Summer 2023

Regional Water Resources Plan – North West

Strategic Environmental Assessment

Environmental Report

Non-Technical Summary

Tionscadal Éireann Project Ireland 2040

6 CLEAN WATER AND SANITATION

Data disclaimer: This document uses best available data at time of writing. As data relating to population forecasts and trends are based on information gathered before the Covid-19 Pandemic, monitoring and feedback will be used to capture any updates. The National Water Resources Plan will also align to relevant updates in applicable policy. In December 2022, the Water Services (Amendment) (No. 2) Act, 2022 was signed into law. This act provides that, from the 31 December 2022, Irish Water will only be known as Uisce Éireann. It also provides that, from that date, all references in any enactment, legal proceedings or other document to Irish Water shall be construed as references to Uisce Éireann only. The SEA Environmental Report and Appendices, including this Non-Technical Summary, reflect this transition from Irish Water to Uisce Éireann.

Baseline data included in the RWRP-NW has been incorporated from numerous sources including but not limited to; National Planning Framework, Central Statistics Office, Regional Spatial and Economic Strategies, Local Authority data sets, Regional Assembly data sets and Uisce Éireann data sets. Data sources are detailed in the relevant sections of the RWRP-NW. The year 2019 was selected as the base year to align with the planning period (2019-2025) of the NWRP.

Limitation: This report has been prepared on behalf of, and for the exclusive use of Jacobs' Client (Uisce Éireann), and is subject to, and issued in accordance with, the provisions of the contract between Jacobs and the Client. Jacobs accepts no liability or responsibility whatsoever for, or in respect of, any use of, or reliance upon, this report by any third party.

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1 Introduction and Background

On the 1st of January 2014, through the Water Services Act (No. 1) 2013, Uisce Éireann assumed statutory responsibility for the provision of public water services and management of water and wastewater investment. Uisce Éireann's role is to provide public water and wastewater services throughout the country.

Uisce Éireann is the custodian with the responsibility to manage the precious water resource and, with Local Authority partners, secure it for future generations. It is Uisce Éireann's responsibility to ensure that all their customers receive a safe and secure supply of drinking water and have their wastewater collected, appropriately treated and returned to the environment. Uisce Éireann support Ireland's social and economic growth in a sustainable manner through appropriate investment in water services.

1.1 What is the National Water Resources Plan?

Effective water services, including the delivery of a sustainable and reliable clean water supply and safe disposal of wastewater, are essential for a modern country. Being able to understand and estimate how much water is required, where it is required, and the variability of requirements over the course of the year or over time, is essential to plan appropriately for the future of the public water supply.

A Water Resources Plan is a strategic plan used to identify deficiencies and need across a water supply and to develop Plan level solutions to address these issues.

Uisce Éireann's National Water Resources Plan (NWRP) will be the first resources plan for the public water supply in the Republic of Ireland. It will allow Uisce Éireann to integrate Government Policy, Legislation and external factors that have the potential to impact Uisce Éireann supplies into the planning and operation of its existing and future supply asset base.

The objective of a NWRP is to manage customer and communities needs while meeting their requirements over the short, medium and long term by ensuring safe, secure, sustainable and reliable water supplies. The NWRP will:

- Enable Uisce Éireann to address needs across our water supplies in the most effective way over time, by identifying and in turn, prioritising what needs to be included in regulated investment cycles;
- Ensure that there is a transparent framework to develop the most appropriate projects/programmes to meet statutory obligations in relation to water supply; and
- Provide a framework to track outcomes, allowing interventions to be prioritised to bring the water supply up to the required standards in the shortest possible timeframe.

1.2 Development of the National Water Resources Plan

As this is Uisce Éireann's first NWRP it has been split into two distinct stages, summarised in Table NTS 1.1. Uisce Éireann is currently in Phase 2.

