above through further work. Suggestions for further work are set out in **Section 7.2** within the next chapter.

6.3 SEA Assessment of the Draft DWMP

This section assesses the overarching Draft DWMP as a whole (the earlier **Chapter 5** assessed the individual options available within the plan).

The DWMP aims to protect and enhance the environment, support resilient communities and economic growth. The key performance targets of the DWMP relate to environmental improvements to tackle SOs, and WwTW DWF discharge compliance, which are key issues in relation to water quality (and subsequently biodiversity and bathing water quality/human health). The most sensitive environments are prioritised for action first. The remaining key performance target seeks to address internal property sewer flooding providing strong socio-economic and human health benefits. As such the overall direction and purpose of the DWMP shows positive alignment with the SEA objectives.

Options within the DWMP have been selected to achieve:

Storm overflows -

- All SO occurrences where discharges are to a WFD watercourse with 'Water Industry – Intermittent Discharges' as a reason for the RNAGS eliminated by 2045
- All other inland SOs, including those that are located within the vicinity of a High Priority area, Sites of Special Scientific Interest (SSSI), Special Areas of Conservation (SAC) and eutrophic sensitive areas reduced to an average of ten annual spills by 2045
- All SOs linked to the ecological standards of designated bathing waters to be reduced to an average of no more than one annual spill by 2045
- These measures see 101 high priority SOs improved by 2030; with all 265 high priority SOs improved by 2045; and all 1,567 SOs improved by 2050.

Flood risk -

- 11,527 properties benefit from reduction of internal property sewer flood risk within AMP8 (2025-2030), increasing to a total of 33,598 properties by the end of AMP10 (2040)

WwTW DWF compliance -

- Maintenance of performance of WwTW DWF compliance through investment at 26 WwTWs

Tables 6.3.1 and **6.3.2** below draws together the total effects of the Draft DWMP in combination with the underlying trend, to establish the cumulative effect. The total effects and the cumulative effects of the plan can be defined as:

Draft DWMP (overall approach, options selected, outcome) = total plan effects

Total plan effects + 'likely future without the plan' = cumulative effects

The likely future without the plan includes the changes that are likely to happen in the background outside of the control of the plan, whilst the plan is being implemented. This is presented as part of the baseline review in **Appendix C**.

Table 6.3.1 – SEA Assessment Matrix of the Draft DWMP

Level 1 Study Area

	Protect, conserve, and enhance biodiversity & geodiversity, including soils	*Protect, conserve, and enhance Human Health and well-being, including resilient communities*	*Protect, conserve, and enhance social and economic prosperity*	*Address causes of climate change, manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation*	*Protect, conserve, and enhance water resources*	*Reduce and manage flood risk, increasing flood resilience*	*Protect, conserve, and enhance the historic environment, including archaeology*	*Conserve, protect and enhance the landscape, townscape, and visual amenity*	*Adapt, and improve resilience to climate change*
	Biodiversity	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
Overall DWMP: during construction	-	0	+	- -	-		-	0	
Overall DWMP: during operation	++	+	+	- -	+++	+++	+	+	+

Table 6.3.2 – SEA Assessment Narrative of the Draft DWMP

SEA Objective	Total plan effects	Cumulative effects
Biodiversity & Geodiversity	The plan prioritises measures where SOs are impacting the identified RNAGS (in relation to ecological status) within watercourses, and other high priority inland SOs (such as SSSIs). This will provide a significant positive permanent benefit for aquatic biodiversity. As the implementation of the plan progresses, the benefits of the plan will extend across the plan area. WwTW upgrades to cope with additional demand from population growth will prevent damage to aquatic biodiversity from that population increase. The construction of below ground storage, sections of new surface water sewers and WwTW upgrades will result in localised temporary loss of biodiversity during construction. The significance of the effect will depend on the current land use and ecological value (e.g., ranging from no value within a highway, to high value within a designated site). Careful siting, planning and construction will be required to avoid and minimise impacts. Potential exists for biodiversity net gain within reinstatement (again, this will be location specific). The Surface Water Management approach offers the potential for long term positive effects on terrestrial biodiversity and geodiversity. Within rural areas, catchment management provides an opportunity to slow the rate of drainage, including of important habitats, contributing to rewilding and supporting natural hydrogeological processes. Within more urban areas, blue/green corridors and SuDS provide opportunities to provide/enhance biodiversity. The level of benefit achieved will depend on the extent of implementation of these green options, and their design.	Climate change will impact wildlife in the future by various means including, but not limited to, drought, timing of seasonal activities, higher frequency of storms, native species redistribution, invasive non-native species, and increased potential for wildfire. Changing climate could impact on the quality of soils across the region through temperature extremes and changing rainfall patterns. Development pressure is likely to increase the risk of habitat loss and fragmentation, particularly outside of the extensive designated areas. Through partnership working, measures such as blue/green infrastructure offer the potential to increase resilience to climate change by allowing the movement of species through the environment and supporting natural soil processes. Reduced spills from SOs and WwTW upgrades will support biodiversity, reducing susceptibility to the above threats.
Human Health	Human health is particularly important in this region where the health of residents is lower than the average for England, life expectancy	The population of the UK is ageing, putting additional pressures on public finances and services.

SEA Objective	Total plan effects	Cumulative effects
	ranges from 6.6 to 15.26 years lower than the average for England and childhood obesity rates are up to 26.9%. The plan will eliminate internal property flood risk to over 11,000 properties by 2030 and to all 27,788 properties by 2040, providing immediate permanent human health benefits in relation to health (exposure to sewage) and well-being (stress, anxiety). SOs discharging to designated bathing waters will be reduced by 2035, providing a permanent positive effect on human health. These measures may increase the uptake of open water swimming, providing further health and well-being benefits. Surface Water Management measures provide an opportunity to provide access to green spaces with improved connectivity through them, providing a permanent positive effect on human health. The level of benefit achieved will depend on the extent of implementation of these green options, and their design. Potential exists to provide public access above below-ground storage assets, such as play areas, gyms, etc (this will be location specific).	Policy is placing increasing emphasis on access to green space, green infrastructure, and improved accessibility to sustainable modes of transport. Surface Water Management measures provide an opportunity to support these measures, improving health and well-being.
Socio-economic	The plan area experiences higher than average levels of unemployment, with a large number of neighbourhoods being the most deprived nationally. This can result in communities being more susceptible to the effects of flooding (e.g., residents are less likely to have home insurance or available funds for clean-up and replacement of goods). As such reduced flood risk provides a positive, permanent, long-term effect to a more sensitive population. Given the scale of work that will need to be implemented through the plan, there is likely to be a socio-economic boost such as employment opportunities through the construction phase. Whilst	In both the short and longer term, there is uncertainty in relation to socio-economics across the country. Whilst the plan is unlikely to substantially affect this, the flood risk reduction and water quality improvement measures will reduce risks and support a good economic and social environment.

SEA Objective	Total plan effects	Cumulative effects
	this will be temporary, it is expected to continue in the long-term until 2045. The multi-functional nature of blue/green corridors can provide active travel routes (such as footpaths and cycle paths), increasing low-cost transport options on a permanent basis.	
Carbon & Material Assets	Given the scale of below ground storage to be implemented through the plan, there is expected to be a moderate adverse effect on carbon and material assets through the construction of below ground concrete storage, and the subsequent on-going increased wastewater treatment requirements. Following feedback as part of the SEA process, the volume of storage has been reduced through increased use of Surface Water Management in certain drainage communities where it has been shown to be able to provide the appropriate level of surety of achieving the outcomes required. Surface Water Management measures are typically not resource intensive to construct, operate, or maintain, providing nature-based solutions. There may be opportunities for increasing the uptake of this hybrid approach through the implementation of the plan, thus reducing the significance of the impact. The use of both selected options is likely to increase pressure on land use. Below ground storage and WwTW upgrades require relatively small areas of land on a permanent basis. Surface Water Management must be applied over much larger areas, however, it can be integrated with other land uses.	The future trend is towards reducing carbon emissions and increased resource efficiency. The below ground storage approach does not necessarily support. However, the majority of the negative impact is likely to be during the construction phase rather than operation (depending on the amount of pumping and additional treatment that may be required.
Water Resources	The DWMP will result in major positive permanent effects on water quality through reduction in spills from SOs and WwTW improvements to accommodate population growth and the changing	Climate change and growth are anticipated to increase stress on the water environment, such as through changing rainfall patterns, extreme weather events and increased demand for water and associated wastewater treatment requirements. The DWMP has

SEA Objective	Total plan effects	Cumulative effects
	climate. This will have secondary benefits for biodiversity, human health and socio-economics. There is potential for short-term, localised, temporary pollution of watercourses through construction works in close proximity to watercourses. However, in line with legal requirements and best practice, these are anticipated to be prevented through good construction practices.	accounted for these pressures and is designed to address them to help address this issue.
Flood Risk	The DWMP will result in major positive permanent effects by reducing internal sewer flood risk. Further positive permanent effects may also be achieved in terms of reduced surface water flood risk where surface water management is improved to reduce the risk of sewer flooding.	Flood risk is anticipated to increase as climate change progresses as a result of changing rainfall volumes and intensity. The DWMP has accounted for the anticipated changes whilst reducing the risk of sewer flooding to help address this issue.
Heritage	At the plan level, there are no anticipated significant effects on heritage assets, although sewer flood risk reduction measures are likely to reduce the sewer flood risk to some heritage assets, such as Listed Buildings, providing a minor positive permanent effect. Construction works, particularly those that involve ground works are likely to have a minor negative effect on heritage assets, particularly archaeology. However, this will be location specific, with potential for significant adverse effects at the project level which will require further controls (see **Table 7.1.1** below).	Historic assets may be at greater risk from the direct impacts of future climate change, through flooding, sea level change, storms, and other factors; the DWMP will help to address those risks associated with sewer flooding.
Landscape	Below ground storage, once restored post construction, is not anticipated to have a landscape impact. Where Surface Water Management measures are planned within urban areas, there is potential for a positive benefit in terms of townscape (design dependant); where planned within rural areas there is potential for positive landscape impact (dependant on design reflecting the local landscape charter). Given the proposed	Climate change has the potential to impact high value landscapes through changing patterns of rainfall or sea level rise; population growth also has the potential to erode landscape quality. Surface Water Management measures may help address these issues where it is implemented.

SEA Objective	Total plan effects	Cumulative effects
	scale of implementation of this option, it is noted as a minor positive permanent impact.	
Climate Change Resilience	Overall, the DWMP will have a minor positive permanent effect in supporting resilience to climate change. Below ground storage will provide wastewater storage for later treatment and release. Surface Water Management will increase climate change resilience by slowing the flow of water, promoting natural flood risk reduction, supporting biodiversity in terms of habitats and their connectivity and in urban areas helping to counter the urban heat island effect. The magnitude of the positive effect of the plan could be increased by increased adoption of this option.	The plan will support the wider move to increase resilience to climate change.

7 PREVENT, REDUCE, MITIGATE, ENHANCE EFFECTS

The SEA Regulations require the environmental report to include:

> *'The measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effect on the environment of implementing the plan or programme' (SEA Regulations, Schedule 2 (7))*

7.1 Measures to Prevent, Reduce, & Mitigate Adverse, & Enhance Beneficial Effects

This section outlines the key changes made to the plan to prevent, reduce, mitigate, and compensate for adverse effects on the environment, and to maximise beneficial effects.

These should be noted within the wider context of the plan – the purpose of the plan is for NWG in partnership with others, to ensure the sustainability of drainage infrastructure, and the services it provides to customers and the environment to support economic growth and resilient communities, and to protect and enhance the environment.

Measures have been suggested throughout the SEA process and plan development, leading to the following changes to the plan:

- Reduced reliance on the below ground storage option, in favour of an increased uptake of the hybrid Surface Water Management approach. This has increased cost by £273m (before accounting for additional wastewater treatment costs).
- Amendments and clarifications to the options considered when developing the plan, and their hierarchy.

As the plan is taken forward, further measures will be required to prevent, reduce, mitigate, and compensate adverse effects and maximise the beneficial effects of the plan. These are set out in **Table 7.1.1** below.

Table 7.1.1 – Measures to prevent, reduce, mitigate and compensate effects

Options	Measures to prevent, reduce, mitigate, compensate
Catchment management	Consider catchment management on a case-by-case basis considering the impact of drainage changes on habitats and land uses, including: • the social and economic implications, such as to farming practices • habitat impacts (both positive and negative), particularly for the most important habitats within Special Protection Areas, SACs, Ramsar sites and SSSIs (refer to the DWMP HRA Screening along with other published information) • landscape impact (refer to the locally prepared Landscape Character Assessments for local landscape features, quality, forces for change and strategy) Whilst increased long-term climate resilience may offer habitat and socio-economic benefits in the longer-term, careful consideration is required of the impact of changes made.

Blue/ green corridors	Along with water management, blue/green corridors should be designed to achieve multi-functional benefits, including active travel routes (footpaths, cycle paths), recreation, biodiversity, landscape/ townscape, and reducing the urban heat island effect. To achieve this, the design will need to take account of more localised issues such as biodiversity value, local connectivity, and locally prepared Landscape Character Assessments. Blue/ green corridors should be designed and implemented following SuDS guidance, including in relation to pollution control and discharge to watercourses and groundwater. Early and effective partnership working is required.
SuDS features	Along with water management, SuDS features should be designed to achieve multi-functional benefits, including biodiversity, landscape/ townscape, and reducing the urban heat island effect. SuDS features should be designed and implemented following SuDS guidance, including in relation to pollution control and discharge to watercourses and groundwater.
New surface water sewers	Reduce the extent of new surface water sewers through use as part of a hybrid solution (such as SuDS features, modification of upstream watercourses, rain gardens etc). Such an approach would provide the opportunity for wider enhancements, such as for biodiversity. Design new surface water sewers in a manner which slows the flow of water to the receiving environment. Where water quality allows and where feasible, promote discharge to surface waters in preference to sewer. For larger schemes, undertake flood risk modelling of the proposed discharge of surface water flows to determine level of flood risk. Should fluvial flood risk reduction measures be required, they should be costed into this option and their associated environmental effects considered. Further catchment specific assessments are required to identify the most appropriate routing, design and construction methods for the new sewer route and outfall. Cost and programme allowance should include for this, including issues such as ecology, heritage, consenting (e.g., discharge consents[9]) and traffic management. The nature of constraints/impacts will vary on a catchment-by-catchment basis. For example, a number of the catchments have high historic value and will require greater specialist heritage input; particular care is required within areas of high biodiversity value, in particular for certain ecological designations where, as a minimum, HRA screening will be required Reducing the extent of new surface water sewers through use as part of a hybrid solution provides the greatest opportunity to minimise resource use. Some further reduction in resource use is likely to be able to be achieved within construction through design optimisation, such as materials selection.
Below-ground storage	Limited reduction in resource use during construction and operation may be able to be achieved through design optimisation, such as materials and plant selection. Further catchment specific assessments are required to identify the most appropriate siting, design, and construction methods for below ground storage. Cost and programme allowance should include for this, including issues such as ecology

[9] Given the proposed short sections of new sewers, EIA screening is considered to be unlikely to be required.

	and heritage. The nature of constraints/impacts will vary on a catchment-by-catchment basis. For example, a number of the catchments have high historic value and will require greater specialist heritage input; particular care is required within or in proximity to certain ecological designations where, as a minimum, HRA screening will be required. Given storage will typically be an end-of-pipe solution, the new infrastructure will typically be sited near to watercourses. Careful consideration of pollution control will be required during construction. Consenting requirements should be reviewed, such as a Flood Risk Activity Permit for works close to watercourses. Siting of storage should also consider efficient use of land (such as optimising reuse of previously developed land). Given the sterilisation of land from further development, development policies and context (as established through Local Development Plans) should also be considered. Opportunities should be sought to provide wider benefits for the land during post construction reinstatement, in keeping with the landscape/townscape/seascape setting. This may include habitats, recreational access, and/or amenity value. Given the scale at which this option is being taken forward, consideration should be given to capturing these issues through design codes, or similar.
WwTW upgrade	The nature and extent of WwTW upgrades is currently unknown and as such measures to prevent, reduce, mitigate and compensate effects can only be considered at the strategic level at this stage. Consideration should be given to: • The nature of the site and any sensitive receptors (e.g., terrestrial and aquatic biodiversity, heritage, archaeology, landscape, local land uses sensitive to odour and noise) and the local published information for these topics (e.g., Landscape Character Assessments, Biodiversity Action Plans, Local Development Plans) • Effluent discharge requirements • Changes to the fluvial flood risk as a result of increased discharges • Seeking opportunities to reduce resource use during construction, increase efficiency in operation, increase effectiveness of treatment

7.2 Recommended Further Work to Enhance the Plan

Following consultation, the Draft DWMP will be developed into the final plan which will be implemented from 2025-2030. This will inform the subsequent DWMP to be implemented from 2030. It is recommended that consideration is given to the following further work to enhance the plan as it develops and is implemented:

- Consideration should be given to including within the cost benefit analysis the carbon 'costs' (embodied and operational) of the plan, and the CAPEX costs associated with the additional wastewater treatment requirements from use of the storage option.
- The modelled costs, benefits and hydraulic performance of the Surface Water Management approach should be kept under review and refined as appropriate as experience of such measures grows. It may be appropriate to undertake pilot schemes in partnership with others (including universities/researchers) to inform the development and implementation of this approach within AMP8; and its assessment within subsequent DWMPs.
- As experience and knowledge of the performance of the Surface Water Management approach grows, its adoption within AMP8 should be increased where feasible within

drainage communities as part of the solution (thus reducing the storage volume and subsequent water treatment as well as providing wider benefits).

- NWG and wider partners should continue joint working with momentum, which is essential to implement the Surface Water Management approach which can achieve wider social and environmental benefits beyond those directly associated with overflows, flood risk and WwTW compliance.
- Information developed through the plan making stage should be shared where this may assist and influence other stakeholders (e.g., planning authorities, developers, LLFA). For example, the plan has developed new data to identify the area of impermeable runoff that would need to be removed from the combined sewer network to achieve the ambitious target of zero internal flooding. This could influence wider stakeholders who could work to help achieve this.
- Within subsequent DWMP cycles, consideration should be given to the potential to include consideration of catchment level nutrient management.

8 MONITORING THE SIGNIFICANT EFFECTS OF THE PLAN

The SEA Regulations require the environmental report to include:

> *"A description of the measures envisaged concerning monitoring in accordance with regulation 17".*
>
> *SEA Regulations, Schedule 2 (9)*

A final stage of the SEA process is Stage E - Monitoring the significant effects of the implementation of the plan with the purpose of identifying unforeseen adverse effects at an early stage and being able to undertake appropriate remedial action. In line with the SEA Regulations, monitoring is only required for significant environmental effects and may comprise or include monitoring undertaken for other purposes.

8.1 Proposed Monitoring

At this stage, it is only necessary (and appropriate) to set out the measures envisaged concerning monitoring. **Table 8.1.1** below provides a summary of the proposed monitoring parameters for the implementation of the preferred plan across the plan area and the plan period. This is based on the current understanding of the DWMP context within the region at present, with consideration of future baseline trends. These proposals will be kept under review and developed further as the DWMP progresses and in consultation with the statutory consultees, and other applicable stakeholders. This may include expansion of the proposals to agree the appropriate scale and duration of any monitoring activities proportional to the plan and the environmental risks; and further development to link the monitoring to NWG's targets and Environmental Performance Assessment (EPA) rating.

On an option specific scale, further monitoring requirements may arise, such as any requirements set out within any planning permissions.

Given the current scale of monitoring around the key topic areas, it is proposed that full use is made of existing monitoring arrangements, many of which are regulatory requirements. These are undertaken both by NWG and other organisations such as the Environment Agency (e.g., water quality) and Natural England (e.g., SSSI condition status).

Table 8.1.1 – Proposed Monitoring Parameters

SEA Topic	Proposed Monitoring Parameters (organisation undertaking monitoring or holding the data)
Biodiversity & Geodiversity	• SSSI condition status (Natural England) • RNAGS (Environment Agency)
Human Health	• (To be considered indirectly through other monitoring such as flood risk and water resources) • Customer Satisfaction (NWG)
Socio-economic	• (To be considered indirectly through other monitoring such as flood risk and water resources)

Carbon & Material Assets and Climate Change Resilience	• Carbon emissions (NWG)
Water Resources	• Pollution incidents per 10,000km of sewer (NWG) • Total wastewater pollution incidents (NWG) • Total water pollution incidents (NWG) • Number of treatment works permit failures (NWG) • Number of bathing waters achieving 'good' or 'excellent' classification (Environment Agency) • Changes to WFD waterbodies (Environment Agency)
Flood Risk	• Changes to flood risk at the location and elsewhere (NWG, LLFA, Environment Agency)
Heritage	• (Scheme specific requirements to be developed as appropriate)
Landscape	• (Scheme specific requirements to be developed as appropriate)

Assessment of monitoring results and any remedial action required should be undertaken by NWG through the DWMP implementation and collated for use within the SEA for subsequent DWMP development, especially future DWMP cycles.

9 OTHER ASSESSMENTS

9.1 Habitat Regulations Assessment

An HRA screening assessment has been undertaken to check if proposals within the plan are likely to have a significant effect on the conservation objectives of sites within the national site network (previously known as 'European Sites'), i.e., Special Protection Areas and Special Areas of Conservation. The screening has identified the relevant sites within and adjacent to (within 5km) of the study area, their qualifying features, and the potential negative and positive impacts on the sites.

Through a review of the draft DWMP in relation to these sites, it has been possible to screen out some catchments from further consideration due to distance and a lack of hydrological connectivity resulting in no likely significant effect to the national site network. At this stage, given the strategic nature of the plan and the proposed measures (which are currently not location or scheme specific), it has not been possible to screen out the remaining catchments/measures, as such further HRA screening will be required as the plan develops. In general, given the location of the national site network and the drainage communities being considered, these areas are typically within the coastal area.

There is potential for the DWMP to result in positive impacts to the national site network (such as through improved water quality), as well as negative impacts (such as through construction works).

9.2 Invasive Non-Native Species (INNS) Risk Assessment

The SEA framework has considered the risks posed by INNS at a strategic level under the Biodiversity SEA Objective. At the strategic level, the SEA has not identified any high-risk activities such as water transfers within the Draft DWMP, however more detailed INNS assessment may be required if substantial changes are made to the final DWMP or post implementation if any options involve water transfers or other high-risk activities. INNS assessment determines the risk posed by INNS based on the species present, the relevant pathways and the receptors that could be impacted. Further site-specific assessment will be required during implementation of the plan where INNS are present or pose a risk.

9.3 Water Framework Directive (WFD) Assessment

WFD assessment considers impacts of activities on WFD waterbodies, including the quality of water within rivers, their physical habitat and ecology. The purpose is to determine whether or not activities support the objectives of the relevant River Basin Management Plan. As the DWMP is a strategic level plan, rather than a specific activity, WFD Assessment has not been undertaken during development of the plan.

WFD Assessments could be required during implementation of the plan in relation to specific schemes that emerge from it where for example:

- a flood risk activity permit is required for certain activities on an Environment Agency Main River; or
- the activity could affect a water body that is at high status.

Further review of the need for WFD Assessments should be undertaken as the plan is implemented.

9.4 Biodiversity Net Gain Assessment

At this strategic level, awareness of the requirement to achieve biodiversity net gain for development projects has been considered through the SEA framework to influence options selection (including aiming to prevent the selection of options involving significant biodiversity loss). More detailed consideration of the achievement of biodiversity net gain is required during the implementation of the plan. Whilst the statutory requirements of the Environment Act will only apply to projects requiring planning permission, the NERC Act duty to 'enhance' biodiversity also applies.

10 NEXT STEPS

10.1 Consultation and Developing the Final DWMP

This SEA Environmental Report is issued for consultation along with the Draft DWMP, for 12 weeks until 23rd September, including with the SEA consultation bodies.

The Draft DWMP and associated documents including the SEA, are available to view and download free of charge from www.nwl.co.uk/dwmp. Responses should be provided via this weblink by **23rd September 2022**.

Consultee comments will subsequently be reviewed and considered within the development of the final DWMP, Environmental Report and HRA. These are due to be published on 31 March 2023.

APPENDIX A: CONSULTATION RESPONSES

Appendix A Consultation Responses

Consultee Responses

The SEA Scoping Report was issued to statutory consultees and selected partners, on 17 January 2022 for a five-week period. Comments received have been collated in this Appendix/ the table below.

Comments Received	Northumbrian Water Response
Environmental Agency	
No comments	N/A
Natural England	
No comments	N/A
Historic England	
No comments	N/A
Non-Statutory Consultee – Northumberland County Council	
"The SEA Scoping Document seems comprehensive. It is particularly pleasing that the range of SEA objectives takes in areas of concern to the Council, in terms of health and wellbeing, heritage, biodiversity and the landscape."	Thank you, these have been carried forward through the SEA Environmental Report.
"On landscape, we note that the documentation listed in Appendix A does not include locally prepared Landscape Character Assessments, which would, we feel, aid the understanding of the key qualities of valued landscapes that could be significantly affected by aspects of the DWMP's programmes."	Thank you, LCAs have been added to the policy review appendix. They have been reviewed and key issues relating to drainage have been identified within the baseline environment appendix. To prompt these to be considered further as the DWMP progresses to the implementation stage, reference has been to the LCAs within the measures to prevent, reduce, mitigate, and compensate any landscape effects.
"We note that the health and well-being objective includes resilient communities, which is important in relation to the almost existential threat that past flooding events have posed to the central hubs of some of the County's key town and village communities."	Noted, and yes, we recognise the importance of the key targets the DWMP sets out to achieve could play both now and in the future.
Non-Statutory Consultee – Durham County Council	
Pg 11 - Table 3.1.1: Flood risk comments. *Reduce* flood risk (not decrease); *simplify to say manage all flood risk*; change "resilience to flood risk" to "*resilience to flooding*"; insert *water quality* to last line.	Thanks, the first three points are agreed. The last point is covered within the Water Resources SEA Topic and separate to our Flood Risk SEA Topic.
Pg 13 - Section 4.2.1: Clarification of HRA regs and impact pathways. *2017 Regs not the latest.* *Update terminology like Natura 2000 (National Site Network) to reflect latest legislation.* *SPA (2010) should be updated.* *Not clear what impact pathways were used and therefore what sites outside the Level 1 boundary were scoped in/out.*	Thank you, text has been checked and developed further within the HRA Screening report. The 2017 regulations remain the key legislation, although they have been updated and as such are noted to be 'as amended'. Clarity added to the report regarding the national site network. For the purpose of scoping only those designations that intersected the Level 1 Study Area were listed ahead of future work on the HRA. The subsequent HRA Screening Report has considered such sites beyond the boundary of the Level 1 study area – this report details how they were scoped in/out based on the impact pathways. The HRA Screening considers both hydrological and non-hydrological influences outside the Study Area.
Pg 29 - Section 4.2.9: Whilst 'defined' not designated there is no reference made to the Durham Heritage Coast or the associated Management Plan. The DHC stretches from Sunderland to Hartlepool and is given protection	Thanks for bringing this plan to our attention, we have reviewed and added it to the baseline environment and opportunities section of the SEA report.

Appendix A Consultation Responses

through the NPPF and CDP. https://durhamheritagecoast.org/about_us/the-vision/ There is also no reference to locally defined Areas of Higher Landscape Value.	Given the strategic nature of the DWMP, at this stage, locally defined landscapes have not been reviewed. This is consistent with the approach taken within other SEA topic areas.
Pg 37/38 – Table 5.2.1: Issues and Options Summary Table (water resources & flood risk). "Avoid and control contamination" – *can you control?* "Early integration of climate change resilience measures…" – *Is this written as an opportunity or as a statement?* "Reduce flood risk and associated impacts at NWG sites, customer homes, and elsewhere" – *Similar comment to Page 11 – too wordy.* "Increase infrastructure resilience to flooding including climate change impacts" – *just infrastructure or community and economic*? Change "intensified" to *increased.* "Encourage soft engineering techniques to sustainably manage wastewater" – *It is not clear if the intention is to encourage NW or developers. Does this point actually relate to surface water rather than waste water or should it be both?*	Thanks, wording of these have been clarified in line with your comments set out.
Pg 50 – HRA scoping and in combination effects. *Should Identify positive and negative impacts.* "risk having a significant effect on a European site on their own or in combination with other projects or plans" - *Needs to be clear how we are taking account of neighbouring authority plans.*	Comments passed to the authors of the HRA screening.
In relation to the HRA elements the following link takes you to the County Durham Plan evidence page. https://durhamcc-consult.objective.co.uk/kse/folder/52317 Document C16 is the HRA for the Plan and should be helpful in identifying in combination impacts. Document I2 is the council's HRA Developer Guidance which should help with the scoping and screening elements of the HRA. We would also welcome consultation at the next stage of the HRA process.	Thanks, we are sure this will be useful and have passed this onto our colleagues who are undertaking the initial HRA screening.
Appendix A (Policies and Plans) – *should include the DCC Flood Risk Management Strategy, Strategic Flood Risk Assessment and Water Cycle Study. The LDP and GIP include relevant evidence bases like SFRA and WCS.*	Thanks, these have been added in our policy, plans and objective section.
Non-Statutory Consultee – Member of SPG	
Suggest splitting the SEA category for Climate Change into Cause and Resilience as options may assess differently for the two issues.	Noted and agreed. Following a review of the SEA Objectives, the 'Material Assets' objective has been clarified/expanded to cover 'Carbon & Material Assets'; and the 'Climate Change' objective amended to 'Climate Change Resilience'.

APPENDIX B: REVIEW OF RELEVANT PLANS, PROGRAMMES AND ENVIRONMENTAL PROTECTION OBJECTIVES

Appendix B – Review of Relevant Plans, Programmes and Environmental Protection Objectives

Policy or Plan	Summary of Guidance
International	
Biodiversity	
Bern Convention - Conservation of European Wildlife and Natural Habitats (1979)	Aims to conserve wild flora and fauna and natural habitats. Importance is placed on the need to protect endangered natural habitats and endangered vulnerable species.
Bonn Convention - Conservation of Migratory Species of Wild Animals (1983)	Aims to conserve terrestrial, aquatic, and avian migratory species through their range noting that species do not recognise borders.
Ramsar Convention - Wetlands of International Importance (1971)	Aims to conserve and wisely utilise wetlands through local and national actions to international cooperation. The Convention uses a broad definition for wetland: "lakes and rivers, swamps and marshes, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, and human-made sites such as fishponds, rice paddies, reservoirs, and salt pans".
United Nations (1992) Convention on Biological Diversity (1992)	The main objectives are conservation of biological diversity; sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources.
Climate Change	
UN Framework Convention on Climate Change (1992)	The stated objective is to: "achieve stabilisation of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system".
UN Framework Convention on Climate Change/ Cancun Agreement (2011) Kyoto Protocol (1997)	The Cancun Agreements were a set of significant decisions by the international community to address the long-term challenge of climate change collectively and comprehensively over time, and to take concrete action immediately to speed up the global response to it. Kyoto commits its parties to limit climate change by setting internationally binding targets for emission reductions. It was adopted in 1997 and ratified in 2005.
World Summit on Sustainable Development (2002)	It commits nations to take a collective responsibility to build a human, equitable, and caring global society. The Declaration also reinforces the three pillars of sustainable development: environmental, economic, and social development at various levels.
The UNFCCC (United Nations Framework Convention on Climate Change) Glasgow/ COP26 Agreement (2021) Paris Agreement/ COP 21 (2015)	Mitigating and adapting to climate change is a critical policy consideration at an international level with multiple agreements in place to address the climate emergency. The UNFCCC is the forum for international action on climate change with the aim of stabilising GhG concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. The UNFCCC focuses on mitigating (reducing) GhG emissions, adapting to climate change, reporting of national emissions, and financing of climate action in developing countries. Agreed at COP 21, the Paris Agreement commits signatories to reducing global greenhouse gas emissions with the long-term goal of withholding a temperature increase by no more than 2°C. The recent COP26 gathering in Glasgow led to the Glasgow Climate Pact, reaffirming the Paris Agreement goal of limiting the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5 °C. The pact recognises that GHG emissions need to fall by 45% by 2030 if the world is to stay on track to reach net zero by 2050 and requests countries revisit their 2030 targets by the end of 2022. In addition, the Cancun Adaptation Framework recognises that adaptation is required to be given the same priority as mitigation including reducing vulnerability and increasing resilience. Any major transport infrastructure development set out in the emerging RTS should contribute to meeting the requirements and targets set out in international climate change policies and agreements.
Heritage	
Charter for the Protection and Management of Archaeological Heritage (1990)	The Charter states that policies for the protection of archaeological heritage should constitute an integral component of policies relating to land use, development, and planning as well as of cultural, environmental, and educational policies. The charter should be supplemented at regional and national levels by guidelines for need.

The World Heritage Convention (1972)	The Convention defines what type of natural or cultural sites can be considered for the World Heritage List. It sets out the duties of countries in identifying potential sites and preserving them for the benefit of the world.
Overarching	
Aarhus Convention (1998)	The Aarhus Convention was created to give empowerment to citizens and civil society organisations in relation to environmental matters and is founded on the principles of participative democracy. It provides for access to environmental information; public participation in environmental decision making; and access to justice.
UN Agenda 2030	The Sustainable Development Goals (SDGs) are a collection of 17 interlinked global goals designed to be a "blueprint to achieve a better and more sustainable future for all". The SDGs were set up in 2015 by the UN General Assembly and are intended to be achieved by the year 2030. They are included in a UN Resolution called Agenda 2030. The SDGs were developed in the Post-2015 Development Agenda as the future global development framework to succeed the Millennium Development Goals which ended in 2015.
European	
Biodiversity	
Council Regulation No. 1100/2007: Establishing measures for the recovery of the stock of European eel (2007)	This EU Regulation was transposed into UK law under The Eels (England and Wales) Regulations 2009. Eleven Eel Management Plans have been prepared, one for each River Basin identified in England and Wales.
The Habitats Directive; also known as the Directive for the Conservation of Natural Habitats and of Wild Flora and Fauna (92/43/EEC) (1992)	The Habitats Directive promotes the maintenance of biodiversity. While the Directive contributes to sustainable development; it focusses to ensure the conservation of around 450 species of fauna and 500 species of flora. The Habitats Directive also establishes the EU wide Natura 2000 ecological network of protected areas, providing a high level of safeguards against potentially negative developments. Together with the Birds Directive, the Habitats Directive forms the backbone of European nature protection legislation.
Birds Directive (2009/147/EC) (2009) (79/409/EEC - as amended) (1979)	This Directive adds to the Habitats Directive and provides a framework for the conservation and management of, and human interactions with, wild birds in Europe.
EU Biodiversity Strategy for 2030 (2020)	The strategy aims to put Europe's biodiversity on a path to recovery by 2030 and contains specific actions and commitments. It is the proposal for the EU's contribution to the upcoming international negotiations on the global post-2020 biodiversity framework. A core part of the European Green Deal, it will also support a green recovery following the Covid-19 pandemic.
Climate Change	
Promotion of the use of energy and renewable sources Directive (2009/28/EC) (2009)	Directive 2009/28/EC on the promotion of the use of energy from renewable sources set binding targets for the share of renewable energy sources in the final energy consumption for each EU country.
Air Quality	
Ambient Air Quality Directive (2008/50/EC) (2008)	Sets limits for key pollutants in the air we breathe outdoors. These legally binding limit values are for concentrations of major air pollutants that impact public health.
Heritage	
The Convention for the Protection of the Architectural Heritage of Europe (Granada Convention) (1985) Revised European Convention on the Protection of Archaeological Heritage (Valletta Convention/ Malta Treaty) (1992)	The Valletta Convention is an international legally binding treaty within Europe. It places the revised Convention in the framework of activities concerning the cultural heritage since the European Cultural Convention came into force. It deals with the protection, preservation, and scientific research of archaeological heritage. In particular, the revised Convention focuses on the problem of conservation of archaeological heritage in the face of development projects.
Landscape	
The European Landscape Convention (Florence Convention) (2004)	Aims to promote the protection, management and planning of all European landscapes and organises co-operation on landscape issues and raises awareness

	of living landscapes. The UK Government signed the European Landscape Convention becoming binding from March 2007.
Resource Use	
Soil Thematic Strategy (2006)	The Strategy aims to protect soil and promote sustainable use. It aims to prevent further soil degradation and restore degraded soils to a level of functionality consistent at least with current and intended use.
Water Resources	
The Nitrates Directive (91/676/EEC) (1991)	It aims to protect water quality by preventing nitrates from agricultural sources polluting ground and surface waters. Also, to promote the use of good farming practices. This Directive forms integral part of the WFD and is one of the key instruments to protect waters from agricultural pressures.
Directive on Bathing Water (2006/7/EC)	The overall objective of the Directive remains the protection of public health whilst bathing. The revised Directive also offers an opportunity to improve management practices at bathing waters; to standardise the information provided to bathers; aims to set more stringent water quality standards; and also puts a stronger emphasis on beach management.
Groundwater Directive (2006/118/EC) (2006)	This directive establishes a regime which sets underground water quality standards and introduces measures to prevent or limit inputs of pollutants into groundwater, including assessments on chemical status and the reversal of significant pollutant concentrations. The directive accompanies the WFD which requires pollution trend studies to be carried out and for trends to be reversed so that environmental objectives are achieved by 2015. It also requires reviews of technical provisions to be carried out from 2013 and every six years after.
The Water Framework Directive (WFD) (2000/60/EC) (2000)	The WFD introduces a planning process to manage, protect and improve the water environment. It applies to all rivers (including drains and ditches), lakes, estuaries, coastal waters, and groundwater. All surface waters (including rivers, lakes, estuaries and stretches of coastal water) and groundwaters have been divided up into discrete units called water bodies. Water bodies are the basic unit that are used to assess the quality of the water environment and to establish targets for environmental improvement.
The Floods Directive (2007/60/EC) (2007)	This Directive provides an approach to managing flood risk on a catchment-wide scale. It is used in conjunction with the WFD.
Urban Wastewater Treatment Directive (91/271/EEC) (1991)	The objective of this Directive is to protect the environment from the adverse effects of urban wastewater discharges and discharges from certain industrial sectors, and concerns the collection, treatment, and discharge of wastewater.
Revised Drinking Water Directive (2020/2184) (2020) Drinking Water Directive (98/83/EC) (1998)	In 2020, the European Parliament formally adopted the revised Drinking Water Directive. The Directive will enter in force on 12 January 2021, and Member States will have two years to transpose it into national legislation. The Drinking Water Directive (Council Directive 98/83/EC) concerns the quality of water intended for human consumption. Its objective is to protect human health from adverse effects of any contamination of water intended for human consumption by ensuring that it is wholesome and clean.
Marine Strategy Framework Directive (2008/56/EEC) (2008)	The aim is to protect the marine environment across Europe. It aims to achieve good Environmental Status of EU marine waters by 2020 and to protect the resource base upon which marine-related economic and social activities depend.
Directive on the Assessment and Management of Flood Risks (2007/60/EC)	This Directive now requires an assessment of all watercourses and coastlines at risk from flooding, to map the flood extent and assets and humans at risk in these areas and to take adequate and coordinated measures to reduce this flood risk. The Directive applies to inland waters as well as all coastal waters.
Overarching	
Environmental Liability Directive (2004/35/EC) (2004)	This Directive focusses on enforcement of claims against occupational activities which damage the environment. Its objective is to create "a more uniform regime for the prevention and remediation of environmental damage".
Directive on the Assessment of the certain effects of plans and programmes on the environment (SEA) (2001/42/EC) (2001)	The SEA Directive sets out the requirements for assessment of certain plans and programmes on the environment. An SEA is mandatory for plans/programmes which are prepared for agriculture, forestry, fisheries, energy, industry, transport, waste/ water management, telecommunications, tourism, town and country planning or land use and which set the framework for future developmental consent of certain projects found in the EIA Directive.

National	
Biodiversity	
Salmon and Freshwater Fisheries Act 1975	The Act sets out the legal framework in which salmon and freshwater fisheries are regulated. Aims include attempting to protect salmon and trout from commercial poaching, protecting migration routes, prevent wilful vandalism and neglect of fisheries, ensure correct licensing, and water authority approval.
JNCC and Defra - UK Post-2010 Biodiversity Framework (2012)	The development of the Framework reflects a revised direction for nature conservation, towards an approach which aims to consider the management of the environment, and to acknowledge and consider the value of nature in decision-making. The Framework sets out the common purpose and shared priorities of the UK and the four countries, and, as such, is a hugely important document, which is to be owned, governed, and implemented by the four countries.
Making Space for Nature - A review of England's Wildlife Sites (2010)	The report makes key points for establishing a strong and connected natural environment: 1) that we better protect and manage our designated wildlife sites; 2) that we establish new Ecological Restoration Zones; and 3) that we better protect our non-designated wildlife sites. That Society's need to maintain water-quality, manage inland flooding, deal with coastal erosion, and enhance carbon storage, if thought about creatively, could help deliver a more effective ecological network.
Biodiversity 2020: A strategy for England's wildlife and ecosystem services (2011)	The Strategy sets out how the UK is implementing its commitments. The aim is to halt the decline of wildlife and ecosystems for the benefit of this and future generations.
The Conservation of Habitats and Species (Amendment) (EU Exit) Regulations (2019) The Conservation of Habitats and Species Regulations (2017) (as amended)	The 2019 amendment provides changes to the Habitats and Species Regulations which would no longer work when the UK leaves the EU. The Conservation of Habitats and Species Regulations 2017 apply in the terrestrial environment and in territorial waters. The objective of the Habitats Directive is to protect biodiversity through the conservation of natural habitats and species of wild fauna and flora. It lays down rules for the protection, management and exploitation of such habitats and species. The EU Habitats and Wild Birds Directives are transposed in UK offshore waters by separate regulations.
The Invasive Alien Species (Enforcement and Permitting) Order (2019)	Aims include to prevent and manage invasive alien fauna and flora in England and Wales only.
The Great Britain Invasive Non-Native Species Strategy, Defra (2015)	The aim of the Strategy is to address INNS issues in Great Britain by minimising the risk they pose and reducing their negative impacts.
Conservation 21: Natural England's Conservation Strategy for the 21st Century (2016)	The strategy's three guiding principles are to: create resilient landscapes and seas; put people at the heart of the environment; and grow natural capital.
Climate Change	
Energy Act (2013)	The Act focuses on setting decarbonisation targets for the UK and reforming the electricity market. It aims to maintain a stable electricity supply as coal-fired power stations are retired. This includes facilitating the building of a new set of nuclear power stations and the establishment of a new regulator, the Office for Nuclear Regulation.
Defra - UK Climate Change Risk Assessment 2017 (2017)	Highlights the key climate change risks/ opportunities for the UK. These are: flooding and coastal change; risks to health, well-being, and productivity from high temperatures; shortages in the public water supply for agriculture, energy generation and industry; risks to natural capital, soils, and biodiversity; risks to domestic and international food production and trade; and pests, diseases, and invasive non-native species affecting people and the environment.
UK Climate Projections (UKCP) (2018)	The UKCP18 Projections provide a basis for studies of impacts and vulnerability and decisions on adaptation to climate change in the UK over the 21st century. The Projections will allow planners and decision-makers to make adaptations to climate change.
Climate Change Act (2008) 2050 Target Amended Order (2019)	Sets a legal framework to commit towards tackling climate change and adaptation. The Act sets a target of net zero by 2050 based upon 1990 levels.

Heritage	
The Ancient Monuments and Archaeological Areas Act (1979)	An Act to consolidate and amend the law relating to ancient monuments; to make provision for the investigation, preservation and recording of matters of archaeological or historical interest and (in connection therewith) for the regulation of operations or activities affecting such matters.
Planning (Listed Buildings and Conservation Areas) Act (1990)	An Act of Parliament that altered the laws on granting of planning permission for building works, notably including those of the listed building system in England and Wales
Historic England - Strategic Environmental Assessment, Sustainability Appraisal, and the Historic Environment (2016)	Guidance for addressing the historic environment in Strategic Environmental Assessment or Sustainability Appraisal. It identifies the recommended list of plans, programmes and policies for review, approach to baseline review, potential sustainability issues.
Historic England - The Setting of Heritage Assets, Historic Environment Good Practice Advice in Planning 3, 2nd Edition (2017)	This sets out guidance, against the background of NPPF and the related guidance given in the PPG, on managing change within the settings of heritage assets, including archaeological remains and historic buildings, sites, areas, and landscapes.
Resource Use	
Our Waste, Our Resources: A Strategy for England (2018)	Sets out how to preserve the stock of material resources by moving towards a circular economy. Aims to minimise damage to the natural environment and is aligned to the Government's 25 Year Environment Plan. Includes a blueprint for eliminating avoidable plastic waste, doubling resource productivity, and eliminating avoidable waste of all types by 2050.
Soils and Geology	
Defra - Safeguarding our Soils - A strategy for England (2009)	The primary aim is that by 2030, all England's soils will be managed sustainably, and degradation threats tackled successfully.
Water Resources	
Water UK - DWMP Framework (2021)	Drainage and Wastewater Management Plans are the new way for organisations to work together to improve drainage and environmental water quality. The framework was commissioned by Water UK in collaboration with Defra, Welsh Government, Ofwat, Environment Agency, Natural Resources Wales, Consumer Council for Water, ADEPT, and Blueprint for Water.
Marine and Coastal Access Act (2009)	The Act sets out to protect marine functions, activities, and wildlife. It sets out the provisions for Marine Conservation Zones, planning decisions, and more.
National Flood and Coastal Erosion Risk Management Strategy for England (2020)	The strategy sets out a vision of a nation ready for, and resilient to, flooding and coastal change – today, tomorrow and to the year 2100. It sets out the long-term goal for resilience to future flood and coastal erosion, and therefore protects people, the environment, and the economy.
Flood and Coastal Erosion Risk Management Policy Statement (2020)	The National Flood and Coastal Erosion Strategy informs this policy statement. Five key areas for action include: upgrading and expanding our national flood defences and infrastructure; managing the flow of water more effectively; harnessing the power of nature to reduce flood and coastal erosion risk and achieve multiple benefits; better preparing our communities; and enabling more resilient places through a catchment-based approach.
Flood risk assessments: climate change allowances (2016, updated 2021)	The guidance is for developers and their agents preparing flood risk assessments for planning applications, amongst others. Making allowances for climate change in Flood Risk Assessment will help minimise vulnerability and provide resilience to flooding and coastal change.
Water Resources Act (WRA) (2009) Amended from WRA (1991)	The Act sets out the functions the Environment Agency and introduced water quality classifications and objectives for the first time. An Act of the Parliament that regulates water resources, water quality and pollution, and flood defence.
Water Industry Act (1991)	This Act sets out the main powers and duties of the water and sewerage companies and defined the powers of the Water Services Regulation Authority (Ofwat). Note this was amended by Section 36 of the Flood and Water Management Act 2010.
Water Act (2003) (as amended) Water Act (1991) (amended from)	The 2003 Act amends the Water Resources Act and Regulations 1991 and the Water Industry Act 1991. The Act has the following four broad aims: the sustainable use of water resources; strengthening the voice of consumers; and a measured increase in competition; and the promotion of water conservation.
Preparing for a drier future: England's water infrastructure needs (2018)	This document sets out the National Infrastructure Commission's advice on how to address England's

	water supply challenges and deliver the appropriate level of resilience for the long term.
Draft National Policy Statement for Water Resources Infrastructure (2018)	The draft National Policy Statement for Water Resources Infrastructure sets out the need and government's policies for the development of nationally significant infrastructure projects relevant to water resources in England.
Protect groundwater and prevent groundwater pollution (2017)	This guidance helps with permit or licence applications You must not cause groundwater pollution.
The Water Environment (Water Framework Directive) Regulations (2003) WFD implementation in England and Wales: new and updated standards to protect the water environment (2014)	The Water Environment Regulations transpose the WFD into UK law. They aim to protect and enhance the quality of surface fresh water (including lakes, streams, and rivers); groundwaters; groundwater dependant ecosystems; estuaries; and coastal waters (out to one mile). The UK Technical Advisory Group (UKTAG) is responsible for developing environmental standards and conditions for achieving WFD requirements for rivers and lakes.
The Environment Agency's approach to groundwater protection (2018)	This guidance is for planners, applicants for environmental permits and abstraction licences, and landowners concerned with the quality and quantity of groundwater.
CIRIA – SuDS Manual (2015)	The SuDS manual incorporates the latest technical advice and adaptable processes to assist in the planning, design, construction, management, and maintenance of good SuDS. In delivering SuDS there is a requirement to meet the framework set out by the Government's 'non statutory technical standards' and the revised SuDS Manual complements these but goes further to support.
Water UK - Net Zero 2030 Roadmap (2020)	In 2020, water companies unveiled a plan to deliver a net zero water supply for customers by 2030 in the world's first sector-wide commitment of its kind. The Net Zero 2030 Route map has been developed using over a decade's worth of detailed data and provides water companies with a framework on which to develop and cost their own net zero action plans.
The Groundwater Regulations (2009)	The Groundwater Regulations transpose the European Union Groundwater Directive (2006/118/EC) into UK law. The Regulations set out how to protect groundwater from pollution by detrimental substances.
Flood and Water Management Act (2010)	Relates to the management of flooding and coastal erosion. The Act aims to reduce the flood risk associated with extreme weather, compounded by climate change. It created the role of Lead Local Flood Authority, which is the local government authority responsible for managing flood risk in the local government area. The Flood and Water Management Act was preceded by The Pitt Review of 2007.
The Water Resources Management Plan Regulations (2007)	Sets out the statutory duty for water companies to prepare and issue a Water Resources Management Plan. The duty to prepare and maintain a WRMP is set out in sections 37A to 37D of the Water Industry Act 1991. They must be prepared at least every five years and reviewed annually.
Water UK - Water Resources long term Planning Framework 2015-2065 (2016)	The primary aim of the project is to develop a high-level strategy and framework for the long-term planning of water resources for Public Water Supply in England and Wales.
Water Supply (Water Quality) Regulations (2016) (as amended)	This statutory instrument concerns water quality supplies for human consumption.
National Policy Statement for Wastewater (2012)	A framework document for planning decisions on nationally significant wastewater infrastructure.
Environment Agency - Water Resources Planning Guideline (2021)	Water companies in England or Wales must prepare and maintain a water resources management plan (WRMP). This sets out how you intend to achieve a secure supply of water for your customers and a protected and enhanced environment. The duty to prepare and maintain a WRMP is set out in sections 37A to 37D of the Water Industry Act 1991.
Urban Waste Water Treatment (England and Wales) Regulations (1994)	The Regulations transpose the EU Urban Waste Water Treatment Directive (91/271/EEC). The aim is to set out to the regulation of sewage disposal.
The Nitrate Pollution Prevention Regulations (2015)	The Regulations transpose EU Nitrates Directive (91/676/EEC) into UK law. The aim is to reduce nitrate related pollution in the water environment.
UK Marine Policy Statement (2011)	Provides the framework for preparing marine plans and the marine planning system. Marine plans put into practice the objectives for the marine environment alongside the National Planning Policy Framework (NPPF).

Defra - Catchment Based Approach: Improving the quality of our water environment (2013)	A policy framework to encourage the wider adoption of an integrated Catchment Based Approach to improving the quality of our water environment. This is important when trying to address the significant pressures placed on the water environment by diffuse pollution from both agricultural and urban sources, and widespread, historical alterations to the natural form of channels.
Environment Agency - Drought response: our framework for England (2017)	This framework tells you how drought affects England and how the Environment Agency works with government, water companies and others to manage the effects on people, business, and the environment. It aims to ensure consistency in the way we co-ordinate drought management across England.
Government's Storm Overflow Discharge Reduction Plan (the 'SORP consultation') (2022)	This aims to eliminate all harm from storm overflows in the long-term. It proposes the introduction of overflow targets which focus on high priority sites in the short-term and notes that 'Water companies must clearly set out how they will meet their storm overflow targets in their Drainage and Wastewater Management Plans'. The SORP is expected to be finalised in September 2022, as such there is some uncertainty as to the targets that will need to be achieved through the DWMP.
Overarching	
Environment Act (2021) Environment Act (1995) (as amended)	A tool to implement changes in England across environmental sectors including air quality, biodiversity, water, and waste reduction and resource efficiency. The Act includes a target to halt the decline of nature by 2030, and mandates Biodiversity Net Gain for developments.
National Planning Policy Framework (NPPF) (2021)	The updated NPPF sets out government's planning policies for England and how these are expected to be applied. A key aim is to achieve sustainable development.
A Green Future: Our 25 Year Plan to Improve the Environment (2018)	25 Year Environment Plan was published by the Government in January 2018. It sets out sets out government action to help the natural world regain and retain good health. It aims to deliver cleaner air and water in our cities and rural landscapes, protect threatened species and provide richer wildlife habitats. It calls for an approach to agriculture, forestry, land use and fishing that puts the environment first. The Plan looks forward to delivering a Green Brexit. Measures to implement the plan include consulting on setting up a new independent body to hold government to account; a new set of environmental principles to underpin policymaking; and strengthening leadership and delivery through better local planning. Policies include • 'Embedding an 'environmental net gain' principle for development, including housing and infrastructure'; • 'Supporting larger scale woodland creation'; • 'Expanding the use of natural flood management solutions'; • 'Publishing a strategy for nature'; • 'Developing a Nature Recovery Network'; • 'Increasing water supply and incentivising greater water efficiency and less personal use'; • 'Promoting health and wellbeing through the natural environment'; • 'Creating more green infrastructure'; • 'Planting more trees in and around our towns and cities'; • 'Reducing the impact of wastewater'; • 'Publishing Clean Air Strategy'; and • 'Tackling climate change'.
The Environmental Damage (Prevention and Remediation) (England) Regulations (2015)	Provides additional protection to habitats and species identified on Annexes one and two of the EC Habitats Directive (92/43/EEC), SSSIs and, in some cases, classified waterbodies from environmental damage where an operator has intended to cause damage or been negligent to the potential for damage.
The Wildlife and Countryside Act (1981) (as amended)	The Wildlife and Countryside Act is a major driver in the protection of animals, plans and habitats in the UK. It implements the Bern Convention and the Birds Directive and contains details of designated sites/species.
Environment Protection Act (1990)	The fundamental structure and authority for waste management and control of emissions into the environment.

Countryside and Rights of Way Act (2000)	Aims to give greater freedom for people to explore open countryside. It also includes a power to extend the right to coastal land.
The Natural Environment and Communities Act (2006)	NERC is designed to help achieve a rich and diverse natural environment and thriving rural communities through modernised and simplified arrangements for delivering Government policy. It is about conserving and enhancing places and nature and helping people to enjoy them.
Environmental Assessment of Plans and Programmes Regulations (2004)	This regulation transposes the SEA Directive into UK law which requires an assessment of the effects of certain plans and programmes on the environment.
National Infrastructure Strategy (2020)	The National Infrastructure Strategy sets out plans to transform UK infrastructure to level up the country, strengthen the Union and achieve net zero emissions by 2050.
Ancient Woodland and Veteran Trees: Protecting them from development (2014)	Standing advice is a 'material planning consideration'. This means you should take it into account when making decisions on planning applications. Ancient woodland is defined as an irreplaceable habitat which is important for wildlife, soils, recreational value and cultural, historical and landscape value. The advice relates to both conserving and enhancing biodiversity and reducing the level of impact of the proposed development on areas of ancient woodland and ancient/ veteran trees.
Climate change approaches in water resources planning – overview of new methods (2013)	The aim of the project was to examine how climate change has been built into water resource management plans (WRMPs) to date, and to recommend best and appropriate practice for the future, with particular reference to the use of the detailed tools and probabilistic climate data in UKCP09.
Regional and Local	
Biodiversity	
Local Nature Recovery Strategies	The Environment Act 2021 introduced Local Nature Recovery Strategies for areas in England. Public authorities will have duties in relation to these.
Biodiversity Action Plans	Local biodiversity action plan objectives include those associated with maintaining and safeguarding the current extent of protected designations and recognised habitats and achieving favourable status for these areas. Each National Park has a Biodiversity Action Plan, and some local authorities have their own or a combined one with neighbouring authorities.
The North East England Nature Partnership	The partnership brings together seven of the regions Local Authorities, NGO's, business, and Defra agencies to achieve environmental growth by investing in natural capital, as envisioned in the 20-year Vision for Environmental Growth. The Regional Plan should consider the objectives of the partnership.
Heritage	
Heritage Coast Management Plans	Heritage coasts are 'defined' rather than designated, so there is not a statutory designation process like that associated with national parks and areas of outstanding natural beauty (AONB). They were established to conserve the best stretches of undeveloped coast in England. A heritage coast is defined by agreement between the relevant maritime local authorities and Natural England. Durham Heritage Coast Partnership was highlighted as one example in Scoping consultation and is a partnership of authorities, agencies, and community bodies with an interest in the coast in Sunderland, Durham, and Hartlepool.
Landscape	
Natural England, AONB Management Plans	These plans include an assessment of the special quality of the AONB, such as a landscape character assessment that includes its condition and vulnerability to change and a monitoring plan to show how you will measure the AONB's condition and effectiveness of management. The following Plans are relevant: Northumbria Coast 2020 – 2024 and the North Pennines 2019 to 2024.
Natural England National Character Area (NCA) Profiles (2013/ 2014)	The profiles summarize the characteristics which are unique to that local area and gives it a distinctive sense of place. There are 15 NCA identified within the North East. NCA beyond this could be potentially impacted but that is unknown at Scoping stage.

Landscape Character Assessments: County Durham Landscape Character Assessment (2019), County Durham Landscape Strategy (2008) Northumberland Landscape Character Assessment (2010)	These map, classify and describe the landscape character (i.e., the distinct set of elements that makes a landscape recognisable, and gives it a unique 'sense of place') at the county scale. They inform development as well as land use and management and include guidance on the management of future change.
Water Resources	
Defra and Environment Agency (2015) River Basin Management Plans	River basin management plans (RBMPs) set out how organisations, stakeholders and communities will work together to improve the water environment. Only the Northumbria RBMP is anticipated to be referenced.
Water Resources North (WReN) Regional Plan – Environmental Assessment - Scoping Report (2021)	Northumbrian Water, Yorkshire Water, and Hartlepool Water make up WReN's core companies. Water Resources North (WReN) is one of five regional water resources groups working under the National Framework for Water Resources (the 'National Framework'). The draft Regional Plan in anticipated to be ready in early 2022 which will be accompanied by the associated assessment reports.
Environment Agency - Abstraction licensing strategies (CAMS process) (2013)	These Licensing Strategies set out how water resources are managed. It provides information about where water is available for further abstraction and an indication of how reliable a new abstraction licence may be.
Flood Risk	
Environment Agency - Catchment Flood Management Plans (CFMPs) (2009)	CFMPs set out the risk for each catchment in relation to flooding from rivers, tidal, surface water, groundwater, and reservoirs, but not directly from sea/coastal flooding which is under the remit of a Shoreline Management Plan. The role of the CFMPs is to establish flood risk management policies which will deliver sustainable flood risk management for the long term.
Local Flood Risk Management Strategies – examples include: Newcastle City Council Local Flood Risk Management Plan (2016) Gateshead Council Level 1 Strategic Flood Risk Assessment (2019) Sunderland Council Level 1 Strategic Flood Risk Assessment (2020) Durham County Council SFRA (2018) and Local Flood Risk Management Strategy 2016-2020 (2017)	These set out useful local information and identifies objectives to manage local flood risk to local communities. They consider all sources of local flood risk such as surface water, groundwater, and ordinary watercourses. These local authority documents usually feed into Local Development Plans, Green Infrastructure Plans, and other documents.
Water Cycle Studies e.g., Durham County Council Water Cycle Study (2018)	Set out the water-based infrastructure required to support new development identified through local development plans
Marine Management Organisation North East Inshore and Offshore Marine Plan (2021)	The North East Marine Plan provides a framework that will shape and inform decisions over how the areas' waters are developed, protected, and improved over the next 20 years. It covers an area of around 56,000 square kilometres of inshore and offshore waters stretching from the Scottish border to Flamborough Head, in Yorkshire. It contains large stretches of undeveloped, open coastline to the north and the south alongside important, busy industrial or formerly industrial estuaries.
Northumbrian Coastal Authorities Group Shoreline Management Plans: Scottish Border to River Tyne SMP2 (2009) River Tyne to Flamborough Head SMP2 (2007)	Shoreline management plans are developed by Coastal Groups with members mainly from local councils and the Environment Agency. They identify the most sustainable approach to managing the flood and coastal erosion risks to the coastline in the short-term (0 to 20 years); medium term (20 to 50 years); and long term (50 to 100 years).
North-East Lead Local Flood Authorities Sustainable Drainage Local Standards	This guidance provides the approach that the North East LLFA will take on some key questions often asked through the planning process by developers with the aim to improve the submission of flood risk assessments, drainage strategies, and SuDS design and to promote consistency and best practice.

Overarching	
Local Development Plans and Green Infrastructure Plans (GIPs).	Local Development Plans are the main framework for planning in local authorities and set out the long-term spatial concept. They include policies for sustainable development including environmental, social, and economic. GIPs set out the details on the provision and access to quality green spaces. The following local authorities are located within the Study Area and therefore their Local Plans are relevant: Northumberland; County Durham; Hartlepool; Darlington; Redcar & Cleveland; Stockton-on-Tees; Middlesbrough; North Tyneside; Newcastle upon Tyne; Gateshead; South Tyneside; Sunderland; Richmondshire; Hambleton; Scarborough; Ryedale; Carlisle; Eden; and the Scottish Borders
Defra, Public Rights of Way Improvement Plans (ROWIPs)	ROWIPs outline how local authorities aim to enhance public rights of way to ensure improved accessibility, connectivity, and quality of the network.
National Park Management Plans: Northumbria 2016- 2021 (2016) Yorkshire Dales 2019 – 2024 (2019) North York Moors 2017 – 2022 (2017)	Every National Park has a National Park Management Plan. It is the most important document for the National Park, setting out how the National Park and partners will work together to achieve shared objectives for the future management of the National Park. The Plans aim to achieve the long-standing vision for the respective parks.
Water/ Wastewater Company - Northumbria Water	
Water Resources	
Business Plan – Living Water Our Plan for 2020 – 2025 and beyond	There are six themes where the report is focussing on. The key one for the SEA is likely to be 'Improving the Environment'.
Business Plan – Shaping our Future 2018 – 2040	This is a future vision statement. This document sets out how NWS plan to build on strengths and develop further as a customer focused business in order to anticipate, respond to and exceed our customers' expectations in the future.
Drought Plan – Draft Drought Plan 2022	The Drought Plan identifies management of future droughts. It identifies what measures are available to reduce demand and support supplies and what triggers can be used to identify when actions are required. The Plan also outlines how a company will communicate with customers during a drought. Consider adjoining water companies if applicable.
Northumbria Water Resource Management Plan (WRMP) (2019)	Sets out how we will provide a reliable and sustainable supply of water to our customers. Consider adjoining water companies if applicable.

APPENDIX C: BASELINE ENVIRONMENT REVIEW

Baseline Environment Review

1.1 Biodiversity and Geodiversity

Biodiversity can be defined as the variety of plants (flora) and animals (fauna) within an area. The importance of maintaining and improving biodiversity is recognised from a local scale up to the international scale. Geodiversity refers to the geology and soils and their resulting land use. Please note, there is a separate landscape topic which focusses more on land use within the context of landscape. Data for the Biodiversity and Geodiversity topic mostly relates to internationally and nationally designated sites which have the highest level of protection within the UK and are home to some of the highest value biodiversity. It is recognised that biodiversity and geodiversity value extend beyond these designated sites, not only to other local/regional designated sites, priority habitats and species, but also to the connectivity between habitats.

Ramsar Sites are wetlands of international importance designated under the Ramsar Convention. Five Ramsar Sites intersect Level 1 (whole Study Area) and are listed in **Table 1.1.1** and are shown on the accompanying maps at the end of this appendix.

Special Areas of Conservation (SAC) are protected areas under the Conservation of Habitats and Species Regulations 2017 (as amended) which require establishment of a national site network of important high-quality conservation sites that will make a significant contribution to conserving the habitats and species. Twenty SACs are located within Level 1 and are listed in **Table 1.1.1** and are shown the accompanying maps. SACs can include marine components to protect habitat and/ or species associated with the in-proximity marine environment.

Special Protection Areas are protected areas for birds under the Conservation of Habitats and Species Regulations 2017 (as amended). Eight Special Protection Areas, made up of 74 individual areas, are located within Level 1 and are listed in **Table 1.1.1** and are shown on the accompanying maps. These can include marine components to protect bird species that are dependent on the marine environment for all or part of their lifecycle.

SACs and SPAs for part of the national site network. Many of these areas overlap with Ramsar sites.

A Site of Special Scientific Interest (SSSI) describes an area that is of particular interest to science due to the rare species of fauna or flora it contains or important geological or physiological features that may lie within its boundaries. 256 SSSIs fall within Level 1 and are listed in **Table 1.1.1** and are shown on the accompanying maps.

National Nature Reserves (NNRs) were established to protect some of the most important habitats, species and geology, and to provide ‘outdoor laboratories’ for research. Fourteen NNRs intersect Level 1 and are listed in **Table 1.1.1** and are shown on the accompanying maps.

Marine Conservation Zones (MCZs) are areas designated by Ministerial Orders to protect a range of nationally important, rare, or threatened marine habitats and species. Two MCZs intersect both the Northumberland and Tyneside Level 2 areas and are listed in **Table 1.1.1.**

No biosphere reserves are present in the region.

Due to the strategic nature of SEA, local sites are not included in the Environmental Report, and these include Sites of Importance for Nature Conservation (SINCs); Local Wildlife Sites; and Local Nature Reserves. Local Nature Reserves are statutory designations made under Section 21 of the National Parks and Access to the Countryside Act 1949 and amended by Schedule 11 of the Natural Environment and Rural Communities Act 2006, by principal local authorities. These will need further consideration when options are further developed as well as location specific biodiversity constraints and opportunities.

There are specific national and trans-national policies that apply to certain species such as shellfish or eel which should be followed where these are applicable to specific options at the plan implementation stage. There are seven Level 3 catchments in locations which are designated as either a bathing or shellfish water, with further catchments in close proximity (and potentially hydrologically linked). The seven catchments were found across the wider Level 1 in Northumberland, Wearside and Teesside. Both regionally, and nationally, there is public and political focus on untreated wastewater discharge and the socio-economic/ environmental impact for shellfish and other species[1]. Untreated wastewater will have a negative impact on the receiving environment which will impact species health, which in turn can negatively impact the wider ecosystem.

Table 1.1.1 – Intersecting Sites for Biodiversity

Biodiversity Dataset	List of intersecting Sites within the CL		
Ramsar	• Holburn Lake & Moss • Northumbria Coast	• Lindisfarne • Irthinghead Mires	• Teesmouth & Cleveland Coast
SAC	• Ford Moss • Tyne & Nent • Newham Fen • Thrislington • Castle Eden Dene • Durham Coast • Border Mires Kielder-Butterburn • Simonside Hills	• Harbottle Moors • Tyne & Allen River Gravels • Roman Wall Loughs • North Pennine Dales Meadows • Tweed Estuary • River Tweed • Moor House-Upper Teesdale	• Berwickshire & North Northumberland Coast (includes marine components) • North Northumberland Dunes • North York Moors • North Pennine Moors
Special Protection Area	• Teesmouth & Cleveland Coast (includes marine components) • Holburn Lake & Moss	• Coquet Island (includes marine components) • Lindisfarne (includes marine components) • Northumberland Marine (includes marine components)	• Northumbria Coast • North York Moors • North Pennine Moors
SSSI	• Allen Confluence Gravels • Allendale Moors • Allolee to Walltown • Alnmouth Saltmarsh and Dunes • Alston Shingle Banks • Appleby Fells • Arcot Hall Grassland and Ponds • Arkengarthdale, Gunnerside and Reeth Moors	• Fairy Holes Cave • Fallowfield Mine • Fallowlees Flush • Far High House Meadows • Fishburn Grassland • Ford Moss • Foster's Hush • Frog Wood Bog • Fulwell & Carley Hill Quarries • Geltsdale & Glendue Fells • Gibside • Gilleylaw Quarry • Glebe Quarry	• Park End Wood • Peckriding Meadows • Peckriding Top Lot • Pig Hill • Pike Whin Bog • Pinkney and Gerrick Woods • Pittington Hill • Pockerley Farm Pond • Pow Hill Bog • Prestwick Carr • Quarrington Hill Grasslands • Railway Stell West

[1] BBC News (2022) Saltburn protest held over dead crustaceans and sea pollution, available from: https://www.bbc.com/news/uk-england-tees-59166814 , accessed March 2022.

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	• Aules Hill Meadows • Backstone Bank and Baal Hill Woods • Baldersdale Woodlands • Bamburgh Coast and Hills • Bamburgh Dunes • Barelees Pond • Barrow Burn Meadows • Barrow Meadow • Bavington Crags • Beltingham River Shingle • Bewick and Beanley Moors • Big Waters • Billsmoor Park and Grasslees Wood • Bishop Middleham Quarry • Black Scar Quarry • Blagill Mine • Boldon Pastures • Bollihope, Pikestone, Eggleston and Woodland Fells • Botany Hill • Botton Head • Boulby Quarries • Bowes Moor • Bowlees and Friar House Meadows • Brada Hill • Bradford Kames • Brasside Pond • Brenkley Meadows • Briarcroft Pasture • Briarwood Banks • Brignall Banks • Broughton Bank • Brunton Bank Quarry • Burnfoot River Shingle and Wydon Nabb • Burnhope Burn • Butterby Oxbow • Campfield Kettle Hole • Cassop Vale • Castle Eden Dene • Castle Point to Cullernose Point • Catton Lea Meadow • Causey Bank Mires • Charity Land • Claxheugh Rock & Ford Limestone Quarry • Cleadon Hill • Cliff Ridge • Close House Mine	• God's Bridge • Gosforth Park • Grains O'th' Beck Meadows • Green Croft and Langley Moor • Greenfoot Quarry • Greenhaugh Meadow • Greenleighton Quarry • Gunnerton Nick • Hadston Links • Haggburn Gate • Haggs Bank • Hallow Hill • Hannah's Meadows • Harbottle Moors • Hareshaw Dene • Hart Bog • Harthope Burn • Hartley Cleugh • Harton Down Hill • Hastings Hill • Hawthorn Cottage Pasture • Hawthorn Dene • Hawthorn Quarry • Heatheryburn Bank • Hell Kettles • Herrington Hill • Hesledon Moor East • Hesledon Moor West • Hesleyside Park • Hetton Bogs • Hexhamshire Moors • High Haining Hill • High Knock Shield Meadow • High Moorsley • Hisehope Burn Valley • Holburn Lake and Moss • Holystone Burn Woods • Holystone North Wood • Holywell Pond • Howick to Seaton Point • Hulam Fen • Humbledon Hill Quarry • Humbleton Hill and The Trows • Hunder Beck Juniper • Hylton Castle Cutting • Joe's Pond • Kielder Mires • Kielderhead and Emblehope Moors • Kildale Hall • Kilmond Scar • Knarsdale Meadows • Lambley River Shingles • Lampert Mosses • Langbaurgh Ridge • Linbrigg • Lindisfarne • Longhorsley Moor • Longhoughton Quarry	• Raisby Hill Grassland • Raisby Hill Quarry • Ramsey's Burn Wood • Redcar Field • Redesdale Ironstone Quarries • Ridley Gill • Rigg Farm and Stake Hill Meadows • River Coquet and Coquet Valley Woodlands • River Nent at Blagill • River South Tyne and Tynebottom Mine • River Tyne at Ovingham • River West Allen at Blackett Bridge • Roddam Dene • Rogerley Quarry • Roman Wall Escarpments • Roman Wall Loughs • Roseberry Topping • Ryton Willows • Saltburn Gill • Settlingstones Mine • Sherburn Hill • Shibdon Pond • Shipley and Great Woods • Simonside Hills • Sleightholme Beck Gorge - The Troughs • Slit Woods • Smallcleugh Mine • South Hylton Pasture • Spindlestone Heughs • Stawardpeel Woods • Stonecroft Mine • Stony Cut, Cold Hesledon • Strother Hills • Teesdale Allotments • Teesmouth and Cleveland Coast • The Allers and Lilburn Valley Junipers • The Bog • The Bottoms • The Carrs • The Cheviot • Thorneyburn Meadow • Thornley Wood • Thrislington Plantation • Till Riverbanks • Tipalt Burn • Town Kelloe Bank • Trimdon Limestone Quarry • Tunstall Hills and Ryhope Cutting • Tuthill Quarry • Tweed Catchment Rivers - England: Lower Tweed and Whiteadder • Tweed Catchment Rivers - England: Till Catchment

	• Close House Riverside • College Valley Woodlands • Colour Heugh and Bowden Doors • Coquet Island • Corbridge Limestone Quarry • Cornriggs Meadows • Cotherstone Moor • Cottonshope Head Quarry • Crag Gill • Cresswell and Newbiggin Shores • Cresswell Ponds • Crime Rigg Quarry • Dabble Bank • Darras Hall Grassland • Dawson's Plantation Quarry • Derwent Gorge & Horsleyhope Ravine • Durham Coast • Durtrees Burn Grassland • Eppleton Grassland	• Lovell Hill Pools • Low Hauxley Shore • Low Redford Meadows • Lower Derwent Meadows • Lune Forest • Mere Beck Meadows • Middle Crossthwaite • Middle Side & Stonygill Meadows • Middleton Quarry • Middridge Quarry • Mill and Whiskershiel Burns • Monk Wood • Moorhouse and Cross Fell • Moorsley Banks • Muckle Moss • Muggleswick,Stanhope & Edmundbyers Commons & Blanchland Moor • Neasham Fen • New Hartley Ponds • New Scroggs • Newham Fen • Newton Ketton Meadow • Newton Links • Ninebanks River Shingle • North York Moors • Northumberland Shore • Old Moss Lead Vein • Otterburn Mires	• Tyne Watersmeet • Tynemouth to Seaton Sluice • Upper Teesdale • Waldridge Fell • Warks Burn Woodland • Warkworth Dunes and Saltmarsh • Wear River Bank • West Farm Meadow, Boldon • West Newlandside Meadows • West Park Meadows • West Rigg Open Cutting • Westernhope Burn Wood • Wharmley Riverside • White Ridge Meadow • Whitesike Mine and Flinty Fell • Whitfield Moor, Plenmeller and Ashholme Commons • Whitton Bridge Pasture • Williamston River Shingle • Willow Burn Pasture • Wingate Quarry • Witton-le-Wear • Yoden Village Quarry
NNR	• Cassop Vale • Newham Bog • Kielder Mires • Kielderhead • Muckle Moss	• Thrislington • Whitelee Moor • Greenlee Lough • Castle Eden Dene • Durham Coast	• Teesmouth • Derwent Gorge and Muggleswick Woods • Moor House-Upper Teesdale • Lindisfarne.
MCZ	• Coquet to St Marys (UKMCZ0030)	• Berwick to St Mary's (UKMCZ0055).	

Priority Habitats were those that were identified as being the most threatened and requiring conservation action under the UK Biodiversity Action Plan. These habitats are now listed in section 41 of the Natural Environment and Rural Communities (NERC) Act and called 'Habitats of Principal Importance'. They are important habitats for wildlife and protection from harmful development is supported by the NERC Act and the National Planning Policy Framework (NPPF). There are a range of designated NERC Act Section 41 habitats within Level 1 which are listed below. NWG has a duty to have regard to the conservation and enhancement of biodiversity in exercising its function relating to habitats and species of principal importance (with the 'enhance' requirement recently introduced through the Environment Act).

- Blanket bog
- Calaminarian grassland
- Coastal and floodplain grazing marsh
- Coastal saltmarsh
- Coastal sand dunes
- Deciduous woodland
- Fragmented heath

- Good quality semi-improved grassland
- Grass moorland
- Limestone pavement
- Lowland calcareous grassland
- Lowland dry acid grassland
- Lowland fens
- Lowland heathland
- Lowland meadows
- Lowland raised bog
- Maritime cliff and slope
- Mountain heaths and willow scrub
- Mudflats
- No main habitat but additional habitats present
- Purple moor grass and rush pastures
- Reedbeds
- Saline lagoons
- Traditional orchard
- Upland calcareous grassland
- Upland flushes, fens, and swamps
- Upland hay meadow
- Upland heathland

In recognition of the importance of connectivity between habitats (which increases resilience to climate change), Habitat Networks have been mapped by Natural England at the national scale. This network covers approximately half of the total study area with upland areas to the north and west having greatest coverage, often correlating to National Parks, in particular Northumberland. The Environment Act states that 'a local nature recovery strategy for an area is to be prepared and published by the responsible authority' – this might be a local authority, national park, Natural England, or Mayor for the area of a combined authority.

Provisional Agricultural Land Classification groups land into five grades and are shown on the accompanying maps. Grade one is the best quality and grade five is poorest. Several criteria are used for assessment and include climate, site (gradient, micro-relief, flood risk) and soil. Agricultural land classification covers the entire CL. Outside of urban areas, most central and eastern areas are Grade three. Generally, areas to the west of the region, including Northumberland National Park, become more elevated and agricultural land becomes lower in grade with areas of moorland or lower quality grass pasture increasingly common in upland areas. No part of the Level 1 area is ranked as Grade one land which is the highest quality agricultural land within the UK.

The geodiversity of the North East impacts its diverse landscape which outside of urban areas, allows for a variety of farming uses. Defra data for the North East region for 2019 shows that grazing livestock farms accounted for 55% of farmed area, and that cereal farms covered an additional 22% of farmed area[2].

[2] GOV.UK (2022) Agriculture Regional Profiles 2019, available at: Agricultural facts: England regional profiles - North East (publishing.service.gov.uk), accessed May 2022.

The geology across the region, including bedrock and superficial, is greatly varied. According to BGS[3] and England's North East[4], there are:

- Areas of carboniferous limestones to the south and east.
- Older igneous rock formations to the north and west including the Great Whin Sill which is a key feature of the Northern Pennines and Northumberland.
- Coal Measures are present within various parts of the region.
- Coal Measures, Millstone Grit, Upper and Lower Limestone dominate the geology of the upper Wear catchment.
- Coal Measures and Magnesian Limestone dominate in the middle and lower reaches of the Wear and in the locality of East Durham to the coast.
- The North Pennines of Durham and Northumberland were historical producers of lead and iron.
- The variation of geology reflects soils and the agricultural value and generally, clay-based soils dominate Northumbria in lower areas, with peaty soils in the uplands.

LIKELY FUTURE WITHOUT THE PLAN
Development is likely to increase the risk of habitat loss and fragmentation, particularly outside of the extensive designated areas. The recent Environment Act requires a biodiversity net gain from developments where planning permission is required. The Defra 25 Year Environment Plan includes a commitment to restore 75% of terrestrial and freshwater protected sites to favourable condition and to create or restore 500,000 hectares of wildlife-rich habitat outside the protected site network, focusing on priority habitats as part of a wider set of land management changes providing extensive benefits. Climate change will impact wildlife in the future by various means including, but not limited to, drought, timing of seasonal activities, higher frequency of storms, native species redistribution, invasive non-native species, and increased potential for wildfire. Changing climate could impact on the quality of soils across the region through temperature extremes and changing rainfall patterns. Population is expected to increase in the region, although less than other regions. This alongside trends observed in Covid-19, such as increased home working, could put increased demand on greenfield development, which in turn will lead to loss of agricultural land.

1.2 Human Health

The North East had a 2018 population of approximately 2,658,000. The projected population growth is expected to be 2.3% to a 2028 population of 2,719,000. This is below the national projected growth of 5% between 2018 and 2028[5] and is the lowest for all English regions. The level of growth is being taken into account through the modelling of the DWMP options.

The North East has had lower life expectancy compared to the whole of England for many decades. Data released in September 2020 showed that the lowest regional life expectancy for both males and females in 2017 to 2019 was observed in the North East and that the North East's life expectancy at birth was also lower than in the countries of Wales and

[3] BGS (2022) Geology of Britain Viewer, available from: Geology of Britain viewer | British Geological Survey (BGS), accessed March 2022.
[4] England's North East (2020) Rocking the Region's History, available from: https://englandsnortheast.co.uk/2020/10/15/rocking-the-regions-history/ , accessed March 2022.
[5] Office for National Statistics (2020) Subnational population projections for England: 2018-based

Northern Ireland, but higher than Scotland[6]. This date range was used prior to Covid-19 which impacted the UK from early 2020 onwards.

Health profiles are published by Public Health England and record multiple indicators which collectively provide a summary for human health on a local authority scale. Data such as mortality rates, rates of cardiovascular diseases, cancer rates, and more can all be reviewed. The North East region includes data from the local authorities listed in **Table 1.1.2** which sets out key findings from each health profile[7]: As set out, the overall trend is that the North East has below national averages for most indicators[8].

Table 1.1.2. – Key findings from each health profile

Local Authority	Summary of key findings
County Durham	• "The health of people in County Durham is varied compared with the England average. About 21.8% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 8.8 years lower for men and 6.6 years lower for women in the most deprived areas of County Durham than in the least deprived areas." • "In Year 6, 22.4% of children are classified as obese, worse than the average for England. The rate for alcohol-specific hospital admissions among those under 18 is 55 per 100,000, worse than the average for England." • "The rates of violent crime (hospital admissions for violence), under 75 mortality rate from cardiovascular diseases and under 75 mortality rate from cancer are worse than the England average".
Darlington	• "The health of people in Darlington is varied compared with the England average. About 20% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 13.7 years lower for men and 9.5 years lower for women in the most deprived areas of Darlington than in the least deprived areas." • "In Year 6, 22.5% of children are classified as obese. The rate for alcohol-specific hospital admissions among those under 18 is 52 per 100,000, worse than the average for England."
Gateshead	• "The health of people in Gateshead is generally worse than the England average. About 20.9% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 10.6 years lower for men and 9.3 years lower for women in the most deprived areas of Gateshead than in the least deprived areas." • "In Year 6, 24.2% of children are classified as obese, worse than the average for England. The rate for alcohol-specific hospital admissions among those under 18 is 63 per 100,000, worse than the average for England."
Hartlepool	• "The health of people in Hartlepool is generally worse than the England average. Hartlepool is one of the 20% most deprived districts/unitary authorities in England and about 28.6% (5,020) children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 12.5 years lower for men and 10.4 years lower for women in the most deprived areas of Hartlepool than in the least deprived areas." • In Year 6, 26.9% of children are classified as obese, worse than the average for England. The rate for alcohol-specific hospital admissions among those under 18 is 42 per 100,000." • "The rates of statutory homelessness, violent crime (hospital admissions for violence), under 75 mortality rate from cardiovascular diseases, under 75 mortality rate from cancer and employment (aged 16-64) are worse than the England average."
Middles-brough	• "The health of people in Middlesbrough is generally worse than the England average. Middlesbrough is one of the 20% most deprived districts/unitary authorities in England

[6] ONS (2022) Life Expectancy, available at: Life expectancy for local areas of the UK - Office for National Statistics (ons.gov.uk), accessed March 2022.
[7] Office for Health Improvement and Disparities (2019) Local Authority Health Profile Reports, available at: https://fingertips.phe.org.uk/profile/health-profiles/area-search-results/E12000001?place_name=North%20East&search_type=list-child-areas, accessed March 2022.
[8] Public health England (2022) Health Profiles, available at: Local Authority Health Profiles - PHE, accessed March 2022.

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	and about 31.8% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 12.6 years lower for men and 12.0 years lower for women in the most deprived areas of Middlesbrough than in the least deprived areas." • "In Year 6, 24.7% of children are classified as obese, worse than the average for England. The rate for alcohol-specific hospital admissions among those under 18 is 41 per 100,000." • "The rates of violent crime (hospital admissions for violence), under 75 mortality rate from cardiovascular diseases, under 75 mortality rate from cancer and employment (aged 16-64) are worse than the England average."
Newcastle upon Tyne	• "The health of people in Newcastle upon Tyne is generally worse than the England average. Newcastle upon Tyne is one of the 20% most deprived districts/unitary authorities in England and about 24.7% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 13.1 years lower for men and 8.8 years lower for women in the most deprived areas of Newcastle upon Tyne than in the least deprived areas." • "In Year 6, 24.6% of children are classified as obese, worse than the average for England. The rate for alcohol-specific hospital admissions among those under 18 is 43 per 100,000, worse than the average for England." • "The rates of statutory homelessness, violent crime (hospital admissions for violence), under 75 mortality rate from cardiovascular diseases, under 75 mortality rate from cancer and employment (aged 16-64) are worse than the England average."
North Tyneside	• "The health of people in North Tyneside is varied compared with the England average. About 17.1% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 11.5 years lower for men and 10.7 years lower for women in the most deprived areas of North Tyneside than in the least deprived areas." • "In Year 6, 21.6% of children are classified as obese. The rate for alcohol-specific hospital admissions among those under 18 is 85 per 100,000, worse than the average for England." • "The rates of violent crime (hospital admissions for violence), under 75 mortality rate from cardiovascular diseases and under 75 mortality rate from cancer are worse than the England average."
North-umberland	• "The health of people in Northumberland is varied compared with the England average. About 17.2% children live in low income families. Life expectancy for women is lower than the England average." • "Life expectancy is 10.2 years lower for men and 8.8 years lower for women in the most deprived areas of Northumberland than in the least deprived areas." • "In Year 6, 18.9% of children are classified as obese. The rate for alcohol-specific hospital admissions among those under 18 is 51 per 100,000, worse than the average for England." • "The rates of violent crime (hospital admissions for violence) and employment (aged 16-64) are worse than the England average."
Redcar and Cleveland	• "The health of people in Redcar and Cleveland is generally worse than the England average. Redcar and Cleveland are one of the 20% most deprived districts/unitary authorities in England and about 25.2% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 11.0 years lower for men and 7.3 years lower for women in the most deprived areas of Redcar and Cleveland than in the least deprived areas." • "In Year 6, 22.1% of children are classified as obese. The rate for alcohol-specific hospital admissions among those under 18 is 55 per 100,000, worse than the average for England." • "The rates of under 75 mortality rate from cardiovascular diseases, under 75 mortality rate from cancer and employment (aged 16-64) are worse than the England average."
South Tyneside	• "The health of people in South Tyneside is generally worse than the England average. South Tyneside is one of the 20% most deprived districts/unitary authorities in England and about 26.4% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 9.3 years lower for men and 8.1 years lower for women in the most deprived areas of South Tyneside than in the least deprived areas." • "In Year 6, 25.3% of children are classified as obese, worse than the average for England. The rate for alcohol-specific hospital admissions among those under 18 is 107 per 100,000, worse than the average for England."

	• "The rates of violent crime (hospital admissions for violence), under 75 mortality rate from cardiovascular diseases, under 75 mortality rate from cancer and employment (aged 16-64) are worse than the England average."
Stockton-on-Tees	• "The health of people in Stockton-on-Tees is generally worse than the England average. About 21.3% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 15.2 years lower for men and 13.8 years lower for women in the most deprived areas of Stockton-on-Tees than in the least deprived areas." • "In Year 6, 19.5% of children are classified as obese. The rate for alcohol-specific hospital admissions among those under 18 is 46 per 100,000, worse than the average for England." • "The rates of violent crime (hospital admissions for violence), under 75 mortality rate from cancer and employment (aged 16-64) are worse than the England average."
Sunderland	• "The health of people in Sunderland is generally worse than the England average. Sunderland is one of the 20% most deprived districts/unitary authorities in England and about 23.6% children live in low income families. Life expectancy for both men and women are lower than the England average." • "Life expectancy is 11.5 years lower for men and 8.5 years lower for women in the most deprived areas of Sunderland than in the least deprived areas." • "In Year 6, 24.8% of children are classified as obese, worse than the average for England. The rate for alcohol-specific hospital admissions among those under 18 is 86 per 100,000, worse than the average for England." • "The rates of violent crime (hospital admissions for violence), under 75 mortality rate from cardiovascular diseases, under 75 mortality rate from cancer and employment (aged 16-64) are worse than the England average."

There are numerous Public Rights of Way (PRoW) and cycle network routes across the region and access is an important part of policy for many designated sites, and these should be considered on an individual design basis. There is an opportunity for option such as blue/ green infrastructure to link to these. Any temporary or permanent closures or diversions to PRoW will need to be considered by the respective Local Planning Authority.

LIKELY FUTURE WITHOUT THE PLAN
An expected 2.3% growth in population will bring opportunities and challenges to the region. The age profile across the whole UK is ageing and this also puts additional pressures on public finance and services. Many pieces of long-standing legislation such as the National Planning Policy Framework (NPPF) have promoted green areas and improved access, and this has also become more emphasised across other policies and plans. There is also greater emphasis on future development being more focused towards brownfield sites and urban areas providing greater access to green spaces.

1.3 Socio-economic

The North East had an unemployment rate (aged 16 and over) of 5.1% in the data published from July to September 2021 at the time of writing the Scoping Report. This was 0.8% above the national average of 4.3%. The Covid-19 pandemic may have impacted unemployment rates; however, it is anticipated that this effect would be even across all regions of the UK when comparing the data. The latest data, at the time of writing this Baseline Environmental Review, was published for November 2021 to January 2022 shows that the region had an unemployment rate (aged 16 and over) of 5.5% compared to the national average for England of 4.1%[9]. This is a difference of 1.4% and an increase since the data published between July and September last year.

[9] ONS (2021) Labour market in the regions of the UK: March 2022, Available from: Labour market in the regions of the UK - Office for National Statistics, accessed March 2022.

The English Indices of Multiple Deprivation (IMD) measures relative levels of deprivation in over 30,000 small areas or neighbourhoods, formally called Lower-layer Super Output Areas, in England. The 2019 IMD collects data from seven domains including income, employment, education, health, crime, barriers to housing/ services and living environment, which collectively give each neighbourhood a ranked score and are shown on the accompanying maps. The north east has a high number of areas within the lowest 10% of this national rank system. Specifically, Middlesbrough is the local authority district with the highest national proportion of neighbourhoods in the most deprived 10% at 48.8%. Hartlepool has the tenth highest percentage for the same criteria at 36.2%.

Overnight tourism has been estimated for each region in the UK by Visit Britain with a breakdown of tourism trips by region of residence and region visited (millions). North East England had over 4.2 million overnight trips in 2019 (pre-Covid19)[10]. This perhaps reflects the pull factor of the region with its abundance of beautiful landscapes and protected areas.

There are two international airports in the region, Newcastle and Teesside which are shown on the accompanying maps. There are numerous major A Roads and motorways within the region as well as an important rail network. The North East is also home to significant ports including the Ports of Tees and Hartlepool which are collectively ranked as the sixth largest by cargo handling capacity in the UK[11]. The ports of Tees and Hartlepool are situated 10km away from each other and have important links to oil production in the North Sea.

LIKELY FUTURE WITHOUT THE PLAN
Uncertainty over inflation, the cost-of living crisis and government debt incurred during Covid-19 may impact the economy for years to come. The impact of Brexit may affect the North East disproportionately due to the economic presence of important ports, although Teesside (including Teesside International Airport; the Port of Middlesbrough; the Port of Hartlepool; and more) along with seven areas outside of the region were announced as freeports in March 2021 which is anticipated to bring benefits[12]. Employment rates in the future are uncertain owing to the circumstances listed above, as is the performance of the North East against other regions. Government focus on levelling up has been prominent but so far this is not directly reflected within many plans or policies. Given this, and the short-term trend seen between data in summer 2021 to Winter 2021/2022, it can be anticipated that employment rates will remain behind the UK average. Investment in infrastructure is likely to remain moderate to high in the medium-term with optioneering currently underway for upgraded and new infrastructure.

1.4 Carbon & Material Assets

The North East is a key industrial heartland for the UK and the desire to grow the North East's economy adds pressure to energy and resource demand. Whilst population growth rate in the region is one of the lowest in the country, development will be required to meet the anticipated growth. This is likely to increase pressure on land use. Nationally there is a preference for sustainable use of land through reuse of previously developed land. Green Belt plays an important role in planning and primarily aims to reduce urban sprawl. Large areas of Green Belt surround urban centres such as Newcastle, Sunderland and Durham. The local authorities with Green Belt areas include Newcastle upon Tyne; North Tyneside;

[10] Visit Britain (2019) Available from: Great British Tourist Report 2019 (visitbritain.org) , accessed March 2022.
[11] UK Ports (2019) What are the 10 largest ports in the UK? Available from: https://www.ukports.com/what-are-the-10-largest-ports-in-the-uk, accessed March 2022.
[12] GOV.UK (2021) Freeports Guidance. Available from: Freeports - GOV.UK (www.gov.uk), accessed March 2022.

South Tyneside; Sunderland; Northumberland; Gateshead; and Durham and are shown on the accompanying maps.

Newcastle and Sunderland have been named among world-leading cities in driving to reduce their climate change impact. Newcastle retains an 'A'-grade status, while Sunderland gains this same rating, from the international climate research provider CDP (an international non-profit organisation who collate and disseminate environmental information). Newcastle has pledged to reach net zero by 2030, with the entire city carbon neutral, whilst Sunderland is seeking to become carbon neutral by 2040. Targets consider a large scope from transport to domestic energy use and waste targets[13].

Waste is a serious issue for all regions of the UK both in the short and long term. Use of waste hierarchy principles, such as reuse and recycle, has improved greatly in recent decades with still much work to be done. Resource use refers to what assets will be built from, considering raw material scarcity, recycling, and embodied carbon. It also refers to where assets will be built factoring in promotion of site reuse where practicable.

Average recycling rates in the North East for 2018/19 were 36.4% which was lower than the average for England of 43.8%[14]. There may be a relationship with population density and space for landfill that could explain some of the difference when compared to other regions which form the national average as the North East is one of the least densely populated areas in the UK. There are 104 permitted waste sites on the Environment Agency records for authorised landfill[15] in the CL. Landfill Sites are becoming more difficult to source nationally, and historically the North East has used many former quarries.

Air quality is varied across the Level 1 with higher concentrations of air pollutants in more urbanised areas, usually from transport or industrial production. Domestic energy use releases air pollution from the generating sources, which are often power stations outside of urban centres for those generation sources that have negative air quality emissions.

Air Quality Management Areas (AQMAs) are declared where the national air quality objectives are not being met and are shown on the accompanying maps. AQMAs are predominately designated for Nitrogen dioxide (NO_2) and Particulate Matter (PM10). There are seven AQMAs in the CL. Two AQMAs are located within the Wear SPA and both have Durham as the local authority. These are the Durham City AQMA and Chester-le-Street AQMA. Five AQMAs intersect the Tyneside SPA, with two in the South Tyneside Metropolitan Borough Council boundary named AQMA 1 and AQMA 2. Two are within Newcastle City Council's boundary and are named as: AQMA 1b (City Centre) and AQMA 5 (Gosforth). The final AQMA is Gateshead Town Centre within the Gateshead Metropolitan Borough Council boundary.

LIKELY FUTURE WITHOUT THE PLAN
The Government's National Infrastructure Strategy (2020) outlines a legal commitment to decarbonise the economy by 2050, strategies to rebuild the economy following the COVID-19 pandemic and plans to 'level-up' UK cities and regional powerhouses. Regeneration and investment are likely to increase the number and quality of material assets including transport infrastructure, recycling facilities, and building efficiency.

[13] BBC News (2021) Grade A Status for Newcastle and Sunderland's Green Plan, available from: Grade 'A' status for Newcastle and Sunderland's green plans - BBC News, accessed May 2022.
[14] Defra (2019) Statistics on waste managed by local authorities in England in 2018/19.
[15] Environment Agency Defra Data Services Platform (2022), accessed March 2022.

Air Quality is expected to improve in the short and medium terms as vehicular transport is electrified, including the ban on the sale of new petrol and diesel cars from 2030. This is despite the increase in population expected.

1.5 Water Resources

In general, rainfall is lower in the east of England compared to the west. The North East is an area of water surplus owing to its population density, climate, and topography. Supply demand status for water resource zones (WRZs) across the region shows that as of 2021, Hartlepool WRZ, Berwick-Fowberry WRZ and Kielder WRZ all are areas of surplus[16]. Further WRZ marginally intersect the Level 1 including North Eden; Carlisle (both United Utilities); and Grid SWZ (Yorkshire Water)[17]. If water usage increases this is likely to place additional pressures on wastewater treatment which can be energy intensive.

The Northumbria River Basin District (RBD) is designated under the Water Framework Directive and covers an area of 9,000km^2, extending from the Scottish border in the north to County Durham in the south and eastern Cumbria in the west to the North Sea in the east[18]. There are 4 management catchments that make up the river basin district, which include interconnected rivers, lakes, groundwater, estuaries, and coastal waters. These range from industrial urban areas in the east to the moors, hills, and valleys of the Pennines in the west. Each RBD features numerous water bodies with assessed status for ecological, biological, and chemical indicators. The Northumbria RBD had 29 water bodies that failed for chemical status and 75 water bodies with either a bad or poor ecological status/ potential, from a total of 374.

Part of NWG's operational area is within the Solway Tweed RBD where approximately 5% of the total Solway Tweed RBD is within the NWG operational area. The Tweed River Operational Catchment is the relevant part of the overall RBD - all watercourses are of good/ high ecological status and are good chemical status by 2015 and 2027[19].

Where watercourses are not achieving good status, the Environment Agency identify the Reasons for Not Achieving Good Status (RNAGS); the reasons can include 'Water Industry Intermittent Discharges', i.e., discharges from storm overflows. This data has been key to identifying the measures required within the plan, and the timescale over which they must be implemented.

LIKELY FUTURE WITHOUT THE PLAN
The anticipated population growth alongside the desires for economic growth will likely increase stress on water availability and the natural environment as well as the total volume of water requiring treatment. The effects are likely to be amplified by climate change. Ecological and chemical status of water bodies may be subject to climate change. Firstly, temperature impacts both the chemical and biological characteristics of surface water, with dissolved oxygen levels changing in the water as one example. Changing rainfall patterns may also lead to a reduction in perennial water bodies and increased intermittent or ephemeral water bodies with associated impacts. The Water Framework Directive set a target of aiming to achieve

[16] Water Resources North (2021) Revised Water Resources Position Statement, available from: wren-report-feb21-final.pdf (waterresourcesnorth.org) , accessed March 2022.
[17] Defra (2022) Spatial Download for WRZ. Available from: Defra Spatial Data Download, accessed March 2022.
[18] Environment Agency (2015) RBMP. Available from: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/718333/Northumbria_RBD_Part_1_river_basin_management_plan.pdf, accessed March 2022.
[19] Environment Agency (2022) Objectives data for Tweed River Operational Catchment. Available from: https://environment.data.gov.uk/catchment-planning/OperationalCatchment/3380/objectives, accessed March 2022.

at least 'good status' in all waterbodies by 2015. However, provided that certain conditions are satisfied, in some cases the achievement of good status may be delayed until 2021 or 2027.

1.6 Flood Risk

Flood risk across the Level 1 is varied and can occur from a wide range of sources including fluvial, coastal, groundwater, reservoir, sewer, and surface water. Climate change is expected to result in more extreme weather events; increased sea levels; and changes to rainfall and temperature which could all impact on the future flood risk.

The NWG area of operation predominantly intersects the Northumbria RBD and smaller parts of the Solway & Tweed RBD. Almost 9,200 properties in the Northumbria RBD receive direct flood warnings[20]. Thousands of residential and non-residential properties in the RBD benefit from river flood risk management schemes, including homes and businesses in Morpeth and Warkworth. Further schemes are ongoing or planned in places such as Blyth, Team Valley, Port Clarence, Stockton, Gosforth, and Guisborough[20].

The Environment Agency and local councils/ Lead Local Flood Authorities (LLFAs) also manage and reduce flood risk through the planning system[20]. There are multiple Environment Agency Main Rivers and some applicable ordinary watercourses within the region which have flood zones with planning guidance on development and the requirements for further study such as Flood Risk Assessments. Flood Risk has been considered through the DWMP as part of the problem characterisation stage and the option appraisal. Northumbrian Water manages flooding from the sewer network and there is an ongoing programme to renew and replace sewers to reduce the risk of sewer flooding to homes through the current AMP period. Development such as paving, extensions, or new housing can all increase flows in the sewer network. Northumbrian Water is working with local councils and the Environment Agency to investigate how to manage this increase of surface water and reduce flood risk from their network.

LIKELY FUTURE WITHOUT THE PLAN
Climate change is likely to result in changing rainfall patterns in terms of volume and intensity. Flood risk can be affected by either factor or in-combination. The Government's 25 year Environment Plan looks to strengthen policy including National Planning Policy Framework (NPPF) guidance in regard to development in flood risk areas. Sustainable solutions are promoted, and these also fit into other policy and plans including NWG's own ambitions.

1.7 Heritage

The options within the DWMP could affect heritage assets, including built heritage and its setting, archaeology, and the historic landscape character, particularly where these are related to the water environment or may be affected by drainage measures. Archaeological remains are sensitive to changes relating to land use, water quality and water levels.

[20] Environment Agency (2016) Northumbria River Basin Summary. Available from: LIT_10200_NORTHUMBRIA_FRMP_SUMMARY_DOCUMENT.pdf (publishing.service.gov.uk), accessed March 2022.

A dominant heritage constraint is the World Heritage Site (WHS) of Hadrian's Wall (full name: the Frontiers of the Roman Empire, Hadrian's Wall)[21]. This WHS intersects west to east across the SPAs of Rural Tyne, Northumberland, and Tyneside. This area acts as both a major tourism pull factor and as one of the UK's prominent historical heritage and archaeological areas. Additionally, 50 records from a search of Scheduled Monuments had 'Hadrian' in their name and more may be within the footprint of the WHS or in proximity. Durham Castle and Cathedral is another WHS within the CL, with both shown on the accompanying maps.

A Scheduled Monument is a nationally important archaeological site or historic building, given protection against unauthorised change. There are 1,452 Scheduled Monuments in the Level 1 and these are shown on the accompanying maps.

There are 13,031 listed buildings within the Level 1 and these are shown on the accompanying maps. Of these, 394 are Grade I listed which is for a building or structure of exceptional interest. Nationally, only 2.5% of listed buildings are Grade I. The remaining 12,637 are Grade II or II* listed. Listing is not a preservation order, preventing change, however it means that listed building consent must be applied for to make any changes to that building which might affect its special interest.

One protected wreck is located along the coastline, and this is Seaton Carew Wreck lying in the intertidal zone at Seaton Carew (1000077). There are six Registered Battlefields within the Level 1 and these are shown on the accompanying maps. Three intersect Northumberland SPA; one intersects Rural Tyne SPA; one intersects Tyneside SPA; and one intersects Wear SPA.

There are 57 Registered Parks & Gardens within the Level 1 and these are shown on the accompanying maps. These sites are a 'material consideration' in the planning process, meaning that planning authorities must consider the impact of any proposed development on the landscapes' special character.

Other historical sites may be undesignated, but locally important, such as castles or museums and these should be investigated on a case-by-case basis in the optioneering phase for future selected options.

LIKELY FUTURE WITHOUT THE PLAN
Some heritage assets have faced and survived significant climatic changes from the past and are likely to demonstrate resilience to climate change impacts. However, other historic assets may be at greater risk from the direct impacts of future climate change, through flooding, sea level change, storms, and other factors[22].

1.8 Landscape

Three National Parks are located within the Level 1 and are shown on the accompanying maps. National parks are areas of relatively undeveloped and scenic landscapes designated by national government. Water companies have a statutory duty to have regard to the protection of national parks in carrying out their functions as water undertaker. Northumberland National Park intersects the greatest area including a large area within the Rural Tyne and Northumberland SPAs. The North York Moors National Park intersects the

[21] Historic England (2022) Available from: Frontiers of the Roman Empire (Hadrian's Wall) - 1000098 | Historic England, accessed March 2022.
[22] English Heritage, [now Historic England] (2010) Climate Change and the Historic Environment, accessed March 2022.

southern boundary of Teesside, and the Yorkshire Dales National Park intersects the southern boundary of Teesdale. Buffers for development or consultation associated with the National Parks often extend beyond their spatial location.

An Area of Outstanding Natural Beauty (AONB) is a designated exceptional landscape whose distinctive character and natural beauty are precious enough to be safeguarded in the national interest. AONB are protected and enhanced for nature, people, business, and culture. Two AONB are located within the Level 1 and these are North Pennines and Northumberland Coast, shown on the accompanying maps. Each national AONB has a Management Plan which describes the area and identifies future trends and opportunities with actions.

The North Pennines AONB is "one of England's most special places – a peaceful, unspoilt landscape with a rich history and vibrant natural beauty featuring tumbling waterfalls, sweeping moorland views, dramatic dales, stone-built villages, and snaking stonewalls" [23]. The North Pennines includes parts of the Pennine Dales Environmentally Sensitive Area.

The Northumberland Coast AONB is a wild coastline which "sweeps along some of Britain's finest beaches and is internationally noted for its wildlife. The AONB, a narrow coastal strip, stretches from Berwick-upon-Tweed to Amble. Open miles of beach are backed in places by extensive sand dunes and the AONB takes in the island of Lindisfarne and its treacherous intertidal flats, as well as the numerous small islands and rocks of the Farne Islands further out from the coast"[24]. Seascapes are an important aspect of the Northumberland landscape, featuring in many of the most significant views within the study area. Northumberland has a long, generally low-lying coastline to the North Sea. The coastline comprises a series of rocky headlands alternating with sandy bays, which are the result of underlying geology.[25]

The Durham Heritage Coast is defined from Sunderland to Hartlepool and thus is given protection through the NPPF and County Durham Plan. The Heritage Coast Management Plan 2018-2025 sets out objectives, including to conserve, protect and enhance the natural beauty of the coast; and to maintain and improve the environmental health of inshore waters affecting the Heritage Coast and its beaches through appropriate works and management.

Natural England has defined a series of National Character Areas (NCA) to conserve nature in England. They are areas of countryside identified by the unique combination of physical attributes, wildlife, land use and culture. Those applicable to the region are presented below in **Table 1.8.1** and are shown on the accompanying maps.

Table 1.8.1 – National Character Areas

Name	Description
North Northumberland Coastal Plain[26]	Varied landscape where coastal dune makes up the highest coverage priority habitat. The expansive coastal landscape and famous wildlife reserves around Lindisfarne and the Farne Islands bring people to this area.

[23] Landscapes for Life (2022) Available from: North Pennines Area of Outstanding Natural Beauty (landscapesforlife.org.uk), accessed May 2022.

[24] Landscapes for Life (2022) Available from: Northumberland Coast Area of Outstanding Natural Beauty (landscapesforlife.org.uk), accessed May 2022.

[25] Northumberland Landscape Character Assessment Part A Landscape Classification (2010) Available from Microsoft Word - Northumberland LCA Part A FINAL.doc, accessed June 2022

[26] Natural England (2014) North Northumberland Coastal Plain, available from: NCA1 N Northumberland Coastal Plain 220115MW.pdf, accessed March 2022.

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Border Moors and Forests[27]	The high altitude and climatic conditions led to peat deposits and the formation of a large expanse of upland mire habitats, much of which is internationally designated as Special Area of Conservation. The extent of these habitats has been reduced by widespread conifer afforestation, particularly at Kielder Forest which occupies the slopes around Kielder Water, a large, winding reservoir at the head of the North Tyne Valley which also forms a prominent feature in the landscape.
Cheviots[28]	The wild, open upland landscape is dominated by rolling moorlands; there are extensive mosaics of heath, blanket bog, and grassland, managed for sheep and cattle rearing and grouse moors.
Cheviot Fringe[29]	Vales to the south are a patchwork of arable farmland, pasture, and meadows with the regular field pattern strong, delineated by hedgerows punctuated with trees. To the north, arable cultivation dominates, and the fields are flatter and larger with fewer hedgerows. Conifer blocks and shelterbelts are prominent in the landscape with broadleaved woodland predominantly along watercourses.
South East Northumberland Coastal Plain[30]	The coast supports a wide diversity of habitats including sand dunes, maritime cliffs, and slopes, coastal and flood plain grazing marsh and mudflats. Parts of the coast are of European importance for the bird populations (roseate and Arctic tern, purple sandpiper, and turnstone) at Druridge Bay and Coquet Island, which are included in the Northumbria Coast Special Protection Area, and for its dune systems and their plant communities, which are part of the North Northumberland Dunes Special Area of Conservation. The area supports a diverse range of marine species and ecosystems. The rivers Blyth, Wansbeck, Coquet, Pont and Seaton Burn drain through the coastal plain from the uplands and support rich wildlife, including white-clawed crayfish, otter, water vole and salmonids.
Northumberland Sandstone Hills[31]	The ridgetops and upper slopes are covered with heather and grass moorland broken by large geometric blocks of conifer. Below this is pasture with some arable cultivation, broadleaved woodland on scarp slopes and along watercourses, and a few notable parklands. There is a long tradition of rearing hardy sheep and cattle in this area
Mid Northumberland[32]	The area is dissected by several small rivers which flow eastwards to the sea. The River Coquet flows down from the Cheviots, while the rivers Font, Wansbeck and Blyth and their tributaries wind down from the sandstone hills and upland pastures through wooded valleys and lowland arable areas. Within this predominantly farmed landscape there are many small woodland and shelterbelts, and a few open water areas.
Durham Coalfield Pennine Fringe[33]	204 hectares fall within the North Pennine Moors SAC and Special Protection Area, designated for its habitats (including dry heath, blanket bog, and old sessile oak woodland) and upland breeding birds (including golden plover, curlew, dunlin, hen harrier and merlin). The west is more upland in character, with large, open fields bounded by drystone walls/ fences, and is primarily used for grazing.
Tyne Gap and Hadrian's Wall[34]	A mosaic of arable and pastureland, conifer plantations and well-wooded valley sides occur, along with the fertile lowland corridor of the river flood plain. A well-wooded mosaic of deciduous, mixed, and coniferous woodland provides habitat for priority species – red squirrel and woodland birds. Broadleaved woodland on steep slopes line the rivers.
Tyne and Wear Lowlands[35]	An area of gently undulating land, incised by the valleys of the major rivers. It is densely populated and heavily influenced by urban settlement, industry, and infrastructure. Between settlements there are wide stretches of agricultural land.

[27] Natural England (2013) Border Moors and Forests, available from: http://publications.naturalengland.org.uk/publication/4723311363751936?category=587130, accessed March 2022.
[28] Natural England (2013) Cheviot, available from: http://publications.naturalengland.org.uk/publication/4820746454958080, accessed March 2022.
[29] Natural England (2013) Cheviot Fringe, available from: http://publications.naturalengland.org.uk/publication/8760678, accessed March 2022.
[30] Natural England (2013), South East Northumberland Coastal Plain, available from: 13 south east northumberland coastal plain.pdf, accessed March 2022.
[31] Natural England (2013), Northumberland Sandstone Hills, available from: H-2-NCA2-Northumberland-Sandstone-Hills.pdf, accessed March 2022.
[32] Natural England (2013), Mid Northumberland, available from: http://publications.naturalengland.org.uk/publication/4839052410880000?category=587130, accessed March 2022.
[33] Natural England (2013), Durham Coalfield Pennine Fringe , available from: NCA Profile: 16. Durham Coalfield Pennine Fringe - NE458 (naturalengland.org.uk), accessed March 2022.
[34] Natural England (2013), Tyne Gap and Hadrian's Wall, available from: NCA Profile: 11 Tyne Gap and Hadrian's Wall - NE533 (naturalengland.org.uk), accessed March 2022.
[35] Natural England (2013), Tyne and Wear Lowlands, available from: NCA Profile: 14 Tyne and Wear Lowlands - NE483 (naturalengland.org.uk), accessed March 2022.

Durham Magnesium Limestone Plateau[36]	Rural land cover consists of arable land and grazing pasture, with small, isolated areas of wildlife-rich habitat such as Magnesian Limestone grassland and ancient woodland in the narrow valleys (or denes) running down to the coast. The coast is an important breeding and feeding area for migratory birds, and harbour porpoise frequents inshore waters.
Tees Lowlands[37]	The mosaic of intertidal and wetland habitats within the Tees Estuary are internationally designated as Teesmouth and Cleveland Coast Special Protection Area and Ramsar site, due to their importance for waterfowl.
North Pennines[38]	Expansive moorlands, grasslands and meadows are important features and upland bogs and acid grassland cover much of the area. The area attracts large numbers of insects, waders, and birds of prey.
Pennine Dales Fringe[39]	Rolling landscapes where the Pennines and Yorkshire Dales transition. Broadleaved woodlands (many of them of ancient origin), coniferous and mixed plantations, and numerous small woods and hedgerow trees all contribute to the well-wooded character of the area.
Yorkshire Dales[40]	An undulating upland landscape with peatland and moorland common. Geologically important landforms are present with many from glacial periods. There are numerous habitats of importance and over two thirds are within National Park land.
North York Moors and Cleveland Hills[41]	Large open heather moorlands which support many protected species. Some 85 per cent of the area falls within the North York Moors National Park
Vale of Mowbray[42]	Drained by the River Swale and its tributaries the River Wiske and the Cod Beck, meandering through flood plains with remnant rough-grazed riverine meadows of high ecological value in the north of the vale. Woodland and tree cover is sparse: small game coverts and parkland landscapes contribute locally to the tree cover,

Landscape Character Assessments[43] identify that moorland drainage or 'gripping' has been extensive in some areas such as the North Pennines, causing damage to blanket bog, erosion of peat and in some cases conversion of bog to acid grassland or heath. This reduces the water retention capacity of the peat, increasing the rate of water flow downstream. The associated drying and decomposition of bog emits carbon dioxide; erosion causes discolouration of water supplies. Similarly, wet grassland has declined as a result of field- and larger-scale drainage. Drainage is identified as a force for change in several of the Landscape Character Types (LCT) and provide landscape management guidelines relevant to drainage across parts of the study area, including:

- LCT 8 Outcrop Hills and Escarpments: restore damaged bogs and flushes by blocking grips and drains
- LCT 19 Moorland and Forest Mosaic: Discourage the drainage of moorland areas and the improvement of in-bye pastures. Encourage restoration of bogs and heather moorland by blocking drains and reducing grazing and stocking levels
- LCT21 Rolling Uplands: Conserve areas of blanket bog through the avoidance of drainage and physical damage. Restore damaged bogs and flushes by blocking

[36] Natural England (2013), Durham Magnesian Limestone Plateau, available from: NCA Profile: 15: Durham Magnesian Limestone Plateau - NE435 (naturalengland.org.uk), accessed March 2022.
[37] Natural England (2013), Tees Lowlands, available from: NCA Profile: 23 Tees Lowlands - NE439 (naturalengland.org.uk), accessed March 2022.
[38] Natural England (2013), North Pennines, available from: http://publications.naturalengland.org.uk/publication/5682293?category=587130, accessed March 2022.
[39] Natural England (2013), Pennine Dales Fringe, available from: NCA Profile: 22 Pennine Dales Fringe - NE474 (naturalengland.org.uk), accessed March 2022.
[40] Natural England (2013), Yorkshire Dales, available from: NCA Profile: 21. Yorkshire Dales - NE399 (naturalengland.org.uk), accessed March 2022.
[41] Natural England (2012), North York Moors and Cleveland Hills, available from: NCA Profile: 25 North York Moors and Cleveland Hills - NE352 (naturalengland.org.uk), accessed March 2022.
[42] Natural England (2013), Vale of Mowbray, available from: http://publications.naturalengland.org.uk/publication/9856012, accessed March 2022.
[43] Northumberland Landscape Character Area Assessment, available from: Northumberland County Council - Studies and evidence reports, accessed June 2022 and The County Durham Landscape Strategy, available from: County Durham Plan Evidence Library - Keystone (objective.co.uk), accessed June 2022

drains. Protect historical features from inappropriate land management including drainage, woodland planting and arable cropping.

- LCT 25 Moorland Ridges: Conserve areas of blanket bog through the avoidance of gripping and physical damage. Restore damaged bogs and flushes by blocking grips and drains.
- LCT 26 Upland Farming and Plantations: Seek opportunities to revert arable back to pasture where soil conditions are poor and restore wet pastures through blocking drains.
- LCT 27 Upper Dale: The maintenance and enhancement of in-bye pastures and allotment grazing should encourage limited use of herbicides, fertilisers and liming and by ensuring appropriate stocking levels and avoiding drainage, ploughing or reseeding.
- LCT 43 Coalfield Upland Fringe: Seek to maintain and enhance semi-improved pastures and meadows, wet pastures and rough grazing areas by adopting appropriate stocking levels or cutting regimes and avoiding improvements such as drainage, ploughing and reseeding.
- Support for the blocking of moorland drainage grips, such as within the North Pennines AONB.
- Support for the restoration and creation of field ponds as part of a 'whole landscape' approach.
- Support for the restoration of natural hydrological conditions to wetland systems and particularly river floodplains, lowland mires and lowland carrs.
- Support for the conservation and restoration of wet grasslands.

Townscape refers to the characteristics of urban areas and this can include the layout, density, and mix of buildings, architecture, and cultural spaces. There is significant industrial heritage across the region, especially along the coast and along major rivers such as the River Tyne and River Wear. Durham City Centre is one example of a location where the townscape will constrain options where architecture and frequent narrow, cobbled streets are present. Areas of important townscape are often located within Conservation Areas. Conservation areas exist to manage and protect the special architectural and historic interest of a place that make it unique. Every local authority in England has at least one conservation area, and there are 283 within the CL.

LIKELY FUTURE WITHOUT THE PLAN
Planning legislation recognises diversity of landscape character and promotes the protection of high value areas and reducing urban sprawl through Green Belts. The NPPF gives protection to the landscapes of greatest value such as National Parks and AONB. Climate change has the potential to impact high value landscapes through changing patterns of rainfall or sea level rise. Climate change can also impact species and habitats that can often play vital roles in helping shape, or bring value, to the highest value, protected landscapes.

1.9 Climate Change Resilience

Current scientific data indicates that the UK is continuing to warm because of anthropogenic causes. The year 2020 was the third warmest year for the UK in a series dating back to 1884. The most recent decade (2011–2020) has been on average 0.5°C warmer than the period from 1981–2010; and 1.1°C warmer than the period between 1961–1990. Additional to temperature change, climate change also affects rainfall which continues to change from both an average rainfall perspective and storm events. The most recent decade (2011–2020) has been on average 9% wetter than 1961–1990 for the UK.

Appendix C – Baseline Environment Review

The Met Office UK Climate Projections (UKCP) were updated in December 2018 (UKCP18)[44]. The Met Office climate projections cover different levels of global warming and when, or if, these levels are reached will depend on the concentration of greenhouse gases entering the global atmosphere. Data is measured in 7.5-mile-square grids across the UK and results can be searched via a postcode to find the grid closest[45]. Newcastle City Council Civic Centre in Central Newcastle was selected at random for a regional representation of results with the postcode NE1 8QH used. Selected results included:

- The hottest day in the last 30 years was 30.6°C which could rise to 31.9°C if global temperatures rise by 2°C, and 36.2°C if global temperatures rise by 4°C.
- In the past 30 summers, there was one day above 25°C per month on average. With a 2°C rise, there could be two days rising to seven days for a 4°C rise.
- In the past 30 years, there were 10 rainy days on average per month in summer. If global average temperatures rise by 2°C, this could be 9 days per month and with a 4°C rise it could be 8 days.
- On the wettest summer day of the past 30 years, 48mm of rain fell. At a 2°C rise, this could be about 64mm, and at a 4°C rise this could be about 61mm, which is 26% more than now.

LIKELY FUTURE WITHOUT THE PLAN
Government policy and international goals indicate significant cuts in greenhouse gas emissions will start to take place throughout the 2020s as progress is made towards net zero targets in 2040/2050. It is anticipated that there will be a lag between the cut in emissions and a slowdown in the rate of temperature increase, i.e., if the world became carbon neutral tomorrow, the climate would continue to change for a period of time, anticipated to be years/ decades.

[44] Met Office (2018) UKCP18. Available from: UK Climate Projections (UKCP) - Met Office accessed April 2022.
[45] BBC News (2021) What will climate change look like near me? Available from: https://www.bbc.co.uk/news/resources/idt-d6338d9f-8789-4bc2-b6d7-3691c0e7d138, accessed April 2022.

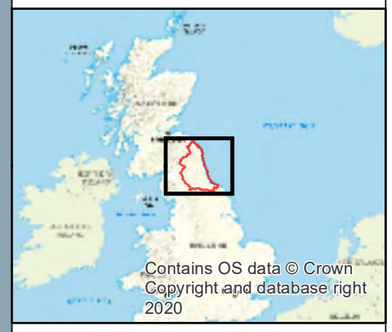
This Plan should be read in conjunction with the associated DWMP Environmental Report. No unauthorised use is allowed.

DO NOT SCALE

Stantec

Legend

- L1 Company Level
- L2 Strategic Planning Areas
- L3 Tactical Planning Units



0 12.5 25 KM

Ver	Description	Chkd	Appd	Date
01	First Issue	GS	SM	14/01/2022

NORTHUMBRIAN WATER living water

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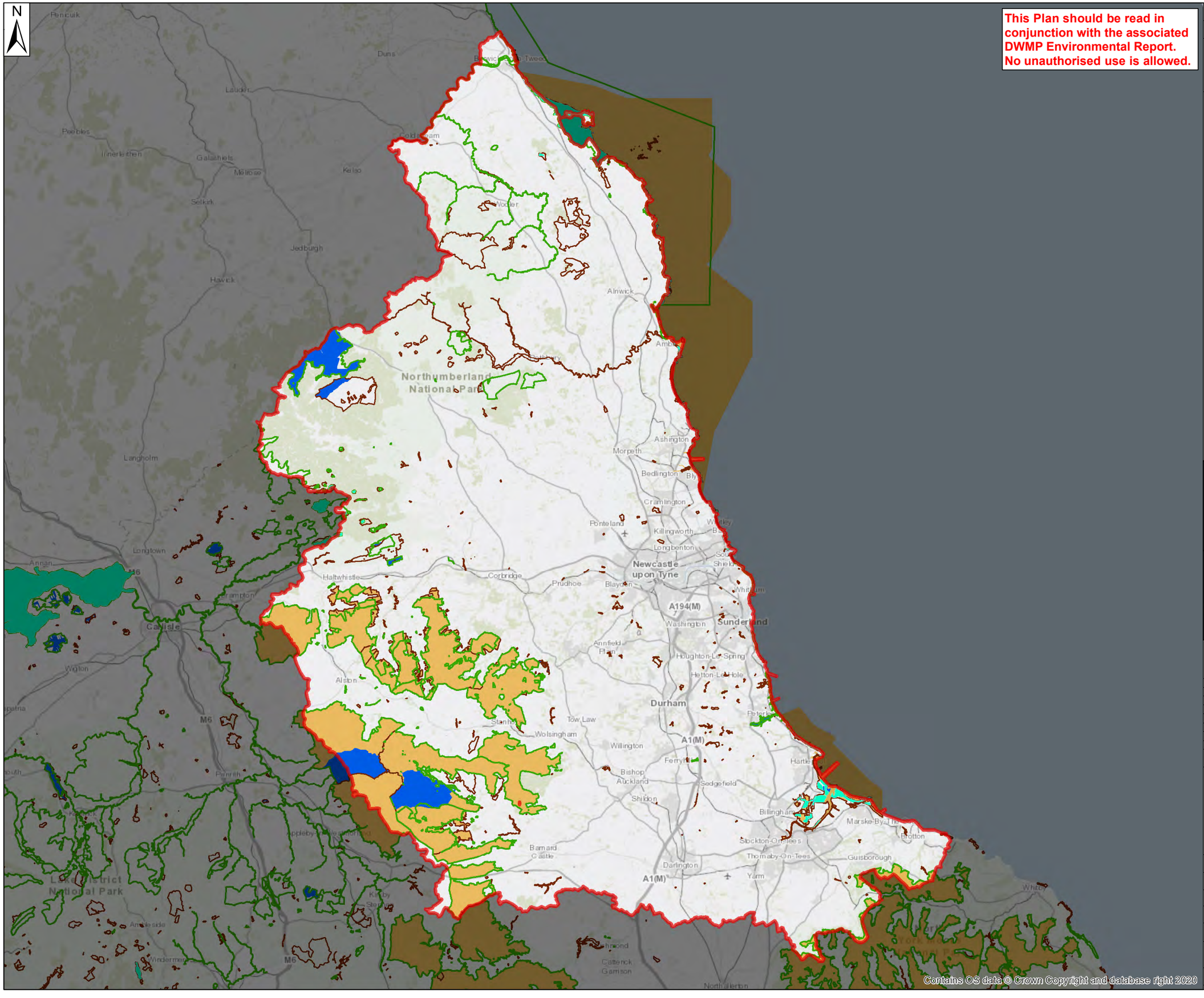
Location: NORTH EAST ENGLAND			
Project Name: NWG DWMP - SEA REPORT			
Contract Name: NORTHUMBRIAN WATER GROUP			
Drawing Title: DWMP LOCATION			
Drawing Number: NWG_SEA_SCOPING_MAP1		Page 1	



DO NOT SCALE

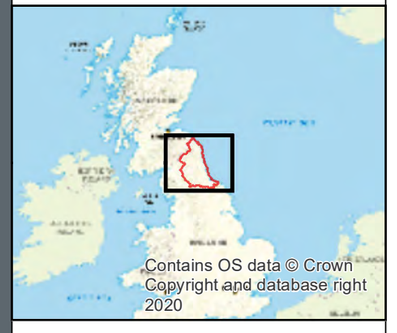
Stantec

Legend

- L1 Company Level

Designations

- Ramsar
- Special Areas of Conservation (SAC)
- Special Protection Areas (SPA)
- Site of Special Scientific Interest (SSSI)
- National Nature Reserve (NNR)



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Ver	Description	Chkd	Appd	Date
01	First Issue	GS	SM	14/01/2022

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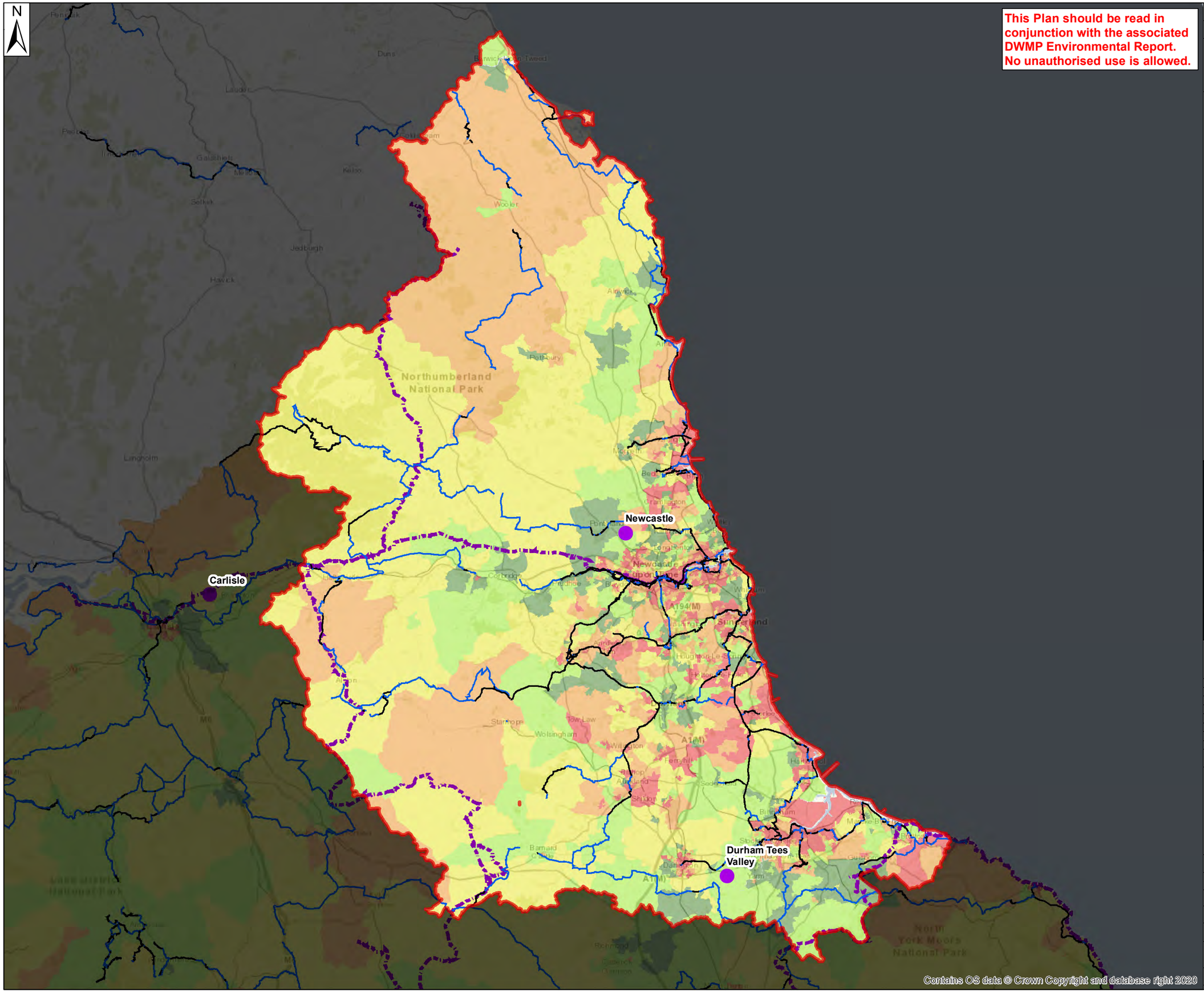
Location: NORTH EAST ENGLAND			
Project Name: NWG DWMP - SEA REPORT			
Contract Name: NORTHUMBRIAN WATER GROUP			
Drawing Title: BASELINE - BIODIVERSITY			
Drawing Number: NWG_SEA_SCOPING_MAP2		Page 2	



DO NOT SCALE

Stantec

Legend

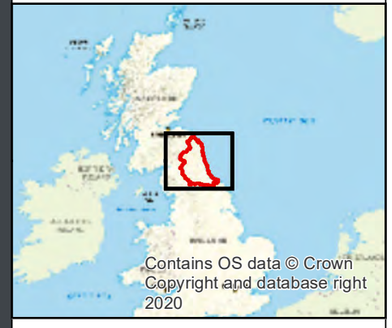
- L1 Company Level
- UK Airports
- National Trail

National Cycle Network Public

- Traffic Free
- On Road

Indices of Multiple Deprivation (IMD) Deciles

- 1 - 2 More Deprived
- 3 - 4
- 5 - 6
- 7 - 8
- 9 - 10 Less Deprived



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Ver	Description	Chkd	Appd	Date
01	First Issue	GS	SM	14/01/2022

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Location: NORTH EAST ENGLAND			
Project Name: NWG DWMP - SEA REPORT			
Contract Name: NORTHUMBRIAN WATER GROUP			
Drawing Title: BASELINE - HUMAN HEALTH & SOCIO-ECONOMIC			
Drawing Number: NWG_SEA_SCOPING_MAP3		Page 3	

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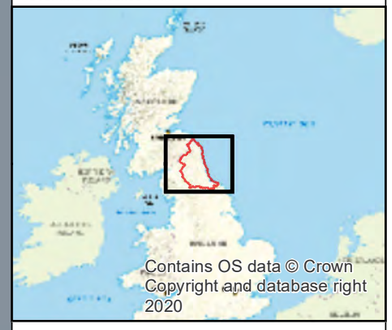
DO NOT SCALE

Stantec

Legend

- L1 Company Level
- Greenbelt (2019-20)
- Permitted Waste Sites
- Air Quality Management Area (AQMA)



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Ver	Description	Chkd	Appd	Date
01	First Issue	GS	SM	14/01/2022

NORTHUMBRIAN WATER living water

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331001729	N/A

Location: NORTH EAST ENGLAND

Project Name: NWG DWMP - SEA REPORT

Contract Name: NORTHUMBRIAN WATER GROUP

Drawing Title: BASELINE - MATERIAL ASSETS

Drawing Number: NWG_SEA_SCOPING_MAP4

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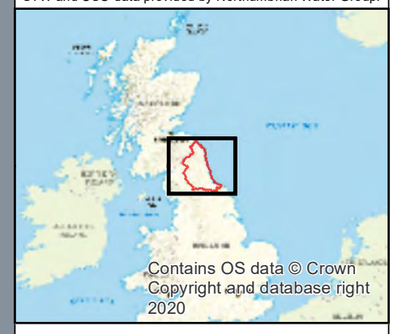
DO NOT SCALE

Stantec

Legend

- L1 Company Level
- Water Resource Zones
- EA Statutory Main River
- NWG Exisitng STW (Sewage Treatment Works)
- NWG Existing CSO (Combined Sewer Overflow)
- Flood Zone 3 - High Risk
- Flood Zone 2 - Medium Risk



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01	First Issue	GS	SM	14/01/2022

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Project Group:	Sub Process:
331001729	N/A

Location: NORTH EAST ENGLAND

Project Name: NWG DWMP - SEA REPORT

Contract Name: NORTHUMBRIAN WATER GROUP

Drawing Title: BASELINE - WATER

Drawing Number: NWG_SEA_SCOPING_MAP5

N

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DO NOT SCALE

Stantec

Legend

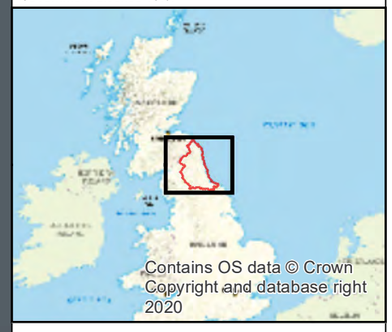
- L1 Company Level

Source Protection Zones (England)

- Zone I - Inner Protection Zone
- Zone II - Outer Protection Zone
- Zone III - Total Catchment

Agricultural Land Classification

- Grade 2
- Grade 3
- Grade 4
- Grade 5
- Non Agricultural
- Urban



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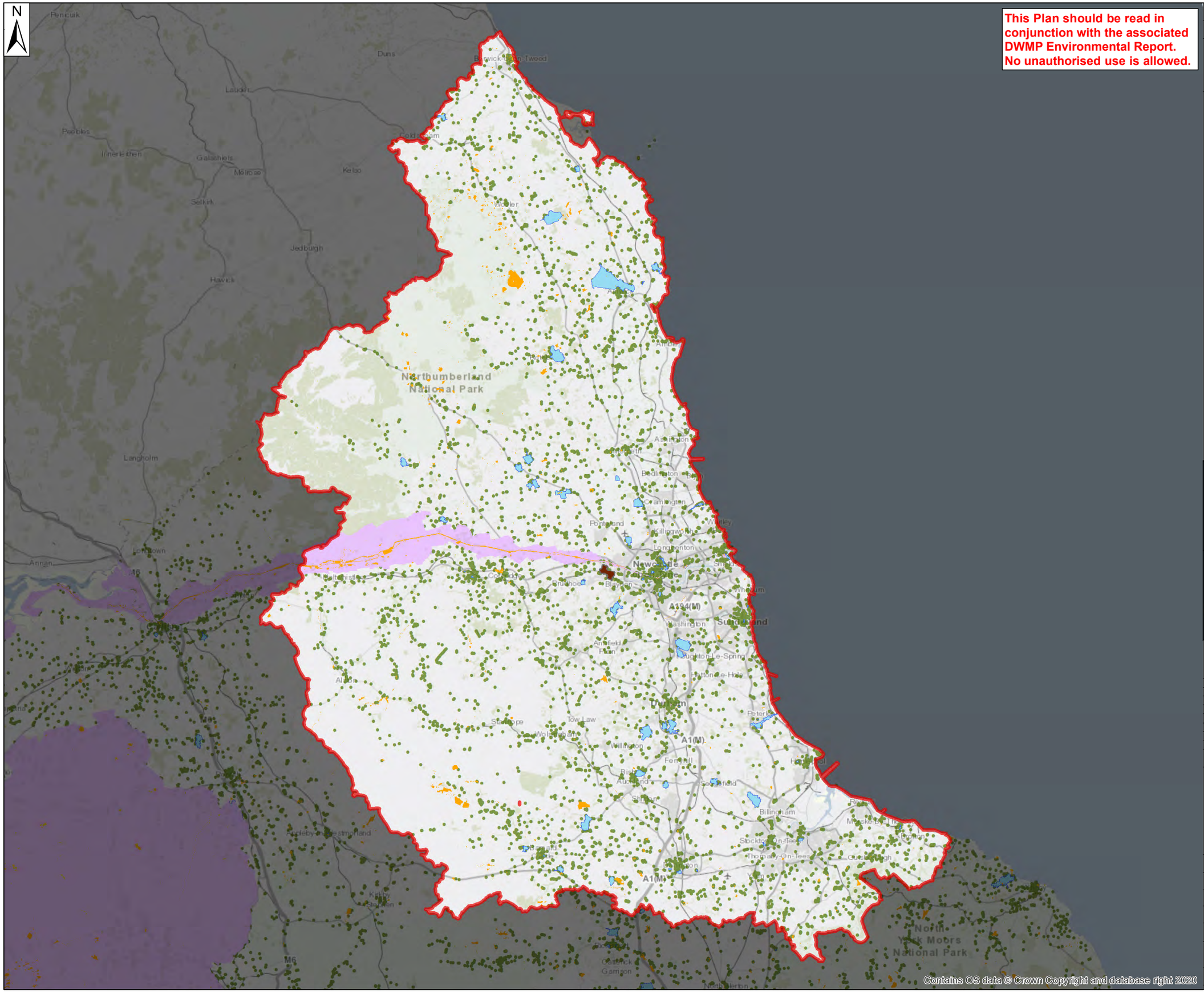
Location: NORTH EAST ENGLAND			
Project Name: NWG DWMP - SEA REPORT			
Contract Name: NORTHUMBRIAN WATER GROUP			
Drawing Title: BASELINE - GEODIVERSITY			
Drawing Number: NWG_SEA_SCOPING_MAP6		Page 6	



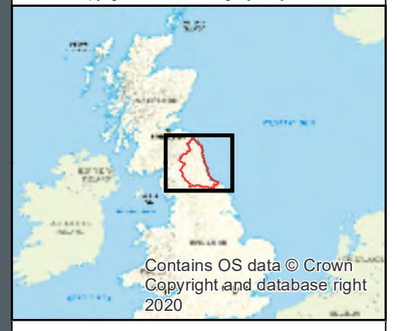
This Plan should be read in conjunction with the associated DWMP Environmental Report. No unauthorised use is allowed.

DO NOT SCALE

Stantec

Legend

- L1 Company Level
- World Heritage Site (WHS)
- Scheduled Monument
- Registered Battlefield
- Registered Parks and Gardens
- Listed Building



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Ver	Description	Chkd	Appd	Date
01	First Issue	GS	SM	14/01/2022

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Project Group: 331001729		Sub Process: N/A	

Location: NORTH EAST ENGLAND

Project Name: NWG DWMP - SEA REPORT

Contract Name: NORTHUMBRIAN WATER GROUP

Drawing Title: BASELINE - HERITAGE

Drawing Number: NWG_SEA_SCOPING_MAP7

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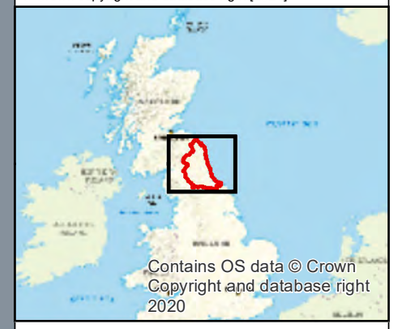
DO NOT SCALE

Stantec

Legend

- L1 Company Level
- National Parks
- Conservation Area
- National Character
- Areas of Outstanding Natural Beauty (AONB)



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Project Name: NWG DWMP - SEA REPORT			
Contract Name: NORTHUMBRIAN WATER GROUP			
Drawing Title: BASELINE - LANDSCAPE			
Drawing Number: NWG_SEA_SCOPING_MAP8		Page 8	

APPENDIX D: LEVEL 2 SEA ASSESSMENT MATRICES

Appendix D – Level 2 SEA Assessment Matrices

Key:

Major positive	+ + +	Moderate positive	+ +	Minor positive	+	Neutral	0	Minor negative	-	Moderate negative	- -	Major negative	- - -	No relationship	

HU =	Heritage Urban	IU =	Industry/Economic Urban	CU =	Coastal Urban	LR =	Lowlands Rural	UR =	Uplands Rural	SF =	Suburban Fringe

Level 2 = Northumberland

		Protect, conserve, and enhance Biodiversity/ Geodiversity & geodiversity, including soils	Protect, conserve, and enhance Human Health and well-being, including resilient communities	Protect, conserve, and enhance social and economic prosperity	Manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation	Protect, conserve, and enhance water resources	Reduce and manage flood risk, increasing flood resilience	Protect, conserve, and enhance the historic environment, including archaeology	Conserve, protect and enhance the landscape, townscape, and visual amenity	Adapt, and improve resilience to climate change
	Options	**Biodiversity/ Geodiversity**	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
HU	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	- -		+ +
	Below ground storage	-	0	0	-	+	+	- -		+
	Sewer upsizing	-	0	0	- -	+	-	- -		+
	Flow transfer	-	0	0	- -	+	-	- - -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	- - -	- - -	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

IU	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+ +	+ +	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ + +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+ +	+ +	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+ +	+ +	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

CU	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
LR	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
UR	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+

Appendix D – Level 2 SEA Assessment Matrices

	CSO rationalisation	0	0		0	+	-			0
SF	**Options**	**Biodiversity/ Geodiversity**	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
	Not Applicable									

Appendix D – Level 2 SEA Assessment Matrices

Level 2 = Rural Tyne

HU		Protect, conserve, and enhance Biodiversity/ Geodiversity & geodiversity, including soils	Protect, conserve, and enhance Human Health and well-being, including resilient communities	Protect, conserve, and enhance social and economic prosperity	Manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation	Protect, conserve, and enhance water resources	Reduce and manage flood risk, increasing flood resilience	Protect, conserve, and enhance the historic environment, including archaeology	Conserve, protect and enhance the landscape, townscape, and visual amenity	Adapt, and improve resilience to climate change
	Options	**Biodiversity/ Geodiversity**	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	- - -		+ +
	Below ground storage	-	0	0	-	+	+	- - -		+
	Sewer upsizing	-	0	0	- -	+	-	- - -		+
	Flow transfer	-	0	0	- -	+	-	- - -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	- - -	- - -	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

IU

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
Smart networks				+	+	+			+
Working in partnership	+	+ +	+ +	+	+	+	+	+	+
Blue/ green corridors	+ +	+ + +	+ +	+ +	+ +	+ +	0	+ +	+ +
SuDS features	+	+ +	+ +	+	+	+	0	+	+ +
Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
Below ground storage	-	0	0	-	+	+	-		+
Sewer upsizing	-	0	0	- -	+	-	-		+
Flow transfer	-	0	0	- -	+	-	- -		0
STW rationalisation	0	+ +	+ +	+	+ +	+	0	0	-
STW upgrade	-	-	0	-	+	-	-	-	+
CSO rationalisation	0	0		0	+	-			0

CU

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Not Applicable									

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
LR	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
UR	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
SF	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

Level 2 = Tyneside

HU		Protect, conserve, and enhance Biodiversity/ Geodiversity & geodiversity, including soils	Protect, conserve, and enhance Human Health and well-being, including resilient communities	Protect, conserve, and enhance social and economic prosperity	Manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation	Protect, conserve, and enhance water resources	Reduce and manage flood risk, increasing flood resilience	Protect, conserve, and enhance the historic environment, including archaeology	Conserve, protect and enhance the landscape, townscape, and visual amenity	Adapt, and improve resilience to climate change
	Options	**Biodiversity/ Geodiversity**	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	- - -		+ +
	Below ground storage	-	0	0	-	+	+	- - -		+
	Sewer upsizing	-	0	0	- -	+	-	- - -		+
	Flow transfer	-	0	0	- -	+	-	- - -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	- - -	- - -	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

IU	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+ +	+ +	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ + +	+ +	+ +	+ +	+ +	0	+ +	+ + +
	SuDS features	+	+ +	+ +	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+ +	+ +	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

CU	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
LR	Not Applicable									

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
UR	Not Applicable									

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
SF	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

Level 2 = Wear

HU		Protect, conserve, and enhance Biodiversity/ Geodiversity & geodiversity, including soils	Protect, conserve, and enhance Human Health and well-being, including resilient communities	Protect, conserve, and enhance social and economic prosperity	Manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation	Protect, conserve, and enhance water resources	Reduce and manage flood risk, increasing flood resilience	Protect, conserve, and enhance the historic environment, including archaeology	Conserve, protect and enhance the landscape, townscape, and visual amenity	Adapt, and improve resilience to climate change
	Options	**Biodiversity/ Geodiversity**	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	- - -		+ +
	Below ground storage	-	0	0	-	+	+	- - -		+
	Sewer upsizing	-	0	0	- -	+	-	- - -		+
	Flow transfer	-	0	0	- -	+	-	- - -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	- - -	- - -	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

IU

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
Smart networks				+	+	+			+
Working in partnership	+	+ +	+ +	+	+	+	+	+	+
Blue/ green corridors	+ +	+ + +	+ +	+ +	+ +	+ +	0	+ +	+ + +
SuDS features	+	+ +	+ +	+	+	+	0	+	+ +
Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
Below ground storage	-	0	0	-	+	+	-		+
Sewer upsizing	-	0	0	- -	+	-	-		+
Flow transfer	-	0	0	- -	+	-	- -		0
STW rationalisation	0	+ +	+ +	+	+ +	+	0	0	-
STW upgrade	-	-	0	-	+	-	-	-	+
CSO rationalisation	0	0		0	+	-			0

CU

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Not Applicable									

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
LR	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
UR	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
SF	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

Level 2 = Wearside

		Protect, conserve, and enhance Biodiversity/ Geodiversity & geodiversity, including soils	Protect, conserve, and enhance Human Health and well-being, including resilient communities	Protect, conserve, and enhance social and economic prosperity	Manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation	Protect, conserve, and enhance water resources	Reduce and manage flood risk, increasing flood resilience	Protect, conserve, and enhance the historic environment, including archaeology	Conserve, protect and enhance the landscape, townscape, and visual amenity	Adapt, and improve resilience to climate change
HU	**Options**	**Biodiversity/ Geodiversity**	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	- -		+ +
	Below ground storage	-	0	0	-	+	+	- -		+
	Sewer upsizing	-	0	0	- -	+	-	- -		+
	Flow transfer	-	0	0	- -	+	-	- - -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	- - -	- - -	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

IU	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+ +	+ +	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ + +	+ +	+ +	+ +	+ +	0	+ +	+ + +
	SuDS features	+	+ +	+ +	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+ +	+ +	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

CU	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

LR

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
Smart networks				+	+	+			+
Working in partnership	+	+	+	+	+	+	+	+	+
Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
SuDS features	+	+	+	+	+	+	0	+	+ +
Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
Below ground storage	-	0	0	-	+	+	-		+
Sewer upsizing	-	0	0	- -	+	-	-		+
Flow transfer	-	0	0	- -	+	-	- -		0
STW rationalisation	0	+	+	+	+ +	+	0	0	-
STW upgrade	-	-	0	-	+	-	-	-	+
CSO rationalisation	0	0		0	+	-			0

UR

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience

Not Applicable

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
SF	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

Level 2 = Teesdale

HU		Protect, conserve, and enhance Biodiversity/ Geodiversity & geodiversity, including soils	Protect, conserve, and enhance Human Health and well-being, including resilient communities	Protect, conserve, and enhance social and economic prosperity	Manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation	Protect, conserve, and enhance water resources	Reduce and manage flood risk, increasing flood resilience	Protect, conserve, and enhance the historic environment, including archaeology	Conserve, protect and enhance the landscape, townscape, and visual amenity	Adapt, and improve resilience to climate change
	Options	**Biodiversity/ Geodiversity**	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	- -		+ +
	Below ground storage	-	0	0	-	+	+	- -		+
	Sewer upsizing	-	0	0	- -	+	-	- -		+
	Flow transfer	-	0	0	- -	+	-	- - -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	- - -	- - -	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

IU

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
Smart networks				+	+	+			+
Working in partnership	+	+ +	+ +	+	+	+	+	+	+
Blue/ green corridors	+ +	+ + +	+ +	+ +	+ +	+ +	0	+ +	+ +
SuDS features	+	+ +	+ +	+	+	+	0	+	+ +
Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
Below ground storage	-	0	0	-	+	+	-		+
Sewer upsizing	-	0	0	- -	+	-	-		+
Flow transfer	-	0	0	- -	+	-	- -		0
STW rationalisation	0	+ +	+ +	+	+ +	+	0	0	-
STW upgrade	-	-	0	-	+	-	-	-	+
CSO rationalisation	0	0		0	+	-			0

CU

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience

Not Applicable

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
LR	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
UR	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
SF	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

Level 2 = Teesside

HU		Protect, conserve, and enhance Biodiversity/ Geodiversity & geodiversity, including soils	Protect, conserve, and enhance Human Health and well-being, including resilient communities	Protect, conserve, and enhance social and economic prosperity	Manage and improve efficient use of resources, inc. carbon, emissions to air & waste generation	Protect, conserve, and enhance water resources	Reduce and manage flood risk, increasing flood resilience	Protect, conserve, and enhance the historic environment, including archaeology	Conserve, protect and enhance the landscape, townscape, and visual amenity	Adapt, and improve resilience to climate change
	Options	**Biodiversity/ Geodiversity**	**Human Health**	**Socio-Economic**	**Carbon & Material Assets**	**Water**	**Flood Risk**	**Heritage**	**Landscape**	**Climate Change Resilience**
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	- -		+ +
	Below ground storage	-	0	0	-	+	+	- -		+
	Sewer upsizing	-	0	0	- -	+	-	- -		+
	Flow transfer	-	0	0	- -	+	-	- - -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	- - -	- - -	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

IU

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
Smart networks				+	+	+			+
Working in partnership	+	+ +	+ +	+	+	+	+	+	+
Blue/ green corridors	+ +	+ + +	+ +	+ +	+ +	+ +	0	+ +	+ + +
SuDS features	+	+ +	+ +	+	+	+	0	+	+ +
Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
Below ground storage	-	0	0	-	+	+	-		+
Sewer upsizing	-	0	0	- -	+	-	-		+
Flow transfer	-	0	0	- -	+	-	- -		0
STW rationalisation	0	+ +	+ +	+	+ +	+	0	0	-
STW upgrade	-	-	0	-	+	-	-	-	+
CSO rationalisation	0	0		0	+	-			0

CU

Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
Smart networks				+	+	+			+
Working in partnership	+	+	+	+	+	+	+	+	+
Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+ +
SuDS features	+	+	+	+	+	+	0	+	+ +
Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
Below ground storage	-	0	0	-	+	+	-		+
Sewer upsizing	-	0	0	- -	+	-	-		+
Flow transfer	-	0	0	- -	+	-	- -		0
STW rationalisation	0	+	+	+	+ +	+	0	0	-
STW upgrade	-	-	0	-	+	-	-	-	+
CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

LR	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

UR	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

Appendix D – Level 2 SEA Assessment Matrices

	Options	Biodiversity/ Geodiversity	Human Health	Socio-Economic	Carbon & Material Assets	Water	Flood Risk	Heritage	Landscape	Climate Change Resilience
SF	Influence customer behaviour	+	0	+	+ +	+ +	+			+ +
	Catchment management	+ +	0	-	+ +	+ +	+ +		+ +	+ +
	Smart networks				+	+	+			+
	Working in partnership	+	+	+	+	+	+	+	+	+
	Blue/ green corridors	+ +	+ +	+ +	+ +	+ +	+ +	0	+ +	+
	SuDS features	+	+	+	+	+	+	0	+	+ +
	Surface water separation/ removal	-	0	0	- -	+ +	-	-		+ +
	Below ground storage	-	0	0	-	+	+	-		+
	Sewer upsizing	-	0	0	- -	+	-	-		+
	Flow transfer	-	0	0	- -	+	-	- -		0
	STW rationalisation	0	+	+	+	+ +	+	0	0	-
	STW upgrade	-	-	0	-	+	-	-	-	+
	CSO rationalisation	0	0		0	+	-			0

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DRAFT DRAINAGE & WASTEWATER MANAGEMENT PLAN (DWMP) 331001729-01-02

Habitat Regulation Assessment: Stage 1 Screening

June 2022

Client: **Northumbrian Water Group**

Project: **DWMP HRA**

Document Title: **Habitat Regulation Assessment: Stage 1 Screening**

Esh-Stantec Project Code: 331001729			Document No: 331001729-01-02		
Version	**Date**	**Description/Amendment**	**Prepared by (Author)**	**Checked by**	**Reviewed by**
01	June 2022	Draft HRA Report	*ZM*	*RO*	*CO*

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Table of Contents

Executive Summary

This report details the screening process of a Habitats Regulations Assessment for 249 catchments that are part of Northumbrian Water's Drainage and Waste Management Plan (DWMP). The screening has been carried out for two planned options as part of the DWMP, below ground concrete storage tanks and a hybrid approach of Surface Water Management (comprising blue/ green corridors, SuDS features and short sections of new surface water sewers). The location of these options is not available at the plan stage, so it has been assumed that they cover the entire area of the catchment. The screening shows 95 of the catchments require the HRA progressing to the appropriate assessment stage, 46 may require mitigation during construction and ongoing maintenance/operation and the remaining 108 require no further assessment. It is expected that the number requiring appropriate assessment will be reduced considerably when the location and/or more details regarding the options is available.

Acronyms / Abbreviations

HRA	Habitats Regulations Assessment
NWG	Northumbrian Water Group
DWMP	Drainage and Wastewater Management Plan
SEA	Strategic Environmental Assessment
L3	Level 3 (tactical planning unit from NWG's DWMP)
SuDS	Sustainable drainage system
SAC	Special Area of Conservation
SPA	Special Protection Area
cSAC	Candidate Special Area of Conservation
pSPA	Potential Special Protection Area
LSE	Likely Significant Effect
AA	Appropriate Assessment
IROPI	Imperative Reasons of Overriding Public Interest
GIS	Geographic Information System

1 Introduction

1.1 Background and Purpose

This document comprises the Stage 1 Screening of a Habitats Regulations Assessment (HRA), carried out to assess potential impacts of Northumbrian Water Group's (NWG) Drainage and Wastewater Management Plan (DWMP). This plan is being developed concurrently with the Strategic Environmental Assessment (SEA) process.

1.2 The Drainage Water Management Plan

DWMPs are long-term plans to set out efforts to provide robust and resilient drainage and wastewater systems and assess risks to drainage systems and stakeholders. Water UK have set out a framework for creating DWMPs[1], which sets out three levels of management structure, Level 1, Level 2 and Level 3. Level 1 has a company level scope, bringing together Level 2 and 3 in a high-level plan. Level 2 covers large strategic planning areas, made up of multiple catchments and wastewater treatment works. Finally, Level 3 (L3) is a tactical planning unit and covers a single wastewater treatment works and its catchment (in some cases this may be a collection of small or sub catchments for larger wastewater treatment works).

NWG's DWMP is currently undergoing an assessment process, in which a wide range of options have been considered. This list of options has now been preliminarily narrowed to below ground storage and a hybrid Surface Water Management option of concrete sewers and Sustainable Drainage Systems (SuDS) / blue/green corridors. More detail is provided in Section 2.2.

1.3 Habitats Regulations Assessment Process

This document has been prepared based on the methodology for HRA set out in the national guidance contained in 'Habitats regulations assessments: protecting a European site. Published 24 Feb 2021' (GOV.UK 2021). The guidance sets out a three-stage approach to HRA (as illustrated in Plate 1-1 Process of HRA below) and emphasises the iterative nature of the process.

Plate 1-1 Process of HRA

[1] Water UK DWMP Framework Report

Stage 1: Screening

The Screening Stage involves the determination of the European Sites which could potentially be affected by the Plan and their determining interests; and whether the implementation of the Plan could result in a 'Likely Significant Effect', either alone or in-combination with other Plans and Projects.

HRA case law (the 'Dilly Lane' case, 2008) determined that mitigation measures that were 'incorporated into the Project' or which 'formed part of the Project' could be considered at the Screening 'Likely Significant Effect' test stage of HRA (as long as they were effective). The ruling judge accepted that certain facets of a Project, which are intended to avoid or reduce negative impacts on a European Site (i.e., mitigation), can still be regarded as 'incorporated into the Project' if they are promoted that way by the developer.

However, a more recent ruling (Court of Justice of the European Union ('CJEU') People Over Wind and Sweetman v Coillte Teoranta (C-323/17)) concluded that mitigation measures intended to avoid or reduce impacts on a European Site could not be regarded as part of 'the Project' and thus should not be taken into account at the Screening Stage of HRA when judging whether Likely Significant Effects on the integrity of a European Site could occur.

Whilst the above case law relates specifically to Projects (rather than Plans), it is now generally accepted that any measures inherently part of the scheme design (described as 'embedded mitigation' in this report) which are not specifically incorporated into the scheme for ecological reasons, but nonetheless reduce ecological effects, can be considered at the HRA Screening Stage. Measures which have been specifically added to the Project to achieve the purpose of avoiding or reducing its harmful effects on a European Site (described as 'additional mitigation' in this report) should not be considered at the Screening Stage and an Appropriate Assessment is required. This distinction is yet to be tested by further case law but in the absence of any clear guidance or explanation of the ruling from the statutory authorities, appears to be the most practical and pragmatic approach in the light of the recent ruling. This approach is supported by articles in a recent Habitats Regulations Assessment Journal (DTA Publications, 2018).

In the event that Likely Significant Effects are identified at the Screening Stage, on the basis of objective information and in the absence of mitigation / avoidance measures, the Competent Authority should proceed to the next stage of assessment (Stage 2: Appropriate Assessment).

Stage 2: Appropriate Assessment

During Stage 2 (Appropriate Assessment), an assessment of whether there would be an adverse effect on the integrity of the European Site concerned, and the consideration of measures to address this effect, is required. The precautionary principle should be applied, with the focus being on objectively demonstrating, with supporting evidence and in light of appropriate mitigation, that there will be no adverse effects on the integrity of the European Site. Where this is not possible, or uncertainty remains, adverse effects must be assumed and consideration of Stage 3.

Stage 3: Derogation

Stage 3 determines whether a Plan or Project proposal, that would have an adverse effect on a European site, qualify for an exemption. There are three legal tests that need to be applied in order: there are no feasible alternative solutions that avoid damage or are less damaging to the site; the proposal needs to be carried out for imperative reasons of overriding public interest; and finally, the necessary compensation measures can be secured.

This report details the screening process and primarily involves assessing two criteria:

- Whether the proposal is directly connected with or necessary for the conservation management of a national site
- Whether the proposal risks having a significant effect on a national site on its own or in combination with other proposals

2 METHODS

2.1 Information Gathering and National Site Network Assessment

A total of 249 Level 3 catchments[2] (see Appendix B) from NWG's DWMP were provided by NWG and for the HRA process all selected options are being applied to each catchment. Given the strategic nature of the DWMP, the exact site location and details of the measures to be implemented within each catchment are not yet available, so for the purposes of this screening options cover the entire catchment. More details on selected options are provided in section 2.2. Many of these details are still subject to change, so the assessment here has been as conservative and accurate as possible with the information provided.

The national sites within and in proximity to the operating region for NWGs wastewater services Group (Northumberland, Durham, Tyne and Wear, and small areas of North Yorkshire, Cumbria, and Berwickshire) were identified, using GIS and a spatial join of NWG Level 1 areas (plus a 5km buffer) and SAC, SPA and Ramsar boundaries sourced from Natural England3. Each national site was assessed for its conservation objectives through both its selection features and relevant positive and negative impacts, for example a site may be highly impacted by marine pollution (impact code H03), and mildly impacted by grazing pressure (impact code A04). This information was obtained from each sites' standard data form4 (see Appendix A). Initially a 5km buffer, defined by professional judgement based on an initial evaluation of national sites and their qualifying feature ecological needs was used to determine which catchments could be screened out and which might need elevating to the appropriate assessment stage. Each L3 catchment was assigned all associated pressures of national sites they were within, or partially within 5km of.

[2] Water UK DWMP Framework Report
[3] SACs, SPAs, Ramsars https://naturalengland-defra.opendata.arcgis.com/
[4] List of SACs https://sac.jncc.gov.uk/site/, List of SPAs https://jncc.gov.uk/our-work/list-of-spas/

2.2 Options

NWG have selected primarily a single option, the provision of underground storage tanks, with several catchments adopting a hybrid option of Surface Water Management. Potential pressures to national sites associated with these options are outlined in Table 2-1

Table 2-1 Selected options and associated potential impacts

Option	Description	Potential pressures
Below-ground storage	Excavation of ground to install concrete storage tanks and associated infrastructure (connecting pipework etc.)	• Habitat loss both temporary and ongoing • Temporary disturbances both indirect (light, noise, vibration etc.) and direct (collision, erosion etc.) • Spread of non-native invasive species during construction • Contamination/pollution (only likely in the event of damage or insufficient planning)
Hybrid option, Surface Water Management	Creation of short sections of new concrete sewers, SuDS and/or blue/green corridors. Could involve excavation, and planting.	• Modification of water quality • Habitat loss (through replacement of existing habitat for new habitats) • Modifications to species interactions • Spread of non-native invasive species during construction • Contamination/pollution

2.3 Limitations

Details of national sites are provided and curated by third parties. Whilst the most up to date information on the location and relevant sites has been collected at the time of publication of this report, this data may change over time, and Stantec cannot be held responsible for any error in data collected.

At this stage of NWG's DWMP, details are still relatively high level and subject to change. Most importantly detailed information on where and how options will be implemented is not yet available. Without this information, this report has been prepared under the assumption that options are applied to the entirety of any L3 catchment, and that construction is not necessarily carried out in the most considerate fashion. When this information is available it is likely that considerably fewer L3 catchments will need progressing to appropriate assessment.

3 Screening

There is no evidence currently available to suggest any options within the L3 catchments are required to maintain or can improve the conservation status of any national sites considered in this assessment. Until such evidence is available no L3 catchments can be safely screened out for this reason.

There are 106 L3 catchments a significant distance (over 5km) from all national sites and can be safely screened out from further assessment. The remaining 143 L3 sites will be further examined in Section 4 using a high-level assessment of the relevant national sites and their potential for impact. The results screening results for each individual catchment are provided in Appendix B.

4 High Level Assessment

A total of 49 L3 catchments are within or partially within a national site. Without more specific option details, it must be recommended that options within these L3 catchments are progressed to the appropriate assessment stage. If the location of the options is provided, and it is shown that the entirety of the planned works is outside of any national sites, the screening process conducted for those L3 catchments within 5km of a national site but not overlapping, will need repeating for those sites.

The remaining 94 catchments have been assessed against their associated national site pressures (see Appendix B). Affected national sites and pressures associated with the impacts identified in Table 2.2 are listed in Table 4.1.

Of these 94 L3 catchments:

- two L3 catchments require no further assessment,
- 46 require mitigation (until plan location details show otherwise) and
- 46 require appropriate assessment (until location details show otherwise).

Table 4.1 – L3 catchments by national site

National site	No. of L3 catchments within 5km	Relevant national site pressures
Berwickshire & North Northumberland Coast (SAC)	8	• I01 - Invasive non-native species • J02 - Human induced changes in hydraulic conditions • H01 - Pollution to surface waters (limnic & terrestrial, marine & brackish) • G05 - Other human intrusions and disturbances
Castle Eden Dene (SAC)	3	• I02 - Problematic native species • I01 - Invasive non-native species
Durham Coast (SAC)	18	• I01 - Invasive non-native species • J02 - Human induced changes in hydraulic conditions • K01 - Abiotic (slow) natural processes • A08 - Fertilisation • G05 - Other human intrusions and disturbances
Ford Moss (SAC)	4	• J02 - Human induced changes in hydraulic conditions
Newham Fen (SAC)	1	Air pollution is primary pressure on site so selected options unlikely to influence site except where directly overlapping.
North Pennine Dales Meadows (SAC)	4	• A03 - Mowing / cutting of grassland • A08 - Fertilisation • A02 - Modification of cultivation practices
River Tweed (SAC)	6	• H02 - Pollution to groundwater (point sources and diffuse sources) • I01 - Invasive non-native species • J02 - Human induced changes in hydraulic conditions

Simonside Hills (SAC)	2	• A02 - Modification of cultivation practices • G05 - Other human intrusions and disturbances • I01 - Invasive non-native species
Thrislington (SAC)	13	• M01 - Changes in abiotic conditions
Tyne & Allen River Gravels (SAC)	6	• I01 - Invasive non-native species • K02 - Biocenotic evolution, succession
Tyne & Nent (SAC)	1	• K01 – Abiotic (slow) natural processes • G05 – Other human intrusions and disturbances • K02 - Biocenotic evolution, succession
North Pennine Moors (SAC & SPA)	12	• K04 - Interspecific floral relations • J02 - Human induced changes in hydraulic conditions • A04 - Grazing • A02 - Modification of cultivation practices
North York Moors (SAC & SPA)	11	• K04 - Interspecific floral relations • I01 - Invasive non-native species • M01 - Changes in abiotic conditions
Northumberland Marine (SPA)	15	This site's primary pressures are aquaculture and human recreational pressures which are not linked to any of the selected options.
Teesmouth and Cleveland Coast (SPA & RAMSAR)	12	• J03 - Other ecosystem modifications • I01 - Invasive non-native species • M02 - Changes in biotic conditions • H07 - Other forms of pollution • H03 - Marine water pollution • G05 - Other human intrusions and disturbances • M01 - Changes in abiotic conditions
Holburn Lake & Moss (SPA & RAMSAR)	1	• I01 - Invasive non-native species • G05 - Other human intrusions and disturbances • K03 - Interspecific faunal relations • M02 - Changes in biotic conditions
Lindisfarne (SPA & RAMSAR)	3	• H01 - Pollution to surface waters (limnic & terrestrial, marine & brackish) • I01 - Invasive non-native species • M02 - Changes in biotic conditions • K03 - Interspecific faunal relations
Northumbria Coast (SPA & RAMSAR)	29	• M02 - Changes in biotic conditions • K03 - Interspecific faunal relations • H01 - Pollution to surface waters (limnic & terrestrial, marine & brackish) • G05 - Other human intrusions and disturbances

The two chosen options have been assessed against relevant pressures, showing which associated pressures require mitigation or further assessment. Each pressure has been rated as either negligible, low, medium, or high, where:

- Negligible requires no further action
- Low may require some minor mitigation depending on option location or specifics
- Medium is likely to require mitigation, or must be significantly distanced from the nearby national site

- High is likely to require appropriate assessment unless the location is further than 5km from the national site

Mitigations are suggested in Table 4.3 that will reduce the threat posed by pressures marked as medium.

It should be noted that A03 and A04 are primarily positive pressures but can also be negative (meaning that the national site requires a specific level of regularity and/or type of mowing/cutting or grazing). For this report it is assumed that any site with A03 or A04 listed as a pressure is negatively affected. This should be re-assessed when further information is available about the options and option locations.

Table 4.2 – Assessment of pressures against options. Cells are highlighted in white for negligible, green for low, yellow for medium and red for high threat to national sites.

Pressure	Option 1 assessment	Option 2 assessment
A03 - Mowing / cutting of grassland	Some mowing/cutting may be required during construction of storage tank location and may be continued with replacement plant community after constrruction.	Some mowing/cutting may be required during construction, and this may continue through maintenance.
A04 - Grazing	Temporary removal of grazing pressure may occur for a small area during construction. Grazing may be used more long term to maintain the area.	Changes in grazing may occur during construction and changes in plant assemblages may disrupt or encourage further grazing.
A08 - Fertilisation	Level of fertilisation is unlikely to change.	Level of fertilisation is unlikely to change, unless used to encourage vegetation growth within blue/green corridors.
G05 - Other human intrusions and disturbances	Disturbances may be high during construction but should be temporary. Potential for ongoing disturbance through maintenance.	Disturbances likely to be high during construction. Ongoing disturbance may be increased with better access to area provided during construction. Potential for ongoing disturbance through maintenance.
H01 - Pollution to surface waters (limnic & terrestrial, marine & brackish)	Storage tank whilst connected to the sewer network has the potential to leak pollutants to the surroundings.	Potential for pollution to be released into blue/green corridors. Where these corridors are still being established there is a risk of pollution spread.
H02 - Pollution to groundwater (point sources and diffuse sources)	Storage tank whilst connected to the sewer network has the potential to leak pollutants to the surroundings.	Potential for pollution to be released into blue/green corridors. Where these corridors are still being established there is a risk of pollution spread.
I01 - Invasive non-native species	Risk of spreading non-native invasive species during construction.	Risk of spreading non-native invasive species during construction. Risk of corridors becoming pathways for further non-native invasive species spread.

I02 - Problematic native species	This pressure refers to deer grazing and non-yew conifer growth at Castle Eden Dene. Option 1 will unlikely increase this pressure.	This pressure refers to deer grazing and non-yew conifer growth at Castle Eden Dene. Option 2 may have potential to expand deer habitat.
J02 - Human induced changes in hydraulic conditions	This option is likely to change hydraulic conditions particularly during storm events, by changing downstream flowrates.	This option is highly likely to change hydraulic conditions, reducing downstream flowrates.
K01 - Abiotic (slow) natural processes	The two sites that are susceptible to this pressure are unlikely to be disrupted by option 1 in this way. At Durham coast, the slow erosion/geological processes would make the option impractical in the locations they occur. At Tyne and Nent, construction and maintenance of this option would be unlikely to change the level (or rate of change) of soil metals.	The two sites that are susceptible to this pressure are unlikely to be disrupted by option 1 in this way. At Durham coast, the slow erosion/geological processes would make the option impractical in the locations they occur. At Tyne and Nent, construction and maintenance of this option would be unlikely to change the level (or rate of change) of soil metals.
K02 - Biocenotic evolution, succession	Risk of disruption to succession pattern through removal of species or spread of species during construction.	Risk to changes in succession through the establishment of differing plant communities in the blue/green corridors.
K04 - Interspecific floral relations	Risk of unbalancing floral relations through higher removal or damage of any one species, or introduction of new species.	Risk to unbalancing floral relations through the establishment of differing plant communities in the blue/green corridors.
M01 - Changes in abiotic conditions	Risk of temporary changes during construction, particularly if these are irreversible.	Risk of modifying ongoing abiotic conditions with the establishment of blue/green corridors.

Table 4.3 – Suggested mitigations for medium level threats

Pressure	Option 1 assessment	Option 2 assessment
A03 - Mowing / cutting of grassland	Replace vegetation communities after construction and ensure that level of mowing/cutting is appropriate for nearby national site features. This is likely a localised threat, so mitigation is only required if location is within 500m.	Replace vegetation communities after construction and ensure blue/green corridor plant communities do not require mowing or cutting. This is likely a localised threat, so mitigation is only required if location is within 500m.
A04 - Grazing	Ensure replacement plant communities do not require grazing. This is likely a localised threat, so mitigation is only required if location is within 500m.	Ensure blue/green corridor plant communities do not require grazing. This is likely a localised threat, so mitigation is only required if location is within 500m.

G05 - Other human intrusions and disturbances	Minimise construction footprint (including number of staff on site and access) and keep maintenance required as low as possible if general visual disturbance is detectable at National site. For other disturbances such as light pollution or vibration, ensure location is distant enough for disturbance not to occur, or appropriate assessment will be required.	Minimise construction footprint (including number of staff on site and access) and keep maintenance required as low as possible if general visual disturbance is detectable at National site. For other disturbances such as light pollution or vibration, ensure location is distant enough for disturbance not to occur, or appropriate assessment will be required. Ensure that if location is within visual range of National site that access to site is not improved to public.
H01 - Pollution to surface waters (limnic & terrestrial, marine & brackish)	With appropriate construction of underground storage, the risk of leaks should be negligible. Ensure that any connecting structures/pipes will not leak, and they are regularly monitored.	Ensure location is downstream from National site or ensure blue/green corridors are fully established before any overflow is allowed.
H02 - Pollution to groundwater (point sources and diffuse sources)	With appropriate construction of underground storage, the risk of leaks should be negligible. Ensure that leak risk is minimised for any connecting structures/pipes, and they are regularly monitored.	Ensure location is downstream from National site or ensure blue/green corridors are fully established before any overflow is allowed.
I01 - Invasive non-native species	A comprehensive biosecurity plan should be in place for any construction or maintenance access. Ensure personnel and equipment is cleaned and/or disinfected before entering and leaving the site.	A comprehensive biosecurity plan should be in place for any construction or maintenance access. Ensure personnel and equipment is cleaned and/or disinfected before entering and leaving the site. Survey for nearby non-native invasive species to ensure corridors will not provide an immediate non-native spread along them. Monitor corridors for the presence of non-native invasive species going forward.
I02 - Problematic native species	N/A	Ensure planted vegetation does not include non-yew conifers and install deer exclusion features if adjacent to Castle Eden Dene.
J02 - Human induced changes in hydraulic conditions	If the location of this option is downstream of all relevant national sites within 5km, or outside a 5km radius from all relevant sites, then no further action is required. Otherwise, appropriate assessment is required.	If the location of this option is downstream of all relevant national sites within 5km, or outside a 5km radius from all relevant sites, then no further action is required. Otherwise, appropriate assessment is required.

K02 - Biocenotic evolution, succession	Ensure plant community is returned/replanted accurately after disturbance of construction.	Ensure plant community is returned/replanted accurately after disturbance of construction. For blue/green corridors, ensure plant community will not disrupt succession on the relevant National sites (check successional stages of species planted and dispersal distances).
K04 - Interspecific floral relations	Ensure plant community is returned/replanted accurately after disturbance of construction, and that construction is carried out in winter when interspecific floral relations are likely dormant.	Ensure plant community is returned/replanted accurately after disturbance of construction, and that construction is carried out in winter when interspecific floral relations are likely dormant. For blue/green corridors ensure plant community will not disrupt existing flora on the relevant National sites (check successional stages of species planted and dispersal distances).
M01 - Changes in abiotic conditions	Ensure abiotic conditions are not significantly modified during or after construction.	Ensure abiotic conditions are not significantly modified during or after construction.

5 Conclusions

A HRA screening has been carried out on a total of 249 L3 catchments as part of NWG DWMP, the screening outcome for each individual catchment is available in Appendix B, including recommendations for further screening and appropriate assessment. Two options have been assessed for each catchment and recommendations are provided for each option in Table 4.3. In total, 95 L3 catchments require further progressing to an appropriate assessment stage of the HRA. This recommendation is currently based on assuming that the options are placed in the worst possible locations (for example within a national site, or adjacent etc for those that do not intersect a national site). It is likely that with further details that many of these requiring appropriate assessment can be reduced to only requiring mitigation during construction and ongoing maintenance. Before completion of the final DWMP, the following needs to be completed:

1. Using Appendix B and the DWMP, identify individual L3 catchments where no measures are proposed through the final DWMP, to screen out those requiring no further work.

2. Appropriate assessment of the L3 catchments that have been identified as requiring stage 2 appropriate assessment (currently 95 catchments, subject to step 1).

3. The 46 L3 sites requiring mitigation (dependent on option) must have the recommended mitigations included in the plan, or a detailed enough location provided to ensure significant distance from the nearby national site (currently 46 catchments, subject to step 1).

Appendix A National sites

SAC	Reason for SAC designation	
Ford Moss	Annex I habitats that are a primary reason for selection Active raised bogs * Priority feature Ford Moss is a largely intact 46 ha bog in undulating topography in the rain-shadow of the Cheviot Hills. Although partially drained, the re-wetted surface contains many waterlogged areas with species typical of peat-formation. Thus, although there are drier purple moor-grass *Molinia caerulea*-dominated parts, it is considered to be predominantly active raised bog. There is a 12 m depth of peat within the confining basin. The vegetation includes species of raised bog as well as poor-fen, which is also indicated in places by the presence of white sedge *Carex curta* where water runs into the bog from the surrounding slopes.	
	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site NA	
	Annex II species that are a primary reason for selection NA	
	Annex II species present as a qualifying feature, but not a primary reason for site selection NA	
	Negative impacts	Positive impacts
	H04 - Air pollution, air-borne pollutants	A02 - Modification of cultivation practices
	J02 - Human induced changes in hydraulic conditions	A04 - Grazing
	B02 - Forest and Plantation management & use	
Tyne & Nent	Annex I habitats that are a primary reason for selection Calaminarian grasslands of the Violetalia calaminariae At this site in the north-west Pennines, Calaminarian grassland occurs in association with lead mine waste and river shingles of the rivers South Tyne and Nent. This site supports a rich metallophyte flora with substantial populations of six species of higher	

<table>
<tr><td></td><td>plant metallophytes: thrift Armeria maritima, moonwort Botrychium lunaria, Pyrenean scurvygrass Cochlearia pyrenaica, spring sandwort Minuartia verna, alpine penny-cress Thlaspi caerulescens and mountain pansy Viola lutea. The site is also of great importance for its lichen communities associated with both spoil and river shingle. A number of rare and scarce species are present, including Peltigera venosa, P. neckeri and Sarcosagium campestre var. macrosporum. The site shows the full succession from open sparsely vegetated shingle and spoil to closed turf. Transitions from Calaminarian grassland to both calcareous grassland and dry heath also occur.</td></tr>
<tr><td></td><td>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA</td></tr>
<tr><td></td><td>Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td>Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td><table>
<tr><th>Negative impacts</th><th>Positive impacts</th></tr>
<tr><td>H04 - Air pollution, air-borne pollutants</td><td>B02 - Forest and Plantation management & use</td></tr>
<tr><td>K01 - Abiotic (slow) natural processes</td><td>A04 - Grazing</td></tr>
<tr><td>U - Unknown threat or pressure</td><td>B06 - Grazing in forests/ woodland</td></tr>
<tr><td>G05 - Other human intrusions and disturbances</td><td>A02 - Modification of cultivation practices</td></tr>
<tr><td>K02 - Biocenotic evolution, succession</td><td></td></tr>
</table></td></tr>
<tr><td>Newham Fen</td><td>Annex I habitats that are a primary reason for selection

<u>Alkaline fens</u>

Newham is important as a lowland short sedge fen in north-east England, a part of the UK in which Alkaline fens are rare. The site is an example of basin fen, developed from the hydroseral succession of a small lake. The main fen community is M13 Schoenus nigricans – Juncus subnodulosus mire and M9 Carex rostrata – Calliergon cuspidatum/giganteum mire, and there are transitions to S25 Phragmites australis – Eupatorium cannabinum tall-herb fen, MG1 Arrhenatherum elatius grassland and W2 Salix cinerea – Betula pubescens – Phragmites australis woodland. A number of rare species occur at this site, including narrow-leaved</td></tr>
</table>

<table>
<tr><td></td><td colspan="2">marsh-orchid Dactylorhiza traunsteineri, coralroot orchid Corallorhiza trifida, dark-leaved willow Salix myrsinifolia and round-leaved wintergreen Pyrola rotundifolia.</td></tr>
<tr><td></td><td colspan="2">Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA</td></tr>
<tr><td></td><td colspan="2">Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td colspan="2">Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td>Negative impacts</td><td>Positive impacts</td></tr>
<tr><td></td><td>H04 - Air pollution, air-borne pollutants</td><td>A04 - Grazing</td></tr>
<tr><td></td><td></td><td>D05 - Improved access to site</td></tr>
<tr><td>Thrislington</td><td colspan="2">Annex I habitats that are a primary reason for selection

<u>Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)</u>

Thrislington is a small site but nonetheless contains the largest of the few surviving stands of CG8 Sesleria albicans – Scabiosa columbaria grassland. This form of calcareous grassland is confined to the Magnesian Limestone of County Durham and Tyne and Wear, north-east England. It now covers less than 200 ha and is found mainly as small scattered stands.</td></tr>
<tr><td></td><td colspan="2">Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA</td></tr>
<tr><td></td><td colspan="2">Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td colspan="2">Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td>Negative impacts</td><td>Positive impacts</td></tr>
</table>

	H04 - Air pollution, air-borne pollutants	D05 - Improved access to site
	M01 - Changes in abiotic conditions	
	U - Unknown threat or pressure	
Castle Eden Dene	Annex I habitats that are a primary reason for selection **Taxus baccata woods of the British Isles** * Priority feature Castle Eden Dene in north-east England represents the most extensive northerly native occurrence of yew *Taxus baccata* woods in the UK. Extensive yew groves are found in association with ash-elm *Fraxinus-Ulmus* woodland and it is the only site selected for yew woodland on magnesian limestone in north-east England.	
	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site NA	
	Annex II species that are a primary reason for selection NA	
	Annex II species present as a qualifying feature, but not a primary reason for site selection NA	
	Negative impacts	Positive impacts
	I02 - Problematic native species	D05 - Improved access to site
	B02 - Forest and Plantation management & use	
	H04 - Air pollution, air-borne pollutants	
	I01 - Invasive non-native species	
Durham Coast	Annex I habitats that are a primary reason for selection **Vegetated sea cliffs of the Atlantic and Baltic Coasts** The Durham Coast is the only example of vegetated sea cliffs on magnesian limestone exposures in the UK. These cliffs extend along the North Sea coast for over 20 km from South Shields southwards to Blackhall Rocks. Their vegetation is unique in the British Isles and consists of a complex mosaic of paramaritime, mesotrophic and calcicolous grasslands, tall-herb fen, seepage flushes and wind-pruned scrub. Within these habitats rare species of contrasting phytogeographic distributions often grow together forming unusual and species-rich communities	

<table>
<tr><td></td><td>of high scientific interest. The communities present on the sea cliffs are largely maintained by natural processes including exposure to sea spray, erosion and slippage of the soft magnesian limestone bedrock and overlying glacial drifts, as well as localised flushing by calcareous water.</td></tr>
<tr><td></td><td>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA</td></tr>
<tr><td></td><td>Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td>Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td><table>
<tr><td>Negative impacts</td><td>Positive impacts</td></tr>
<tr><td>I01 - Invasive non-native species</td><td>A03 - Mowing / cutting of grassland</td></tr>
<tr><td>J02 - Human induced changes in hydraulic conditions</td><td>D05 - Improved access to site</td></tr>
<tr><td>K01 - Abiotic (slow) natural processes</td><td>A02 - Modification of cultivation practices</td></tr>
<tr><td>A08 - Fertilisation</td><td>B02 - Forest and Plantation management & use</td></tr>
<tr><td>G05 - Other human intrusions and disturbances</td><td></td></tr>
</table></td></tr>
<tr><td>Border Mires -Kielder Butterburn</td><td>Annex I habitats that are a primary reason for selection

<u>Blanket bogs (* if active bog)</u> * Priority feature
This complex is part of what was once the largest continuous tract of Blanket bogs across northern England and is particularly important for the quality of the transition it represents between blanket bog and raised mire. Although much of the land has been afforested, significant areas of the original bog remain throughout the forested expanse and these have been selected to represent this habitat type in northern England. The climate is wetter here than in some other parts of northern England, and this is reflected in the composition of the vegetation, which is dominated by species of cottongrass Eriophorum and a reduced cover of heather Calluna vulgaris. At Butterburn Flow the wetter climate is also emphasised by quite distinct surface patterning of Sphagnum hollows separated by Sphagnum ridges in the largest of the open areas. It is a very good example of the Sphagnum-rich cross-leaved heath Erica tetralix and Sphagnum papillosum vegetation type.

<u>Transition mires and quaking bogs</u>
Border Mires, Kielder – Butterburn is made up of several individual sites running north-east from Carlisle. Collectively, these sites contain a wide range of bog-moss Sphagnum species, for example 11 on Caudbeck alone, along with an almost equally large number of Carex species.</td></tr>
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<table>
<tr><td></td><td colspan="2">The transition mire element of these sites is relatively small, but is an important component of one of the least-damaged and more valuable species-rich mire complexes in England.</td></tr>
<tr><td></td><td colspan="2">Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA

<u>Northern Atlantic wet heaths with Erica tetralix</u>

<u>European dry heaths</u>

<u>Petrifying springs with tufa formation (Cratoneurion)</u> * Priority feature</td></tr>
<tr><td></td><td colspan="2">Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td colspan="2">Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td>Negative impacts</td><td>Positive impacts</td></tr>
<tr><td></td><td>A02 - Modification of cultivation practices</td><td>B02 - Forest and Plantation management & use</td></tr>
<tr><td></td><td>M02 - Changes in biotic conditions</td><td>D05 - Improved access to site</td></tr>
<tr><td></td><td>H04 - Air pollution, air-borne pollutants</td><td>A04 - Grazing</td></tr>
<tr><td></td><td>J02 - Human induced changes in hydraulic conditions</td><td>B06 - Grazing in forests/ woodland</td></tr>
<tr><td></td><td>B02 - Forest and Plantation management & use</td><td>A02 - Modification of cultivation practices</td></tr>
<tr><td>Simonside Hills</td><td colspan="2">Annex I habitats that are a primary reason for selection

<u>European dry heaths</u>
Species occurrence description not yet available.</td></tr>
<tr><td></td><td colspan="2">Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

<u>Blanket bogs (* if active bog)</u> * Priority feature</td></tr>
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<tr><td></td><td colspan="2"></td></tr>
<tr><td></td><td colspan="2">Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td colspan="2">Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td>Negative impacts</td><td>Positive impacts</td></tr>
<tr><td></td><td>A02 - Modification of cultivation practices</td><td>B06 - Grazing in forests/ woodland</td></tr>
<tr><td></td><td>G05 - Other human intrusions and disturbances</td><td>A04 - Grazing</td></tr>
<tr><td></td><td>G01 - Outdoor sports and leisure activities, recreational activities</td><td>B02 - Forest and Plantation management & use</td></tr>
<tr><td></td><td>J01 - Fire and fire suppression</td><td>A02 - Modification of cultivation practices</td></tr>
<tr><td></td><td>I01 - Invasive non-native species</td><td></td></tr>
<tr><td>Harbottle Moors</td><td colspan="2">Annex I habitats that are a primary reason for selection

<u>European dry heaths</u>

At a little under 400 m altitude, Harbottle Moors is a relatively low-lying example of upland European dry heath. Situated on Carboniferous rocks, the heathland community is dominated by heather Calluna vulgaris with some crowberry Empetrum nigrum, bilberry Vaccinium myrtillus and bracken Pteridium aquilinum. Some areas are relatively species-rich, with up to six different dwarf shrub species being found. This may suggest a fairly un-intensive management history with regard to grazing and burning.</td></tr>
<tr><td></td><td colspan="2">Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA</td></tr>
<tr><td></td><td colspan="2">Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td colspan="2">Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td>Negative impacts</td><td>Positive impacts</td></tr>
<tr><td></td><td>H04 - Air pollution, air-borne pollutants</td><td>A02 - Modification of cultivation practices</td></tr>
</table>

	I01 - Invasive non-native species	A04 - Grazing
	G05 - Other human intrusions and disturbances	
Tyne & Allen River Gravels	Annex I habitats that are a primary reason for selection **Calaminarian grasslands of the Violetalia calaminariae** This site in north-east England encompasses the most extensive, structurally varied and species-rich examples of riverine Calaminarian grasslands in the UK. The river gravels contain a range of structural types, ranging from a highly toxic, sparsely vegetated area with abundant lichens through to closed willow/alder *Salix/Alnus* woodland. In addition, the site is of considerable functional interest for the series of fossilised river channel features. Spring sandwort *Minuartia verna* and thrift *Armeria maritima* are particularly abundant, and there are several rare species, including Young's helleborine *Epipactis youngiana*, which has its main UK population at this site. The site is also of great importance for its lichen communities. A number of rare and scarce species are present, including the Red Data Book-listed *Peltigera venosa*.	
	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site NA	
	Annex II species that are a primary reason for selection NA	
	Annex II species present as a qualifying feature, but not a primary reason for site selection NA	
	Negative impacts	Positive impacts
	H04 - Air pollution, air-borne pollutants	B02 - Forest and Plantation management & use
	I01 - Invasive non-native species	A02 - Modification of cultivation practices
	K02 - Biocenotic evolution, succession	
	U - Unknown threat or pressure	
Roman Wall Loughs	Annex I habitats that are a primary reason for selection **Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation** The Roman Wall Loughs area contains three natural eutrophic lakes, Crag, Broomlee and Greenlee Loughs. Together the loughs contain 11 species of pondweed *Potamogeton* including *P. lucens*, *P. pusillus*, and *P. obtusifolius. P. gramineus* occurs in all three loughs in an unusual	

<table>
<tr><td></td><td>association with stoneworts Chara spp. The nationally-rare autumnal water-starwort Callitriche hermaphroditica occurs in Crag Lough. Shoreweed Littorella uniflora grows in Broomlee and Greenlee Loughs, and greater bladderwort Utricularia vulgaris in the latter.</td></tr>
<tr><td></td><td>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA</td></tr>
<tr><td></td><td>Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td>Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td><table><tr><td>Negative impacts</td><td>Positive impacts</td></tr><tr><td>I01 - Invasive non-native species</td><td>A02 - Modification of cultivation practices</td></tr><tr><td>U - Unknown threat or pressure</td><td>A03 - Mowing / cutting of grassland</td></tr><tr><td>H02 - Pollution to groundwater (point sources and diffuse sources)</td><td>A04 - Grazing</td></tr><tr><td></td><td>B02 - Forest and Plantation management & use</td></tr></table></td></tr>
<tr><td>North Pennine Dales Meadows</td><td>Annex I habitats that are a primary reason for selection

<u>Mountain hay meadows</u>

The North Pennine Dales contain a series of isolated fields within several north Pennine and Cumbrian valleys. The site encompasses the range of variation exhibited by Mountain hay meadows in the UK and contains the major part of the remaining UK resource of this habitat type. The grasslands included within the site exhibit very limited effects of agricultural improvement and show good conservation of structure and function. A wide range of rare and local meadow species are contained within the meadows, including globeflower Trollius europaeus, the lady's-mantles Alchemilla acutiloba, A. monticola and A. subcrenata, and spignel Meum athamanticum</td></tr>
<tr><td></td><td>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

<u>Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)</u></td></tr>
</table>

<table>
<tr><td></td><td>Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td>Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td>
<table>
<tr><th>Negative impacts</th><th>Positive impacts</th></tr>
<tr><td>A03 - Mowing / cutting of grassland</td><td>A03 - Mowing / cutting of grassland</td></tr>
<tr><td>A08 - Fertilisation</td><td>D05 - Improved access to site</td></tr>
<tr><td>H04 - Air pollution, air-borne pollutants</td><td>A04 - Grazing</td></tr>
<tr><td>A02 - Modification of cultivation practices</td><td>A02 - Modification of cultivation practices</td></tr>
<tr><td></td><td>B06 - Grazing in forests/ woodland</td></tr>
<tr><td></td><td>D05 - Improved access to site</td></tr>
<tr><td></td><td>B02 - Forest and Plantation management & use</td></tr>
</table>
</td></tr>
<tr><td>Tweed Estuary</td><td>Annex I habitats that are a primary reason for selection

<u>Estuaries</u>

The Tweed Estuary is a complex estuary, which discharges into the North Sea. It is a long narrow estuary, which is still largely natural and undisturbed, with its water quality classified as excellent throughout. It supports a wide range of habitats compared with other estuaries in north-east England. At its mouth there are substantial sandbanks and some areas of rocky shore. Further upstream, large areas of estuarine boulders and cobbles overlie sediment flats and extend into subtidal areas of the channel. Sheltered estuarine mud and sandflats occur away from the fast-flowing river channel. A wide range of littoral sediments occurs within the estuary. These range from exposed east-facing sandy shores at the estuary mouth, including its sheltering sand-spit, to muddy gravels where the river is actively eroding the banks. The most exposed sandy shores are subject both to wave action and, in places, the scouring action of the outflowing river; their mobile infauna (crustaceans and a few polychaetes) and ephemeral algae reflect these conditions. Species and habitat diversity rises with increasing shelter, until increasingly low-salinity estuarine conditions upstream lead to naturally low infaunal diversity, dominated by characteristic species that are tolerant of brackish-water conditions. Fish species include the rare anadromous 1102 allis shad Alosa alosa, which runs in the estuary, migratory 1106 Atlantic salmon Salmo salar, and occasional records of 1099 river lamprey Lampetra fluviatilis and 1095 sea lamprey Petromyzon marinus.
<u>Mudflats and sandflats not covered by seawater at low tide</u>

The Tweed is a long narrow estuary with a wide variety of intertidal mudflat and sandflat communities. Sandstell Point, at the mouth of the estuary, is a wide spit of clean mobile sand. This sand is subject both to wave action and, in places, the scouring action of the outflowing river, and is characterised by a mobile infauna (mainly crustaceans such as Eurydice pulchra and Bathyporeia spp. and a few polychaetes) which</td></tr>
</table>

<table>
<tr><td></td><td>reflect these conditions. On the more sheltered west-facing shore of this spit, and on Calot Shad on the opposite bank, reduced mobility of the sand allows robust polychaetes such as Scolelepis squamata and Paraonis fulgens to occur with the crustaceans. Both biotopes are highly representative of the north-east of England. Further upstream at Yarrow Slake, more sheltered areas of muddy sand are characterised by polychaetes, amphipods, oligochaetes and enchytraeids that are characteristic species tolerant of brackish conditions.</td></tr>
<tr><td></td><td>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA</td></tr>
<tr><td></td><td>Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td>Annex II species present as a qualifying feature, but not a primary reason for site selection

<u>Sea lamprey</u> Petromyzon marinus

<u>River lamprey</u> Lampetra fluviatilis</td></tr>
<tr><td></td><td><table><tr><td>Negative impacts</td><td>Positive impacts</td></tr><tr><td>G01 - Outdoor sports and leisure activities, recreational activities</td><td></td></tr><tr><td>H01 - Pollution to surface waters (limnic & terrestrial, marine & brackish)</td><td></td></tr><tr><td>G05 - Other human intrusions and disturbances</td><td></td></tr><tr><td>I01 - Invasive non-native species</td><td></td></tr><tr><td>J02 - Human induced changes in hydraulic conditions</td><td></td></tr></table></td></tr>
<tr><td>River Tweed</td><td>Annex I habitats that are a primary reason for selection

<u>Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation</u>

The Tweed represents sub-type 2 in the north-eastern part of its range. It is the most species-rich example, by far, of a river with Ranunculus in Scotland, and is the only site selected for this habitat in Scotland. The river has a high ecological diversity which reflects the mixed geology of the catchment. Stream water-crowfoot Ranunculus penicillatus ssp. pseudofluitans, a species of southern rivers and streams, here occurs at its most northerly location as does fan-leaved water-crowfoot R. circinatus, along with river water-crowfoot R.</td></tr>
</table>

	fluitans, common water-crowfoot *R. aquatilis*, pond water-crowfoot *R. peltatus* and a range of hybrids. The Tweed is also the most northerly site for flowering-rush *Butomus umbellatus*.
	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site NA
	Annex II species that are a primary reason for selection **Atlantic salmon** *Salmo salar* The River Tweed supports a very large, high-quality salmon *Salmo salar* population in a river which drains a large catchment on the east coast of the UK, with sub-catchments in both Scotland and England. The Tweed is the best example in Britain of a large river showing a strong nutrient gradient along its length, with oligotrophic conditions in its headwaters, and nutrient-rich lowland conditions just before it enters the sea at Berwick. The high proportion of the River Tweed accessible to salmon, and the variety of habitat conditions in the river, has resulted in the Scottish section of the river supporting the full range of salmon life-history types, with sub-populations of spring, summer salmon and grilse all being present. The extensive system supports a significant proportion of the Scottish salmon resource. In recent years, the salmon catch in the River Tweed is the highest in Scotland, with up to 15% of all salmon caught. Considerable work has been done by the Scottish Environment Protection Agency (and previously the Tweed River Purification Board) and the River Tweed Foundation in tackling pollution and easing the passage of salmon past artificial barriers in the river. This has reversed many of the river's historical problems with water quality and access for salmon. **Otter** *Lutra lutra* This large river system contains extensive water and riparian habitat suitable for otters *Lutra lutra*. The extensive tributary burns provide good feeding habitat. The area provides extensive suitable habitat for all the necessary aspects of otter's life cycle and the site is a good representative of the south-east lowlands of Scotland and the north-east of England.
	Annex II species present as a qualifying feature, but not a primary reason for site selection **Sea lamprey** *Petromyzon marinus* **Brook lamprey** *Lampetra planeri*

<table>
<tr><td></td><td><u>River lamprey</u> Lampetra fluviatilis
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<tr><td>Negative impacts</td><td>Positive impacts</td></tr>
<tr><td>H02 - Pollution to groundwater (point sources and diffuse sources)</td><td>A06 - Annual and perennial non-timber crops</td></tr>
<tr><td>I01 - Invasive non-native species</td><td>A02 - Modification of cultivation practices</td></tr>
<tr><td>J02 - Human induced changes in hydraulic conditions</td><td>A04 - Grazing</td></tr>
</table></td></tr>
<tr><td>Moor House-Upper Teesdale</td><td>Annex I habitats that are a primary reason for selection

<u>Hard oligo-mesotrophic waters with benthic vegetation of Chara spp.</u>

This site includes a single small hard oligo-mesotrophic waterbody, Tarn Dub, an upland pool which is impermanent in nature and situated on the slopes of Cronkley Fell. A species-poor flora includes stoneworts Chara spp. in the deeper parts, as well as shoreweed Littorella uniflora, the aquatic moss Fontinalis antipyretica and tubular water-dropwort Oenanthe fistulosa.
<u>Alpine and Boreal heaths</u>

Moor House – Upper Teesdale has the most extensive area of Alpine and Boreal heaths south of Scotland and is the best southern outlier. The main sub-type is H19 Vaccinium myrtillus – Cladonia arbuscula heath, which occurs on an extensive plateau. Characteristically (as in the Scottish Highlands) there is an abundance of lichens, especially Cladonia species, but on this site there is also an unusual abundance of large clumps of the montane lichen Cetraria islandica. At the edge of the plateau Vaccinium – Cladonia heath gives way below to a wind-clipped form of H12 Calluna vulgaris – Vaccinium myrtillus heath. which grades into taller heaths of the same community lower down the slopes. These represent alpine to boreal transitions which, in the more severe climate of the Highlands, would be represented by lichen- or bryophyte-rich prostrate Calluna heaths. Similarly, on one level summit at an altitude of 600 m, wind-clipped heather of a short but upright growth form occurs among a profusion of lichens, especially Cladonia species. This constitutes an unusual alpine/subalpine form of Calluna – Vaccinium heath that is very local in England.
<u>Juniperus communis formations on heaths or calcareous grasslands</u>

This site represents Juniperus communis formations on a more acidic substrate in north-east England. It has the second most extensive area of juniper scrub in UK and the largest south of Scotland. The main area of juniper scrub grows on the igneous whin-sill, at moderately high altitude. In Upper Teesdale the juniper has developed mainly on heath and is of the W19 Juniperus communis – Oxalis acetosella type. There are transitions to dwarf-shrub heath, acidic grasslands and whin-sill cliffs. Small patches of juniper scrub also occur on calcareous soils, including the sugar limestone grassland for which this site is famous. Palaeo-environmental evidence indicates that juniper scrub has been present continuously since the last glacial period.
<u>Calaminarian grasslands of the Violetalia calaminariae</u></td></tr>
</table>

	This site contains an example of Calaminarian grassland on lead-mine spoil associated with the Carboniferous limestone at high altitude in the Pennines of northern England. Much of the spoil is unvegetated and has a variety of particle sizes ranging from coarse rubble to fine sediment, and several steep, unstable slopes. The metallophytes spring sandwort *Minuartia verna*, alpine penny-cress *Thlaspi caerulescens* and Pyrenean scurvygrass *Cochlearia pyrenaica* occur along with lichens such as *Cladonia rangiformis*, *C. chlorophaea* and *Coelocaulon aculeatum*. **Siliceous alpine and boreal grasslands** The summit of Cross Fell has the best-developed and most extensive area of Siliceous alpine and boreal grasslands in England. The U10 *Carex bigelowii – Racomitrium lanuginosum* moss-heath that covers the summit cap has a high cover of woolly fringe-moss *Racomitrium lanuginosum*. **Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)** Extensive stands of CG9 *Sesleria albicans – Galium sterneri* grassland occur at this site in northern England. It is an important variant of this community since it contains a rich assemblage of relict arctic-alpine species, such as spring gentian *Gentiana verna* and alpine forget-me-not *Myosotis alpestris*, making Moor House – Upper Teesdale one of the most important arctic-alpine refugia in the UK. The grasslands are for the most part heavily grazed but show transitions to a wide range of other vegetation types, including 7130 Blanket bogs, acid grassland, 7230 Alkaline fens, 6520 Mountain hay meadows, 8240 Limestone pavements, cliffs and 8120 calcareous and calcshist screes of the montane to alpine levels. **Molinia meadows on calcareous, peaty or clayey-silt-laden soils (Molinion caeruleae)** This is one of three sites representing M26 *Molinia caerulea – Crepis paludosa* mire in northern England. Although less extensive and more fragmentary than at Craven Limestone Complex, stands occur in a wider range of ecological contexts, including examples within 6520 Mountain hay meadows (which are not found in other sites), as well as examples in lightly grazed pasture, on wet margins of woodland and on stream banks. **Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels** Moor House – Upper Teesdale comprises an area of mixed geology made up of carboniferous sandstones, mudstone and limestones. The combination of acidic and base-rich soil has given rise to an important range of vegetation types that has also been influenced by climatic conditions on this, the highest part of the Pennines. Hydrophilous tall herb fringe communities occur on wet ledges in base-rich rocks, which are inaccessible to grazing livestock. One of the most extensive stands is on a tributary of Little Gill, and examples also occur at Lady Gill, Greencastle, High Cup Nick and Mickle Fell. Typical species that occur in these localities include great wood-rush *Luzula sylvatica*, wood crane's-bill *Geranium sylvaticum*, water avens *Geum rivale*, lady's-mantle *Alchemilla glabra*, wild angelica *Angelica sylvestris* and roseroot *Sedum rosea*. **Mountain hay meadows**

Upper Teesdale contains actively-managed Mountain hay meadows at their highest altitude in the UK. Though representing a smaller proportion of the national resource than the North Pennine Dales Meadows, the meadows of this site have been managed at an extremely low level of agricultural intensification and show good conservation of habitat structure and function. There are important populations of an extensive suite of hay meadows species, including several rare species of lady's-mantle (*Alchemilla acutiloba*, *A. monticola* and *A. subcrenata*) and abundant globeflower *Trollius europaeus*

Blanket bogs (* if active bog) * Priority feature

This site in the northern Pennines represents Blanket bogs in the north of England. The site includes the least damaged and most extensive tracts of typical M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire in England and shows this community type up to its highest altitude in England. This large expanse of peat displays the full range of features typical of the Pennines, with extensive erosion, mainly on higher areas, interspersed with large swathes of bog dominated by heather *Calluna vulgaris* or cottongrasses *Eriophorum* spp. A few areas display small-scale surface patterning, with distinct *Sphagnum* hollows and intervening ridges. Some parts of the site show characteristics of the western-type Scottish Blanket bogs, whereas the lichen-rich areas are a feature of bogs in Fennoscandia.

Petrifying springs with tufa formation (Cratoneurion) * Priority feature

This is one of three sites in northern England that have extensive series of petrifying springs with tufa formation. At this site Carboniferous limestones are thinly-bedded amidst shales, sandstones and slates. Tufa springs often occur at the junction between limestone and these other, less permeable, rocks at a range of altitudes. Tufa springs are associated with calcareous glacial drift and can be found in calcareous grasslands, in fen systems of grazed pastures, associated with limestone scar cliffs and screes and amidst acid heathland and grassland. The flora is exceptionally rich and includes rare northern species such as bird's-eye primrose *Primula farinosa* and Scottish asphodel *Tofieldia pusilla*.

Alkaline fens

This is one of two upland sites in northern England selected for Alkaline fens. Spring-fed flush fens of NVC type M10 *Carex dioica – Pinguicula vulgaris* mire are widespread on the moors amidst calcareous grassland, limestone scars, heath and bog, in enclosed pastures amidst a range of acid and calcareous grasslands and in meadows, often as part of complex vegetation mosaics. The site has an exceptionally important rare plant flora associated with flush vegetation, including species such as bird's-eye primrose *Primula farinosa* and Scottish asphodel *Tofieldia pusilla*. On the highest and coldest parts of the site fen grades into Annex I type 7240 Alpine pioneer formations of the *Caricion bicoloris-atrofuscae*, and intermediate examples occur.

Alpine pioneer formations of the Caricion bicoloris-atrofuscae * Priority feature

This site in northern England is the largest and most diverse example of Alpine pioneer formations of the *Caricion bicoloris-atrofuscae* south of the Highlands. It is a southern outlier with an extensive area of the habitat type, and is a southern outpost for many of the rarer arctic-alpine plants characteristic of this habitat type, with a unique relict mountain flora. Teesdale sandwort *Minuartia stricta* is restricted to Upper Teesdale, and other rare species found in this habitat type include false sedge *Kobresia simpliciuscula*, hair sedge *Carex capillaris* and Scottish

asphodel *Tofieldia pusilla*. The NVC types represented are M10 *Carex dioica – Pinguicula vulgaris* mire and M11 *Carex demissa – Saxifraga aizoides* mire.

Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)

Moor House – Upper Teesdale is representative of communities on both low and high altitude siliceous scree in northern England. Screes are extensive, with diverse plant communities. Cross Fell is a southern outlier of high-altitude gritstone scree, with a flora including rare lichens and some widespread montane vascular plants. Ferns including parsley fern *Cryptogramma crispa* and holly fern *Polystichum lonchitis* occur on extensive whin-sill screes at lower altitudes.

Calcareous and calcshist screes of the montane to alpine levels (Thlaspietea rotundifolii)

This site is representative of the communities of calcareous and calcshist screes in the north of England up to an altitude of 760 m. This site has the most extensive areas of calcareous and calcshist scree in the UK, consisting of Carboniferous limestone. Communities are diverse and there is a mix of northern and southern floristic elements, including holly-fern *Polystichum lonchitis*, rigid buckler-fern *Dryopteris submontana*, limestone fern *Gymnocarpium robertianum*, musk thistle *Carduus nutans* and mossy saxifrage *Saxifraga hypnoides*. Hairy stonecrop *Sedum villosum* occurs where scree is flushed by springs.

Calcareous rocky slopes with chasmophytic vegetation

This is one of three sites representing Calcareous rocky slopes with chasmophytic vegetation in the north of England. Crevice communities occur on extensive limestone scars, especially along the Pennine escarpment and around the summits of hills. Cliff crevice vegetation occurs extensively and to an altitude of 760 m. The most extensive community present is characterised by green spleenwort *Asplenium viride* and brittle bladder-fern *Cystopteris fragilis*. Less common species found in this community include hoary whitlowgrass *Draba incana*, alpine cinquefoil *Potentilla crantzii* and holly-fern *Polystichum lonchitis*. The site is also of interest for its combination of southern and northern flora. Rarer southern species include bird's-foot sedge *Carex ornithopoda* and horseshoe vetch *Hippocrepis comosa*. The whitebeam *Sorbus rupicola*, which is widely distributed but found at only a few sites, is also present.

Siliceous rocky slopes with chasmophytic vegetation

Moor House – Upper Teesdale, which includes the highest point of the Pennines, has a mixed geology of Carboniferous sandstones, mudstone and limestones, that have influenced the important plant communities that are found there. This cSAC is one of only a very few sites in England supporting Siliceous rocky slopes with chasmophytic vegetation. The most extensive occurrences of this community type are where the Whin Sill outcrops at Falcon Clints, Ravenscar, Holwick Scars and High Force. Some examples also occur at Middle Tongue and alongside Cash Burn. Characteristic species present include parsley fern *Cryptogramma crispa*, mountain male-fern *Dryopteris oreades* and northern buckler-fern *D. expansa*. Bearberry *Arctostaphylos uva-ursi* and starry saxifrage *Saxifraga stellaris* also occur in this community.

Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

European dry heaths

Limestone pavements * Priority feature

Annex II species that are a primary reason for selection

Round-mouthed whorl snail *Vertigo genesii*

In Upper Teesdale round-mouthed whorl snail *Vertigo genesii* lives amongst moss, low-growing sedges and a rich assemblage of rare and local arctic-alpine plants such as bird's-eye primrose *Primula farinosa* and Scottish asphodel *Tofieldia pusilla*. *V. genesii* is found at a number of base-rich flushes around the slopes of Widdybank Fell and at isolated flushes further east on Cronkley Fell and Holwick Fell, at altitudes between 400 m and 525 m. The snail is locally abundant at some flushes and dominates the molluscan fauna at many of them.

Marsh saxifrage *Saxifraga hirculus*

This very large site in northern England is the most important site for marsh saxifrage *Saxifraga hirculus* in the UK. The site consists of an extensive upland complex on limestone and gritstone, with acid grassland, blanket mire, limestone outcrops and flushes. Drainage water in many of the flushes is influenced by the underlying geology – Upper Carboniferous mudstones and shales within more extensive limestone. Approximately ten of the flush areas support populations of marsh saxifrage, including areas in the Appleby Fells, Cross Fell and Upper Teesdale, containing a total of over 270,000 plants – >90% of the UK population. In this area distributions are very patchy within flushes so that population estimates are hard to support, but individual populations in these localities can be large, with several localities supporting thriving populations of many thousands of plants. In 1999 the largest population was estimated at 153,100 individuals.

Annex II species present as a qualifying feature, but not a primary reason for site selection

NA

Negative impacts	Positive impacts
A02 - Modification of cultivation practices	A02 - Modification of cultivation practices
J01 - Fire and fire suppression	B02 - Forest and Plantation management & use
K04 - Interspecific floral relations	B06 - Grazing in forests/ woodland
A04 - Grazing	D05 - Improved access to site
K05 - Reduced fecundity/ genetic depression	A03 - Mowing / cutting of grassland
	A06 - Annual and perennial non-timber crops

		A04 - Grazing
Berwickshire & North Northumberland Coast (includes marine components)	Annex I habitats that are a primary reason for selection **Mudflats and sandflats not covered by seawater at low tide** This is an extensive and diverse stretch of coastline in north-east England and south-east Scotland. There is variation in the distribution of features of interest along the coast. Stretches of the coast in England support a very extensive range of intertidal mudflats and sandflats, ranging from wave-exposed beaches to sheltered muddy flats with rich infaunal communities. These have been selected as biologically diverse and extensive examples of clean sandflats on the east coast. Those in the Lindisfarne and Budle Bay area and on the adjacent open coast flats north of Holy Island are the most extensive in north-east England, with the largest intertidal beds of narrow-leaved eelgrass *Zostera angustifolia* and dwarf eelgrass *Z. noltei* on the east coast of England, a diverse infauna, and some large beds of mussels *Mytilus edulis*. Some of the bays along the open coast have mobile sediments, with populations of sand-eels *Ammodytes* sp., small crustaceans and polychaete worms. More sheltered sediments have very stable lower shore communities of burrowing heart-urchins *Echinocardium cordatum* and bivalve molluscs. **Large shallow inlets and bays** Whilst predominantly rocky, this extensive and diverse stretch of coastline has several characteristic, sediment-dominated embayments in north-east England, including Budle Bay, Beadnell Bay and Embleton Bay. Each of these areas is relatively exposed and uniform in nature and is characterised by crustacean /polychaete- and bivalve/polychaete-biotopes. Budle Bay is adjacent and continuous with the bay to the north between the island of Lindisfarne and the mainland. This area forms one of the most extensive areas of sandflats between the Firth of Forth and the Wash, and these are some of the richest examples of these biotopes in north-east England. In the sublittoral, Beadnell and Embleton Bays form a sandy break in the otherwise continuous reef habitat in this site. These areas are characterised by extensive areas of clean sand with often dense populations of the heart urchin *Echinocardium cordatum*, and razor clams *Ensis siliqua* and *E. arcuatus*. **Reefs** This site is an extensive and diverse stretch of coastline in north-east England and south-east Scotland. Moderately wave-exposed reef habitats occur throughout the site. The subtidal rocky reefs and their rich marine communities, together with the wide variety of associated littoral reefs, are the most diverse known on the North Sea coast. Their remarkably varied nature is due to the wide range of physical conditions in the area, from wave-exposed locations on the open coast, through more sheltered reefs within bays, to those exposed to strong tidal streams in sounds and off headlands. There is also a diverse range of rock types, including soft limestones and hard volcanic rock. The Farne Islands are of special importance as they are among the very few rocky islands with extensive reefs in the enclosed North Sea. A large number of the species present are characteristic of cold water and several reach their southern or eastern limit of distribution within the area. **Submerged or partially submerged sea caves**	

<table>
<tr><td></td><td>This is an extensive and diverse stretch of coastline in north-east England and south-east Scotland. Caves occur throughout the site in both the intertidal and the subtidal zones in a range of different hard rock exposures. There are examples of partially submerged caves in the cliffs north of Berwick and in the limestone at Howick (south of Craster), and there are submerged sea caves, tunnels and arches in the volcanic rock of the Farne Islands and around St Abb's Head. Caves occur in association with 1170 Reefs, in both the intertidal and the subtidal zones. Depending on the depth of the cave and its morphology, the site supports a range of distinct biological communities.</td></tr>
<tr><td></td><td>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA</td></tr>
<tr><td></td><td>Annex II species that are a primary reason for selection

<u>Grey seal</u> Halichoerus grypus

This is an extensive and diverse stretch of coastline in north-east England and south-east Scotland. There is variation in the distribution of features of interest along the coast. The north-east England coastal section is representative of grey seal Halichoerus grypus breeding colonies in the south-east of its breeding range in the UK. It is the most south-easterly site selected for this species, and supports around 2.5% of annual UK pup production.</td></tr>
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</table></td></tr>
<tr><td>North Northumberland Dunes</td><td>Annex I habitats that are a primary reason for selection

<u>Embryonic shifting dunes</u></td></tr>
</table>

	North Northumberland Dunes represents Embryonic shifting dunes in north-east England. The embryonic shifting dune vegetation of this long series of dunes is both extensive and varied. There are examples of all the main embryonic dune communities. Lyme-grass *Leymus arenarius* communities are particularly strongly represented, but sand couch *Elytrigia juncea* communities and strandline species are also present. **"Shifting dunes along the shoreline with Ammophila arenaria (""white dunes"")"** This site consists of a number of dune systems on the north-east coast of England, most of which are accreting and forming suitable conditions for the development of shifting dunes with *Ammophila arenaria*. Lyme-grass *Leymus arenarius* is a characteristic species in this habitat type in north-east England, often as an important component. Climbing dunes can occur on steep rocky coasts, as found at Bamburgh. Some of the dune systems support a number of uncommon dune plants, some of which are at the limit of their distribution in the UK. **"Fixed coastal dunes with herbaceous vegetation (""grey dunes"")"** * Priority feature North Northumberland Dunes represents fixed dunes with herbaceous vegetation in north-east England. It is an active site with extensive calcareous fixed dunes locally grading into more acidic fixed dune vegetation and dune heath. The site has been selected particularly as a representative of the north-eastern variant, in which bloody crane's-bill *Geranium sanguineum* is prominent. **Dunes with Salix repens ssp. argentea (Salicion arenariae)** The dunes of Holy Island and Ross Links are calcareous and represent dunes with *Salix repens* ssp. *argentea* on the north-east coast of England. Creeping willow *Salix repens* ssp. *argentea* dominates the more mature dune slacks and a number of rare plant species are associated with this type of vegetation. The mature slacks contribute to the wide range of habitats found on this site and form part of a well-developed successional series. **Humid dune slacks** North Northumberland Dunes represents a rare example of well-developed dune slack vegetation on the east coast of England. Holy Island contains a number of calcareous, species-rich dune slacks, which support a number of rare species, such as coralroot *Corallorhiza trifida*, dune helleborine *Epipactis leptochila* var. *dunensis* and seaside centaury *Centaurium littorale*. Active slack formation is continuing at this site and a range of successional stages are present. The humid dune slacks of nearby Ross Links contain vegetation typical of more base-poor

<table>
<tr><td></td><td colspan="2">conditions. The site as a whole therefore contains an exceptional range of humid dune slack types, including 40 ha of the full range of slack vegetation types characterised by common sedge Carex nigra.</td></tr>
<tr><td></td><td colspan="2">Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site
NA</td></tr>
<tr><td></td><td colspan="2">Annex II species that are a primary reason for selection
<u>Petalwort</u> Petalophyllum ralfsii

This site represents petalwort Petalophyllum ralfsii in north-east England. There are extensive dune systems with slacks here, both on the mainland and on Holy Island. Petalwort has been recorded from Holy Island and from two locations on the mainland.</td></tr>
<tr><td></td><td colspan="2">Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td>Negative impacts</td><td>Positive impacts</td></tr>
<tr><td></td><td>G01 - Outdoor sports and leisure activities, recreational activities</td><td>A04 - Grazing</td></tr>
<tr><td></td><td>H01 - Pollution to surface waters (limnic & terrestrial, marine & brackish)</td><td>A02 - Modification of cultivation practices</td></tr>
<tr><td></td><td>I01 - Invasive non-native species</td><td></td></tr>
<tr><td></td><td>K03 - Interspecific faunal relations</td><td></td></tr>
<tr><td></td><td>M02 - Changes in biotic conditions</td><td></td></tr>
<tr><td>North York Moors</td><td colspan="2">Annex I habitats that are a primary reason for selection

<u>Northern Atlantic wet heaths with Erica tetralix</u>
This site in north-east Yorkshire within the North York Moors National Park contains the largest continuous tract of upland heather moorland in England. M16 Erica tetralix – Sphagnum compactum wet heath is the second most extensive vegetation type on the site and is predominantly found on the eastern and northern moors where the soil is less free-draining. Purple moor-grass Molinia caerulea and heath rush Juncus squarrosus are also common within this community. In the wettest stands bog-mosses, including Sphagnum tenellum, occur, and the nationally scarce creeping forget-me-not Myosotis stolonifera can be found in acid moorland streams and shallow pools.
<u>European dry heaths</u>
This site in north-east Yorkshire within the North York Moors National Park contains the largest continuous tract of upland heather moorland in England. Dry heath covers over half the site and forms the main vegetation type on the western, southern and central moors where the soil is free-draining and has only a thin peat layer. The principal NVC type present is H9 Calluna vulgaris – Deschampsia flexuosa, with some</td></tr>
</table>

<table>
<tr><td></td><td>H10 Calluna vulgaris – Erica cinerea heath on well-drained areas throughout the site, and large areas of H12 Calluna vulgaris – Vaccinium myrtillus heath on steeper slopes.</td></tr>
<tr><td></td><td>Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site

<u>Blanket bogs (* if active bog)</u> * Priority feature</td></tr>
<tr><td></td><td>Annex II species that are a primary reason for selection
NA</td></tr>
<tr><td></td><td>Annex II species present as a qualifying feature, but not a primary reason for site selection
NA</td></tr>
<tr><td></td><td><table>
<tr><td>Negative impacts</td><td>Positive impacts</td></tr>
<tr><td>K04 - Interspecific floral relations</td><td>B02 - Forest and Plantation management & use</td></tr>
<tr><td>I01 - Invasive non-native species</td><td>A02 - Modification of cultivation practices</td></tr>
<tr><td>H04 - Air pollution, air-borne pollutants</td><td>A04 - Grazing</td></tr>
<tr><td>J01 - Fire and fire suppression</td><td>B06 - Grazing in forests/ woodland</td></tr>
<tr><td>M01 - Changes in abiotic conditions</td><td>A03 - Mowing / cutting of grassland</td></tr>
</table></td></tr>
<tr><td>North Pennine Moors</td><td>Annex I habitats that are a primary reason for selection

<u>European dry heaths</u>

The North Pennine Moors (along with the North York Moors) hold much of the upland heathland of northern England. At higher altitudes and to the wetter west and north of the site complex, the heaths grade into extensive areas of 7130 blanket bogs. The most abundant heath communities are H9 Calluna vulgaris – Deschampsia flexuosa heath and H12 Calluna vulgaris – Vaccinium myrtillus heath. There are also examples of H18 Vaccinium myrtillus – Deschampsia flexuosa, H10 Calluna vulgaris – Erica cinerea and H21 Calluna vulgaris – Vaccinium myrtillus – Sphagnum capillifolium heaths.
<u>Juniperus communis formations on heaths or calcareous grasslands</u>

The North Pennine Moors includes one major stand of juniper scrub in Swaledale as well as a number of small and isolated localities. The Swaledale site grades into heathland and bracken Pteridium aquilinum but the core area of juniper is of W19 Juniperus communis – Oxalis acetosella woodland with scattered rowan Sorbus aucuparia and birch Betula spp.</td></tr>
</table>

	Blanket bogs (* if active bog) * Priority feature The North Pennine Moors hold the major area of blanket bog in England. A significant proportion remains active with accumulating peat, although these areas are often bounded by sizeable zones of currently non-active bog, albeit on deep peat. The main NVC type is M19 *Calluna vulgaris – Eriophorum vaginatum* blanket mire, but there is also representation of M18 *Erica tetralix – Sphagnum papillosum* blanket mire and some western localities support M17 *Scirpus cespitosus – Eriophorum vaginatum* blanket mire. Forms of M20 *Eriophorum vaginatum* blanket mire predominate on many areas of non-active bog. **Petrifying springs with tufa formation (Cratoneurion)** * Priority feature The petrifying springs habitat is very localised in occurrence within the North Pennine Moors, but where it does occur it is species-rich with abundant bryophytes, sedges and herbs including bird's-eye primrose *Primula farinosa* and marsh valerian *Valeriana dioica*. **Siliceous rocky slopes with chasmophytic vegetation** Acidic rock outcrops and screes are well-scattered across the North Pennine Moors and support vegetation typical of Siliceous rocky slopes with chasmophytic vegetation in England, including a range of lichens and bryophytes, such as *Racomitrium lanuginosum*, and species like stiff sedge *Carex bigelowii* and fir clubmoss *Huperzia selago*. **Old sessile oak woods with Ilex and Blechnum in the British Isles** Birk Gill Wood is an example of old sessile oak woods well to the east of the habitat's main distribution in the UK. However, this sheltered river valley shows the characteristic rich bryophyte and lichen communities of the type under a canopy of oak, birch *Betula* sp. and rowan *Sorbus aucuparia*. The slopes are boulder-strewn, with mixtures of heather *Calluna vulgaris*, bilberry *Vaccinium myrtillus* and moss carpets in the ground flora.
	Annex I habitats present as a qualifying feature, but not a primary reason for selection of this site **Northern Atlantic wet heaths with Erica tetralix**

	Calaminarian grasslands of the Violetalia calaminariae **Siliceous alpine and boreal grasslands** **Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)** **Alkaline fens** **Siliceous scree of the montane to snow levels (Androsacetalia alpinae and Galeopsietalia ladani)** **Calcareous rocky slopes with chasmophytic vegetation**	
	Annex II species that are a primary reason for selection NA	
	Annex II species present as a qualifying feature, but not a primary reason for site selection **Marsh saxifrage** *Saxifraga hirculus*	
	Negative impacts	Positive impacts
	K04 - Interspecific floral relations	B02 - Forest and Plantation management & use
	J01 - Fire and fire suppression	D05 - Improved access to site
	J02 - Human induced changes in hydraulic conditions	A02 - Modification of cultivation practices
	A04 - Grazing	A03 - Mowing / cutting of grassland
	A02 - Modification of cultivation practices	G03 - Interpretative centres
		B06 - Grazing in forests/ woodland
		A06 - Annual and perennial non-timber crops
		A04 - Grazing

SPA/RAMSAR	Reason for SPA designation	Reason for Ramsar designation

Teesmouth & Cleveland Coast (includes marine components)	**Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC** **Knot** *Calidris canutus* **Ruff** *Philomachus pugnax* **Avocet** *Recurvirostra avosetta* **Little Tern** *Sterna albifrons* **Common Tern** *Sterna hirundo* **Redshank** *Tringa totanus* During the breeding season, the site regularly supports: *Recurvirostra avosetta* 1.2% of the GB population 5 year peak mean, 2010 – 2014 *Sterna hirundo* 4.0% of the GB population 5 year peak mean, 2010 – 2014 *Sternula albifrons* 4.3% of the GB population 5 year peak mean, 2010 – 2014. On passage the area regularly supports: *Thalasseus sandvicensis* (Western Europe/Western Africa) 6.8% of the GB population 5 year peak mean, 1988 – 1992 *Caldris pugnax* 2.4% of the GB population 5 year peak mean, 2011/12 – 2015/16. ARTICLE 4.2 QUALIFICATION (79/409/EEC) Over winter the area regularly supports: *Calidris canutus* (North-eastern Canada/Greenland/Iceland/North-western Europe) 1.6% of the population 5 year peak mean for 1991/92 – 1995/96. On passage the area regularly supports: Trin*ga totanus* (Eastern Atlantic - wintering) 1.1% of the East Atlantic Flyway population 5 year peak mean, 1987 – 1991. **Other important species of flora and fauna** **Waterbird assemblage** ARTICLE 4.2 QUALIFICATION (79/409/EEC): AN INTERNATIONALLY IMPORTANT ASSEMBLAGE OF BIRDS Over winter the area regularly supports: 26,014 waterbirds 5 year peak mean, 2011/12 – 2015/16 Including: Mareca strepera, Spatula clypeata, Calidris alba, Mareca penelope, Vanellus vanellus, Larus argentatus and Chroicocephalus ridibundus.	**Reason for designation** **Internationally important numbers of waterbirds** Species with peak counts in winter: 9528 waterfowl (5 year peak mean 1998/99-2002/2003 **Qualifying Species/populations (as identified at designation) - Species/populations occurring at levels of international importance** Species with peak counts in spring/autumn: **Common redshank** *Tringa totanus totanus* 883 individuals, representing an average of 0.7% of the GB population (5 year peak mean 1998/9- 2002/3) Species with peak counts in winter: **Red knot** *Calidris canutus islandica* 2579 individuals, representing an average of 0.9% of the GB population (5 year peak mean 1998/9-2002/3) **Noteworthy flora and fauna** **Flora** *Festuca arenaria, Puccinellia rupestris, Ranunculus baudotii* (all Nationally Scarce) **Fauna** Species currently occurring at levels of national importance Species regularly supported during the breeding season: Little tern *Sterna albifrons albifrons* 40 pairs, representing an average of 2% of the GB population (Five year mean for 1995 to 1998) Species with peak counts in spring/autumn: Northern shoveler *Anas clypeata* 7 individuals, representing an average of 0% of the GB population (5 year peak mean 1998/9- 2002/3) Common greenshank *Tringa nebularia* 7 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9- 2002/3)

<table>
<tr><td></td><td colspan="2"></td><td colspan="2">Invertebrates: Pherbellia grisescens, Thereva valida, Longitarsus nigerrimus, Dryops nitidulus, Macroplea mutica, Philonthus dimidiatipennis, Trichohydnobius suturalis (all RDB)</td></tr>
<tr><td></td><td>Negative impacts</td><td>Impact strength</td><td>Positive impacts</td><td>Impact strength</td></tr>
<tr><td></td><td>E01 - Urbanised areas, human habitation</td><td>L</td><td></td><td></td></tr>
<tr><td></td><td>G01 - Outdoor sports and leisure activities, recreational activities</td><td>H</td><td></td><td></td></tr>
<tr><td></td><td>D01 - Roads, paths and railroads</td><td>L</td><td></td><td></td></tr>
<tr><td></td><td>C03 - Renewable abiotic energy use</td><td>L</td><td></td><td></td></tr>
<tr><td></td><td>F06 - Hunting, fishing or collecting activities not referred to above</td><td>M</td><td></td><td></td></tr>
<tr><td></td><td>J03 - Other ecosystem modifications</td><td>L</td><td></td><td></td></tr>
<tr><td></td><td>I01 - Invasive non-native species</td><td>M</td><td></td><td></td></tr>
<tr><td></td><td>M02 - Changes in biotic conditions</td><td>L</td><td></td><td></td></tr>
<tr><td></td><td>H04 - Air pollution, air-borne pollutants</td><td>L</td><td></td><td></td></tr>
<tr><td></td><td>H07 - Other forms of pollution</td><td>L</td><td></td><td></td></tr>
<tr><td></td><td>F05 - Illegal taking/ removal of marine fauna</td><td>L</td><td></td><td></td></tr>
<tr><td></td><td>H03 - Marine water pollution</td><td>M</td><td></td><td></td></tr>
<tr><td></td><td>D03 - Shipping lanes, ports, marine constructions</td><td>H</td><td></td><td></td></tr>
<tr><td></td><td>G05 - Other human intrusions and disturbances</td><td>L</td><td></td><td></td></tr>
<tr><td></td><td>M01 - Changes in abiotic conditions</td><td>L</td><td></td><td></td></tr>
<tr><td>Holburn Lake & Moss</td><td colspan="2">Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC

Greylag goose Anser asner

Over winter the area regularly supports: Anser anser [Iceland/UK/Ireland] 2.2% of the population 5 year peak mean 1991/92-1995/96</td><td colspan="2">Reason for designation

The site is an important winter roost site for greylag geese, of which the entire Icelandic race winters in Britain. Peak counts in winter: 2150 individuals, representing an average of 2.4% of the population (Source period not collated)

Regularly visited by large flocks of mallard Anas platyrhynchos, wigeon Anas penelope and teal Anas crecca, provides an inland roost for coastal wildfowl during unfavourable weather conditions. A few pairs of shelduck Tadorna tadorna, shoveler Anas clypeata and tufted duck Aythya fuligula regularly breed here.
Noteworthy flora and fauna

Species currently occurring at levels of national importance with peak counts in spring/autumn: Eurasian teal Anas crecca, NW Europe 2013 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9- 2002/3)</td></tr>
</table>

	Negative impacts	Impact strength	Positive impacts	Impact strength
	I01 - Invasive non-native species	H	G03 - Interpretative centres	H
	G05 - Other human intrusions and disturbances	H	D05 - Improved access to site	H
	G01 - Outdoor sports and leisure activities, recreational activities	H		
	K03 - Interspecific faunal relations	H		
	M02 - Changes in biotic conditions	H		
Coquet Island (includes marine components)	**Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC** **Roseate Tern** *Sterna dougallii* **Common Tern** *Sterna hirundo* **Arctic Tern** *Sterna paradisaea* **Sandwich Tern** *Sterna sandvicensis* During the breeding season the area regularly supports: *Sterna dougallii* (Europe - breeding) 93.02% of the GB breeding population 5 year peak mean (2010-2014); *Sterna hirundo* (Northern/Eastern Europe - breeding) 11.89% of the GB breeding population over a 5 year peak mean (2010-2014); *Sterna paradisaea* (Arctic - breeding/Southern Oceans - wintering) 2.32% of the GB breeding population over a five year peak mean (2010-2014); *Sterna sandvicensis* (Western Europe/Western Africa) 11.82% of the GB breeding population over a 5 year peak mean (2010-2014). **Other important species of flora and fauna** **Seabird assemblage** ARTICLE 4.2 QUALIFICATION (2009/147/EC): An internationally important assemblage of seabirds. In the breeding season the area regularly supports 47,662 individuals (5 year peak mean 2010-2014) including the 4 species listed above plus: *Fratercula arxtica, Chroicocephalus ridibundus* as main components of the assemblage.		NA	
	Negative impacts	Impact strength	Positive impacts	Impact strength

	I01 - Invasive non-native species	H	G03 - Interpretative centres	H
	G05 - Other human intrusions and disturbances	H	D05 - Improved access to site	H
	G01 - Outdoor sports and leisure activities, recreational activities	H		
	K03 - Interspecific faunal relations	H		
	M02 - Changes in biotic conditions	H		
Lindisfarne (includes marine components)	**Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC** **Wigeon** *Anas penelope* **Greylag goose** *Anser anser* **Pale-bellied Brent goose** *Branta bernicla hrota* **Sanderling** *Calidris alba* **Dunlin** *Calidris alpina alpina* **Ringed Plover** *Charadrius hiaticula* **Long-tailed Duck** *Clangula hyemalis* **Whooper Swan** *Cygnus cygnus* **Bar-tailed Godwit** *Limosa lapponica* **Common Scoter** *Melanitta nigra* **Red-breasted Merganser** *Mergus serrator* **Golden Plover** *Pluvialis apricaria* **Grey Plover** *Pluvialis squatarola* **Eider** *Somateria mollissima* **Little Tern** *Sterna albifrons* **Roseate Tern** *Sterna dougallii* **Shelduck** *Tadorna tadorna* ***Redshank*** *Tringa totanus* During the breeding season the area regularly supports: *Sterna albifrons* (Eastern Atlantic - breeding) 0.6% of the GB breeding population 5 year mean, 1992-1996 *Sterna dougallii* (Europe - breeding) at least % of the GB breeding population Count, as at late 1990s Over winter the area regularly supports: *Cygnus cygnus* (Iceland/UK/Ireland) 0.9% of the GB population 5 year peak mean 1991/92-1995/96 *Limosa lapponica* (Western Palearctic - wintering) 5.6% of the GB population 5 year peak mean 1991/92-1995/96 *Pluvialis apricaria* [North-western Europe - breeding] 2.1% of the GB population 5 year peak mean 1991/92-1995/96 Over winter the area regularly supports: *Anas penelope* (Western Siberia/North-western/North-eastern Europe) 0.6% of the population 5 year peak mean 1991/92-1995/96 *Anser anser*		**Reason for designation** **Assemblages of international importance:** Species with peak counts in winter: 44970 waterfowl (5 year peak mean 1998/99-2002/2003) **Species/populations occurring at levels of international importance:** Qualifying Species/populations (as identified at designation) Species with peak counts in spring/autumn: **Light-bellied brent goose** *Branta bernicla hrota* 2799 individuals, representing an average of 55.9% of the population (5 year peak mean 1998/9-2002/3) **Eurasian wigeon** *Anas penelope* 10857 individuals, representing an average of 2.6% of the GB population (5 year peak mean 1998/9-2002/3) **Ringed plover** *Charadrius hiaticula* 114 individuals, representing an average of 0.3% of the GB population (5 year peak mean 1998/9- 2002/3 - spring peak) **Common redshank** *Tringa totanus tetanus* 1572 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9-2002/3) Species with peak counts in winter: **Greylag goose** *Anser anser anser* 750 individuals, representing an average of 0.9% of the GB population (5 year peak mean for 1995/6-1999/2000) **Bar-tailed godwit** *Limosa lapponica lapponica* 3757 individuals, representing an average of 3.1% of the population (5 year peak mean 1998/9-2002/3)	

	[Iceland/UK/Ireland] 1.4% of the population 5 year peak mean 1991/92-1995/96 *Branta bernicla* hrota [Svalbard/Denmark/UK] 36.9% of the population 5 year peak mean 1991/92-1995/96 *Calidris alba* (Eastern Atlantic/Western & Southern Africa - wintering) 0.9% of the population in Great Britain 5 year peak mean 1991/92-1995/96 *Calidris alpina alpina* (Northern Siberia/Europe/Western Africa) 1.4% of the population in Great Britain 5 year peak mean 1991/92-1995/96 *Charadrius hiaticula* (Europe/Northern Africa - wintering) 0.3% of the population 5 year peak mean 1991/92-1995/96 *Clangula hyemalis* (Iceland/Greenland) 0.3% of the population in Great Britain 5 year peak mean 1991/92-1995/96 *Mergus serrator* (North-western/Central Europe) 0.2% of the population in Great Britain 5 year peak mean 1991/92-1995/96 *Pluvialis squatarola* (Eastern Atlantic - wintering) 3.6% of the population in Great Britain 5 year peak mean 1991/92-1995/96 *Somateria mollissima* (Britain/Ireland) 2% of the population in Great Britain 5 year peak mean 1991/92-1995/96 *Tadorna tadorna* (North-western Europe) 1.2% of the population in Great Britain 5 year peak mean 1991/92-1995/96	Species/populations identified subsequent to designation for possible future consideration under criterion 6. Species with peak counts in spring/autumn: **Pink-footed goose** *Anser brachyrhynchus* 2531 individuals, representing an average of 1% of the population (5 year peak mean 1998/9- 2002/3) **Noteworthy flora and fauna** Lower Plants: **Petalwort** *Petalophyllum ralfsii* (Habitats Directive Annex II species) Higher plants **Dune helleborine** *Epipactis sancta* (endemic on Holy Island) Species currently occurring at levels of national importance: Species with peak counts in spring/autumn: **Black (common) scoter** *Melanitta nigra nigra* 547 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9- 2002/3 - spring peak) **European golden plover** *Pluvialis apricaria apricaria* 3322 individuals, representing an average of 1.3% of the GB population (5 year peak mean 1998/9- 2002/3) **Grey plover** *Pluvialis squatarola* 1261 individuals, representing an average of 2.3% of the GB population (5 year peak mean 1998/9- 2002/3) **Ruff** *Philomachus pugnax* 11 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9- 2002/3) **Eurasian curlew** *Numenius arquata arquata* 1507 individuals, representing an average of 1% of the GB population (5 year peak mean 1998/9- 2002/3) **Common greenshank** *Tringa nebularia* 10 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9- 2002/3)

<table>
<tr><td></td><td colspan="2"></td><td colspan="2">Species with peak counts in winter:
Slavonian grebe Podiceps auratus
9 individuals, representing an average of 1.2% of the GB population (5 year peak mean 1998/9- 2002/3)

Common shelduck Tadorna tadorna
1455 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9- 2002/3)

Common eider Somateria mollissima mollissima
1241 individuals, representing an average of 1.7% of the GB population (5 year peak mean 1998/9- 2002/3)

Red knot Calidris canutus islandica
3532 individuals, representing an average of 1.2% of the GB population (5 year peak mean 1998/9- 2002/3)

Dunlin Calidris alpina alpina
8649 individuals, representing an average of 1.5% of the GB population (5 year peak mean 1998/9- 2002/3)</td></tr>
<tr><td></td><td>Negative impacts</td><td>Impact strength</td><td>Positive impacts</td><td>Impact strength</td></tr>
<tr><td></td><td>H01 - Pollution to surface waters (limnic & terrestrial, marine & brackish)</td><td>H</td><td>A04 - Grazing</td><td>H</td></tr>
<tr><td></td><td>I01 - Invasive non-native species</td><td>H</td><td>A02 - Modification of cultivation practices</td><td>H</td></tr>
<tr><td></td><td>M02 - Changes in biotic conditions</td><td>H</td><td>D05 - Improved access to site</td><td>H</td></tr>
<tr><td></td><td>K03 - Interspecific faunal relations</td><td>H</td><td></td><td></td></tr>
<tr><td></td><td>G01 - Outdoor sports and leisure activities, recreational activities</td><td>H</td><td></td><td></td></tr>
<tr><td>Northumberland Marine (includes marine components)</td><td colspan="2">Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC

Puffin Fratercula arctica
Little Tern Sterna albifrons
Roseate Tern Sterna dougallii
Common Tern Sterna hirundo
Arctic Tern Sterna paradisaea
Sabdwich Tern Sterna sandvicensis
Guillemot Uria aalge</td><td colspan="2">NA</td></tr>
</table>

<table>
<tr><td></td><td>During the breeding season the area regularly supports: Sterna sandvicensis 19.66% of GB breeding population 5 year mean 2010-2014 Sterna hirundo 12.86% of GB breeding population 5 year mean 2010-2014 Sterna paradisaea 9.02% of GB breeding population 5 year mean (2010-2014) Sterna dougallii 93.02% of GB breeding population 5 year mean (2010-2014) Sternula albifrons 2.37% of GB breeding population 5 year mean (2010-2014) Fratercula arctica 1.05% of biogeographic population 5 year mean (2008-2013) Urla aalge 1.72% of biogeographic population 5 year mean (2010-2014).

Other important species of flora and fauna

Seabird assemblage

An internationally important assemblage of seabirds. In the breeding season the area regularly supports 214, 669 individual seabirds (five year peak mean 2010-2014) including Phalacrocorax carbo, Phalacrocorax aristotelis, Chroicocephalus ridibundus and Rissa tridactyla.</td><td></td></tr>
<tr><td></td><td>Negative impacts | Impact strength</td><td>Positive impacts | Impact strength</td></tr>
<tr><td></td><td>G01 - Outdoor sports and leisure activities, recreational activities | M</td><td></td></tr>
<tr><td></td><td>F01 - Marine and Freshwater Aquaculture | L</td><td></td></tr>
<tr><td>Northumbria Coast</td><td>Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC

Turnstone Arenaria interpres
Purple Sandpiper Calidris maritima
Little Tern Sterna albifrons
Arctic Tern Sterna paradisaea

During the breeding season the area regularly supports: Sterna albifrons 1.7% of the GB breeding population over 5 year peak mean (1993-1997) and Sterna paradisaea 2.92% of the GB population over 5 year peak mean (2010-2014).

During the wintering season the area regularly supports Arenaria interpres (Western Palearctic - wintering) 2.6% of biogeographic</td><td>Overview

The Northumbria Coast Ramsar site comprises several discrete sections of rocky foreshore between Spittal, in the north of Northumberland, and an area just south of Blackhall Rocks in County Durham. These stretches of coast regularly support nationally important numbers of purple sandpiper and high concentrations of turnstone. The Ramsar site also includes an area of sandy beach at Low Newton, which supports an nationally important breeding colony of little tern, and parts of three artificial pier structures which form important roost sites for purple sandpiper.

Species/populations occurring at levels of international importance. Qualifying Species/populations (as identified at designation)</td></tr>
</table>

	population over 5 year peak mean (1992/3-1996/7). During the wintering season the area regularly supports *Caldris maritima* 1.6% of biogeographic population over 5 year peak mean (1992/3-1996/7).	Species regularly supported during the breeding season: **Little tern** Sterna albifrons albifrons 43 apparently occupied nests, representing an average of 2.2% of the GB population (Seabird 2000 Census) Species with peak counts in winter: **Purple sandpiper** Calidris maritima maritima wintering 291 individuals, representing an average of 1.6% of the GB population (5 year peak mean 1998/9- 978 individuals, representing an average of 1% of the population (5 year peak mean 1998/9- 2002/3) **Noteworthy Fauna** Species currently occurring at levels of national importance: Species regularly supported during the breeding season: Great cormorant *Phalacrocorax carbo carbo* 248 apparently occupied nests, representing an average of 2.9% of the GB population (Seabird 2000 Census) Black-legged kittiwake *Rissa tridactyla tridactyla* 4070 apparently occupied nests, representing an average of 1.1% of the GB population (Seabird 2000 Census) Arctic tern *Sterna paradisaea* 1200 apparently occupied nests, representing an average of 2.2% of the GB population (Seabird 2000 Census) Species with peak counts in spring/autumn: European golden plover *Pluvialis apricaria apricaria*, 2911 individuals, representing an average of 1.1% of the GB population (5 year peak mean 1998/9- 2002/3) Species with peak counts in winter: Common eider Somateria mollissima mollissima 1361 individuals, representing an average of 1.8% of the GB population (5 year peak mean 1998/9- 2002/3) Sanderling *Calidris alba* 419 individuals, representing an average of 2% of the GB population (5 year peak mean 1998/9- 2002/3)

	Negative impacts	Impact strength	Positive impacts	Impact strength
	G01 - Outdoor sports and leisure activities, recreational activities	H	A02 - Modification of cultivation practices	H
	M02 - Changes in biotic conditions	H		
	K03 - Interspecific faunal relations	M		
	H01 - Pollution to surface waters (limnic & terrestrial, marine & brackish)	H		
	G05 - Other human intrusions and disturbances	H		
North York Moors	**Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC** **Merlin** *Falco columbarius* **Golden Plover** *Pluvialis apricaria* During the breeding season the area regularly supports: *Falco columbarius* at least 2.7% of the GB breeding population 1996, *Pluvialis apricaria* [North-western Europe - breeding] at least 2.3% of the GB breeding population 1996.		NA	
	Negative impacts	Impact strength	Positive impacts	Impact strength
	F03 - Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture (e.g. due to fishing gear), etc.)	H	A04 - Grazing	H
	H04 - Air pollution, air-borne pollutants	H	B06 - Grazing in forests/ woodland	H
	I01 - Invasive non-native species	H	A02 - Modification of cultivation practices	H
	J01 - Fire and fire suppression	H	A03 - Mowing / cutting of grassland	H
	M01 - Changes in abiotic conditions	H	B02 - Forest and Plantation management & use	H
North Pennine Moors	**Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC** **Hen Harrier** *Circus cyaneus* **Merlin** *Falco columbarius* **Peregrine Falcon** *Falco peregrinus* **Golden Plover** *Pluvialis apricaria*		NA	

<table>
<tr><td></td><td colspan="2">During the breeding season the area regularly supports: Circus cyaneus 2.2% of the GB breeding population - Count as at 1993 and 1994, Falco columbarius 10.5% of the GB breeding population Estimated population, Falco peregrinus 1.3% of the GB breeding population - Count as at 1991, Pluvialis apricaria [North-western Europe - breeding] at least 6.2% of the GB breeding population Estimated population</td><td colspan="2"></td></tr>
<tr><td></td><td>Negative impacts</td><td>Impact strength</td><td>Positive impacts</td><td>Impact strength</td></tr>
<tr><td></td><td>K05 - Reduced fecundity/ genetic depression</td><td>H</td><td>A04 - Grazing</td><td>H</td></tr>
<tr><td></td><td>A04 - Grazing</td><td>H</td><td>D05 - Improved access to site</td><td>H</td></tr>
<tr><td></td><td>J01 - Fire and fire suppression</td><td>H</td><td>A03 - Mowing / cutting of grassland</td><td>H</td></tr>
<tr><td></td><td>F03 - Hunting and collection of wild animals (terrestrial), including damage caused by game (excessive
density), and taking/removal of terrestrial animals (including collection of insects, reptiles, amphibians, birds of prey, etc., trapping, poisoning, poaching, predator control, accidental capture
(e.g. due to fishing gear), etc.)</td><td>H</td><td>G03 - Interpretative centres</td><td>H</td></tr>
<tr><td></td><td>J02 - Human induced changes in hydraulic conditions</td><td>H</td><td>A02 - Modification of cultivation practices</td><td>H</td></tr>
<tr><td></td><td></td><td></td><td>B02 - Forest and Plantation management & use</td><td>H</td></tr>
<tr><td>Irthinghead Mires</td><td colspan="2">NA</td><td colspan="2">Reason for designation

Supports an outstanding example of undamaged blanket bogs which are characteristic of the vegetation of upland north-western Britain. Most English (and many Scottish) blanket bogs have been extensively degraded by afforestation, burning, agricultural drainage and overgrazing. The Irthinghea Mires are one of few examples of this vegetation type in a near-natural state. There is also good representation of different topographic mire type and surface patterning.

A notable variety of Sphagnum mosses.

Butterburn Flow supports several rare plants, whilst a rare spider, Eboria caliginosa, has been recorded at Coom Rogg Moss.

Noteworthy flora and fauna
Nationally important species occurring on the site.
Higher Plants: Carex magellanica</td></tr>
</table>

		Lower Plants: *Sphagnum imbricatum, Sphagnum pulchrum, Sphagnum magellanicum* Invertebrates: *Eboria caliginosa*

Appendix B List of L3 catchments and associated screening results

L3 Identity	L3 Name	Catchment name	Distance to National site (m)	Nearest National site type	Nearest National site name	Recommendations (same for both options)
05-D29	Ponteland	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D25	Newburn	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D26	Denton Valley	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D31	Gosforth	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D32	Jesmond	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D28	Newcastle City	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D33	Lower Ouseburn	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D30	Benton	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D36	Heaton	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D55	Prudhoe	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D02	Crawcrook	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D11	Whickham South & Sunniside	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D16	Chowdene	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D15	Team Valley	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D24	Leam Lane,Wardley,Bill Quay	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D09	Derwenthaugh	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D17	Bensham	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D14	Dunston & Lobley Hill	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D10	Whickham North	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D06	Blaydon West	Tyneside	>5000	N/A	N/A	No further assessment necessary

05-D22	Felling & Felling Shore	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D23	Heworth	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D20	Gateshead Stadium,Mount Pleasant	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D12	Dunston Hill	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D18	Gateshead Central	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D04	Ryton East	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D13	Dunston,Teams	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D07	Blaydon East	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D03	Ryton West	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D21	Friars Goose	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D19	Gateshead West	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D27	Benwell	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D34	Byker	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D35	Walker	Tyneside	>5000	N/A	N/A	No further assessment necessary
05-D05	Ryton Haugh	Tyneside	>5000	N/A	N/A	No further assessment necessary
01-D11	Whittingham	North Northumberland	>5000	N/A	N/A	No further assessment necessary
03-D35	Bellingham	Upper Tyne	>5000	N/A	N/A	No further assessment necessary
03-D38	West Woodburn	Upper Tyne	>5000	N/A	N/A	No further assessment necessary
01-D18	Netherton	North Northumberland	>5000	N/A	N/A	No further assessment necessary
02-D43	Kirkwhelpington	South Northumberland	>5000	N/A	N/A	No further assessment necessary
02-D13	Morpeth	South Northumberland	>5000	N/A	N/A	No further assessment necessary
02-D22	Pegswood	South Northumberland	>5000	N/A	N/A	No further assessment necessary

02-D50	Hebron	South Northumberland	>5000	N/A	N/A	No further assessment necessary
02-D15	Ulgham	South Northumberland	>5000	N/A	N/A	No further assessment necessary
01-D60	Longhorsley	North Northumberland	>5000	N/A	N/A	No further assessment necessary
01-D05	Felton	North Northumberland	>5000	N/A	N/A	No further assessment necessary
01-D06	Newton on the Moor	North Northumberland	>5000	N/A	N/A	No further assessment necessary
02-D25	St Marys Hospital	South Northumberland	>5000	N/A	N/A	No further assessment necessary
03-D51	Gunnerton	Upper Tyne	>5000	N/A	N/A	No further assessment necessary
03-D50	Barrasford	Upper Tyne	>5000	N/A	N/A	No further assessment necessary
03-D05	Corbridge	Upper Tyne	>5000	N/A	N/A	No further assessment necessary
03-D68	Great Whittington	Upper Tyne	>5000	N/A	N/A	No further assessment necessary
02-D37	Fenwick	South Northumberland	>5000	N/A	N/A	No further assessment necessary
02-D32	Belsay	South Northumberland	>5000	N/A	N/A	No further assessment necessary
03-D01	Heddon on the Wall	Upper Tyne	>5000	N/A	N/A	No further assessment necessary
04-D11	Birtley	Derwent	>5000	N/A	N/A	No further assessment necessary
04-D16	Rowlands Gill	Derwent	>5000	N/A	N/A	No further assessment necessary
04-D12	Kibblesworth	Derwent	>5000	N/A	N/A	No further assessment necessary
03-D47	Wark	Upper Tyne	>5000	N/A	N/A	No further assessment necessary
03-D56	Birtley	Upper Tyne	>5000	N/A	N/A	No further assessment necessary
07-D10	Delves	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D09	Leadgate South	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D13	Crookhall	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D08	Leadgate North	Central Wear	>5000	N/A	N/A	No further assessment necessary

04-D01	Ebchester	Derwent	>5000	N/A	N/A	No further assessment necessary
04-D10	Chopwell,Blackhall Mill	Derwent	>5000	N/A	N/A	No further assessment necessary
07-D27	Ushaw Moor & Brandon	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D35	Carrville & Belmont & Shincliffe	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D42	Elvet Hill	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D25	Esh Winning	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D41	Durham City & Newton Hall	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D26	Bearpark	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D16	Langley Park & Witton Gilbert	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D15	Lanchester & Burnhope	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D01	Sacriston	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D02	Nettlesworth	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D07	Great Lumley	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D04	Chester le Street	Central Wear	>5000	N/A	N/A	No further assessment necessary
04-D08	Annfield Plain & Stanley	Derwent	>5000	N/A	N/A	No further assessment necessary
07-D14	South Stanley & Craghead	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D37	Sherburn	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D61	Houghton/Hetton	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D34	West Rainton	Central Wear	>5000	N/A	N/A	No further assessment necessary
08-D16	Fatfield	Wearside	>5000	N/A	N/A	No further assessment necessary
08-D15	Washington Central	Wearside	>5000	N/A	N/A	No further assessment necessary

08-D14	Washington North	Wearside	>5000	N/A	N/A	No further assessment necessary
08-D13	Nissan	Wearside	>5000	N/A	N/A	No further assessment necessary
07-D54	North Evenwood & Ramshaw	Central Wear	>5000	N/A	N/A	No further assessment necessary
06-D04	Low Etherley	Upper Wear	>5000	N/A	N/A	No further assessment necessary
06-D05	Crook	Upper Wear	>5000	N/A	N/A	No further assessment necessary
07-D59	Willington & Hunwick	Central Wear	>5000	N/A	N/A	No further assessment necessary
07-D47	Byers Green	Central Wear	>5000	N/A	N/A	No further assessment necessary
11-D61	Whitton & Thorpe Thewles	Teesside	>5000	N/A	N/A	No further assessment necessary
10-D15	Melsonby	Skerne	>5000	N/A	N/A	No further assessment necessary
10-D12	Neasham, Hurworth & Hurworth Place	Skerne	>5000	N/A	N/A	No further assessment necessary
10-D02	Darlington South	Skerne	>5000	N/A	N/A	No further assessment necessary
11-D04	Middleton St George	Teesside	>5000	N/A	N/A	No further assessment necessary
11-D05	Oaktree & Teesside Airport	Teesside	>5000	N/A	N/A	No further assessment necessary
10-D01	Darlington North	Skerne	>5000	N/A	N/A	No further assessment necessary
10-D09	Sadberge	Skerne	>5000	N/A	N/A	No further assessment necessary
10-D22	Newton Aycliffe	Skerne	>5000	N/A	N/A	No further assessment necessary
11-D64	Kirklevington	Teesside	>5000	N/A	N/A	No further assessment necessary
11-D58	Yarm	Teesside	>5000	N/A	N/A	No further assessment necessary
11-D08	Newby	Teesside	>5000	N/A	N/A	No further assessment necessary
11-D65	Aislaby Village	Teesside	>5000	N/A	N/A	No further assessment necessary
11-D63	Longnewton	Teesside	>5000	N/A	N/A	No further assessment necessary
08-D05	Peterlee	Wearside	0.00	SAC	Castle Eden Dene	Appropriate assessment required
08-D03	Easington	Wearside	0.00	SAC	Durham Coast	Appropriate assessment required

03-D29	Allendale Town & Catton	Upper Tees	0.00	SAC	North Pennine Dales Meadows	Appropriate assessment required
01-D36	Wooler	North Northumberland	0.00	SAC	River Tweed	Appropriate assessment required
01-D38	Chatton	North Northumberland	0.00	SAC	River Tweed	Appropriate assessment required
01-D39	Cornhill on Tweed	North Northumberland	0.00	SAC	River Tweed	Appropriate assessment required
01-D42	Etal	North Northumberland	0.00	SAC	River Tweed	Appropriate assessment required
01-D51	Norham	North Northumberland	0.00	SAC	River Tweed	Appropriate assessment required
01-D53	Horncliffe North	North Northumberland	0.00	SAC	River Tweed	Appropriate assessment required
06-D09	Stanhope & Crawleyside	Upper Wear	0.00	SPA	North Pennine Moors	Appropriate assessment required
02-D16	Broomhill	South Northumberland	0.00	SPA	Northumberland Marine	Appropriate assessment required
01-D32	Alnmouth	North Northumberland	0.00	SPA	Northumberland Marine	Appropriate assessment required
01-D26	Lesbury	North Northumberland	0.00	SPA	Northumberland Marine	Appropriate assessment required
02-D01	Blyth	South Northumberland	0.00	SPA	Northumberland Marine	Appropriate assessment required
11-D31	South Bank Eston	Teesside	0.00	SPA	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D43	Thornfield Road	Teesside	0.00	SPA	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D55	Stockton Centre	Teesside	0.00	SPA	Teesmouth and Cleveland Coast	Appropriate assessment required

11-D44	Middlesbrough North	Teesside	0.00	SPA	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D52	Stockton East	Teesside	0.00	SPA	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D33	Marske	Teesside	0.00	SPA	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D26	Middleton	Teesside	0.00	SPA	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D46	Middlesbrough East	Teesside	0.00	SPA	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D59	Thornaby North	Teesside	0.00	SPA	Teesmouth and Cleveland Coast	Appropriate assessment required
01-D35	Berwick	North Northumberland	0.00	RAMSAR	Lindisfarne	Appropriate assessment required
05-D01	Seaton Valley	Tyneside	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
05-D41	Cullercoats	Tyneside	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
05-D40	Whitley Bay	Tyneside	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
05-D44	Tynemouth	Tyneside	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
05-D47	Westoe	Tyneside	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
05-D50	Harton	Tyneside	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
01-D25	Longhoughton & Boulmer	North Northumberland	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required

01-D29	Craster South	North Northumberland	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
01-D27	Embleton	North Northumberland	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
01-D47	Beadnell	North Northumberland	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
01-D45	Seahouses	North Northumberland	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
02-D46	Bedlington & Cambois	South Northumberland	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
02-D45	Ashington	South Northumberland	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
01-D02	Amble & Warkworth	North Northumberland	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
08-D01	Seaham	Wearside	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
08-D12	Ryhope & Silksworth	Wearside	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
08-D06	Seaburn & Roker	Wearside	0.00	RAMSAR	Northumbria Coast	Appropriate assessment required
11-D32	Redcar	Teesside	0.00	RAMSAR	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D68	Port Clarence	Teesside	0.00	RAMSAR	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D67	High Clarence	Teesside	0.00	RAMSAR	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D49	North Billingham	Teesside	0.00	RAMSAR	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D28	Hartlepool South	Teesside	0.00	RAMSAR	Teesmouth and Cleveland Coast	Appropriate assessment required

11-D27	Burn Valley	Teesside	0.00	RAMSAR	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D24	Hartlepool North	Teesside	0.00	RAMSAR	Teesmouth and Cleveland Coast	Appropriate assessment required
11-D25	Thorpe Street/Headland	Teesside	0.00	RAMSAR	Teesmouth and Cleveland Coast	Appropriate assessment required
01-D70	Rock	North Northumberland	4638.89	SAC	Berwickshire & North Northumberland Coast	Appropriate assessment required pending further details
10-D21	Trimdon Grange	Skerne	3860.13	SAC	Castle Eden Dene	Mitigation necessary pending further details
05-D51	Cleadon Park	Tyneside	754.83	SAC	Durham Coast	Appropriate assessment required pending further details
08-D04	Hawthorn	Wearside	1307.29	SAC	Durham Coast	Appropriate assessment required pending further details
05-D49	Tyne Dock,Whiteleas	Tyneside	1604.53	SAC	Durham Coast	Appropriate assessment required pending further details
08-D02	Murton	Wearside	2024.40	SAC	Durham Coast	Appropriate assessment required pending further details
05-D52	Simonside	Tyneside	2270.15	SAC	Durham Coast	Appropriate assessment required pending further details
01-D56	Bowsden	North Northumberland	3892.87	SAC	Ford Moss	Appropriate assessment required pending further details
01-D49	Ellingham	North Northumberland	3297.37	SAC	Newham Fen	Mitigation necessary pending further details
06-D06	St Johns Chapel & Westgate	Upper Wear	720.77	SAC	North Pennine Dales Meadows	Appropriate assessment required pending further details
01-D37	Millfield	North Northumberland	30.32	SAC	River Tweed	Appropriate assessment required pending further details
01-D43	Crookham	North Northumberland	64.08	SAC	River Tweed	Appropriate assessment required pending further details
01-D12	Powburn	North Northumberland	100.39	SAC	River Tweed	Appropriate assessment required pending further details

01-D40	Branxton	North Northumberland	2114.30	SAC	River Tweed	Appropriate assessment required pending further details
01-D13	Eglingham	North Northumberland	2413.92	SAC	River Tweed	Appropriate assessment required pending further details
01-D15	Glanton	North Northumberland	2596.29	SAC	River Tweed	Appropriate assessment required pending further details
01-D09	Rothbury	North Northumberland	1862.65	SAC	Simonside Hills	Mitigation necessary pending further details
01-D10	Thropton	North Northumberland	2955.81	SAC	Simonside Hills	Mitigation necessary pending further details
07-D45	Cornforth	Central Wear	474.67	SAC	Thrislington	Mitigation necessary pending further details
10-D25	Chilton Lane	Skerne	555.51	SAC	Thrislington	Mitigation necessary pending further details
10-D23	Ferryhill South	Skerne	1050.39	SAC	Thrislington	Mitigation necessary pending further details
10-D27	Bishop Middleham	Skerne	1149.72	SAC	Thrislington	Mitigation necessary pending further details
07-D31	Bowburn	Central Wear	1165.88	SAC	Thrislington	Mitigation necessary pending further details
10-D24	Ferryhill North	Skerne	1749.71	SAC	Thrislington	Mitigation necessary pending further details
07-D44	Spennymoor	Central Wear	2539.76	SAC	Thrislington	Mitigation necessary pending further details
07-D33	Kelloe	Central Wear	3325.10	SAC	Thrislington	Mitigation necessary pending further details
10-D19	Fishburn	Skerne	3514.62	SAC	Thrislington	Mitigation necessary pending further details
11-D48	Sedgefield	Teesside	3725.06	SAC	Thrislington	Mitigation necessary pending further details
07-D57	Bishop Auckland	Central Wear	4475.22	SAC	Thrislington	Mitigation necessary pending further details
07-D30	Sunderland Bridge	Central Wear	4520.48	SAC	Thrislington	Mitigation necessary pending further details
10-D20	Trimdon Village	Skerne	4595.61	SAC	Thrislington	Mitigation necessary pending further details
03-D48	Newbrough & Fourstones	Upper Tyne	203.11	SAC	Tyne & Allen River Gravels	Mitigation necessary pending further details
03-D14	Haltwhistle	Upper Tyne	374.95	SAC	Tyne & Allen River Gravels	Appropriate assessment required pending further details
03-D03	Hexham	Upper Tyne	2131.20	SAC	Tyne & Allen River Gravels	Appropriate assessment required pending further details
03-D49	Humshaugh	Upper Tyne	4129.20	SAC	Tyne & Allen River Gravels	Mitigation necessary pending further details

03-D04	Anick & Oakwood	Upper Tyne	4210.24	SAC	Tyne & Allen River Gravels	Mitigation necessary pending further details
03-D63	Alston	Upper Tyne	397.52	SAC	Tyne & Nent	Appropriate assessment required pending further details
09-D23	Bowes	Upper Tees	313.76	SPA	North Pennine Moors	Appropriate assessment required pending further details
09-D17	Middleton in Teesdale	Upper Tees	338.42	SPA	North Pennine Moors	Appropriate assessment required pending further details
07-D52	Butterknowle	Central Wear	1291.40	SPA	North Pennine Moors	Appropriate assessment required pending further details
06-D13	Wolsingham	Upper Wear	1295.80	SPA	North Pennine Moors	Appropriate assessment required pending further details
04-D02	Consett & Castleside	Derwent	2366.22	SPA	North Pennine Moors	Appropriate assessment required pending further details
03-D28	Haydon Bridge	Upper Tyne	2622.26	SPA	North Pennine Moors	Appropriate assessment required pending further details
09-D06	Barnard Castle	Upper Tees	3742.89	SPA	North Pennine Moors	Appropriate assessment required pending further details
06-D15	Tow Law	Upper Wear	4960.54	SPA	North Pennine Moors	Appropriate assessment required pending further details
11-D34	Saltburn,Skelton Brotton	Teesside	259.63	SPA	North York Moors	Mitigation necessary pending further details
11-D36	Guisborough	Teesside	559.96	SPA	North York Moors	Mitigation necessary pending further details
11-D22	Faceby	Teesside	1170.26	SPA	North York Moors	Mitigation necessary pending further details
11-D14	Carlton in Cleveland	Teesside	1334.95	SPA	North York Moors	Mitigation necessary pending further details
11-D16	Great Broughton	Teesside	1862.23	SPA	North York Moors	Mitigation necessary pending further details
11-D35	Loftus	Teesside	2026.71	SPA	North York Moors	Mitigation necessary pending further details
11-D09	Great Ayton	Teesside	2029.83	SPA	North York Moors	Mitigation necessary pending further details

11-D23	Potto	Teesside	2301.71	SPA	North York Moors	Mitigation necessary pending further details
11-D13	Stokesley	Teesside	3488.39	SPA	North York Moors	Mitigation necessary pending further details
11-D20	Hutton Rudby	Teesside	4977.51	SPA	North York Moors	Mitigation necessary pending further details
02-D17	Lyneburn Valley	South Northumberland	294.38	SPA	Northumberland Marine	Mitigation necessary pending further details
01-D30	Dunstan	North Northumberland	613.79	SPA	Northumberland Marine	Appropriate assessment required pending further details
02-D02	Cramlington	South Northumberland	1424.19	SPA	Northumberland Marine	Mitigation necessary pending further details
01-D04	Acklington & Togston	North Northumberland	2815.82	SPA	Northumberland Marine	Mitigation necessary pending further details
01-D03	Shilbottle	North Northumberland	2837.28	SPA	Northumberland Marine	Appropriate assessment required pending further details
01-D01	Alnwick	North Northumberland	3403.43	SPA	Northumberland Marine	Appropriate assessment required pending further details
02-D20	Stannington Station	South Northumberland	4862.19	SPA	Northumberland Marine	No further assessment necessary
02-D21	Hepscott	South Northumberland	4969.06	SPA	Northumberland Marine	No further assessment necessary
11-D45	Middlesbrough South	Teesside	241.47	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details
11-D29	Greatham	Teesside	362.06	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details
11-D42	Tees Valley	Teesside	491.36	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details
11-D60	Thornaby South & Ingleby Barwick	Teesside	521.96	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details

11-D51	South Billingham	Tesside	594.17	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details
11-D56	Stockton South	Teesside	1476.55	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details
11-D57	Eaglescliffe	Teesside	1912.48	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details
11-D54	Eastbourne	Teesside	2035.43	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details
11-D53	Stockton West	Teesside	2235.25	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details
11-D47	Nunthorpe	Teesside	3409.03	SPA	Teesmouth and Cleveland Coast	Mitigation necessary pending further details
01-D52	Lowick	North Northumberland	3625.96	RAMSAR	Holburn Lake & Moss	Appropriate assessment required pending further details
01-D59	Haggerston	North Northumberland	1716.48	RAMSAR	Lindisfarne	Appropriate assessment required pending further details
01-D50	Belford Industrial Estate	North Northumberland	2051.64	RAMSAR	Lindisfarne	Appropriate assessment required pending further details
01-D46	Belford	North Northumberland	2639.36	RAMSAR	Lindisfarne	Appropriate assessment required pending further details
05-D39	Brierdene	Tyneside	321.65	RAMSAR	Northumbria Coast	Mitigation necessary pending further details
05-D42	Whitley Lodge	Tyneside	455.19	RAMSAR	Northumbria Coast	Mitigation necessary pending further details
05-D45	North Shields	Tyneside	568.14	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
05-D48	High Shields	Tyneside	606.66	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details

08-D10	Hendon Burn	Wearside	928.97	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
05-D38	Chirton	Tyneside	1573.22	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
08-D08	Wearmouth	Wearside	1583.74	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
08-D07	Hylton Castle	Wearside	1749.06	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
05-D46	Royal Quays	Tyneside	1752.40	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
05-D43	Willington Quay	Tyneside	2206.63	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
08-D11	Pallion	Wearside	2214.93	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
08-D09	Barnes Burn	Wearside	2343.31	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
05-D37	Wallsend	Tyneside	3903.04	RAMSAR	Northumbria Coast	Mitigation necessary pending further details
01-D31	Rennington	North Northumberland	4287.45	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
05-D53	Jarrow,Hedworth	Tyneside	4302.43	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
05-D54	Hebburn	Tyneside	4416.11	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details
07-D60	Herrington	Central Wear	4692.97	RAMSAR	Northumbria Coast	Appropriate assessment required pending further details