Table NTS 1.1 National Water Resources Plan Phases

NWRP Phases	NWRP Reports	Content
Phase 1: Framework Plan Completed	NWRP – draft Framework Plan	Need Identification including the Supply Demand Balance Calculations NWRP Objectives

NWRP Phases	NWRP Reports	Content
		Generic Option Types Options Assessment Methodology Published for consultation with an SEA Environment Report and Natura Impact Statement.
	Case Study - Study Area	Test of the Options Assessment Methodology against Study Area 5 provided as an example with the draft NWRP Framework to demonstrate the methodology. The outcomes were not part of the draft Framework Plan consultation.
	NWRP - final Framework Plan	Finalisation of the Framework Plan taking account of consultation comments. Framework Plan adopted and published with an SEA Statement and Appropriate Assessment Determination in May 2021
Phase 2: RWRPs (Regional Water Resource Plans)	Draft RWRPs (draft Regional Plans)	Application of Options Assessment Methodology and Identification of the Preferred Approach for the following regions: **North West (Group Area 1)** South West (Group Area 2) South East (Group Area 3) Eastern and Midlands (Group Area 4)
	Final RWRPs (final Regional Plans)	Finalise and adopt each Regional Plan once their individual consultations are completed.

1.3 Strategic Environmental Assessment

This is the Non-Technical Summary (NTS) report of the Strategic Environmental Assessment (SEA) Environmental Report for the Regional Water Resources Plan for the North West (RWRP-NW). The report has been prepared having regard to the SEA Directive (2001/42/EC) and its provisions that are transposed into Irish law by European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No. 435 of 2004 as amended in 2011). The SEA Environmental Report, together with its appendices, this NTS and the supporting information from the appropriate assessment (documented in the Natura Impact Statement) are published alongside the Regional Plan and notice given in accordance with Article 16 of the SEA Regulations.

1.3.1 Legislative Requirement

Council Directive 2001/42/EC of the European Parliament and of the Council of 27th June 2001 on the assessment of the effects of certain plans and programmes on the environment (the SEA Directive) established the statutory requirement for SEA as part of the development of certain plans and programmes. The Directive is applicable to the Framework Plan and each of the Regional Plans of the NWRP.

The transposing Irish Regulations are the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. No. 435 of 2004) as amended by the European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011 (S.I. No. 200 of 2011).

1.3.2 Strategic Environmental Assessment Process

The purpose of SEA is to enable plan-making authorities such as Uisce Éireann to incorporate environmental considerations into decision-making at an early stage and in an integrated way throughout the plan-making process. The SEA process is undertaken in four stages. The progress for each stage of the SEA process for the North West Regional Plan is summarised in Table NTS 1.2. The SEA process for Phase 1 of the NWRP, the Framework Plan, has already been completed.

Table NTS 1.2 Stages of SEA for the North West Regional Plan

Stage	Purpose and Requirements	Progress to Date / Current Status
Stage 1: Screening	Prior to starting the SEA process, a plan or programme undergoes "screening" to determine whether it requires an SEA.	SEA Screening Statement – Uisce Éireann (as the responsible authority) determined that SEA was required for the NWRP when screening was carried out in August 2017 and included with the Regional Plan SEA Scoping Report (May 2021).
Stage 2: Scoping	Consideration of the context and objectives of the SEA provides information on baseline data, identifies relevant environmental issues and trends, and defines the parameters of the scope of the SEA for the purpose of consultation.	SEA Scoping Report – The SEA Scoping Report set the geographical and temporal scope of the Regional Plan and SEA, the baseline environment, and a proposed framework of SEA objectives to inform the Stage 3 assessment. Formal statutory consultation was carried out between 1st June 2022 and 29th June 2022.
Stage 3: Identification, Prediction, Evaluation and Mitigation of Potential Effects	Within the context and parameters identified at the scoping stage. Identification and evaluation of likely significant effects of the Regional Plan is carried out, including consideration of alternatives and determination of measures to mitigate and monitor potential residual effects.	Environmental Report (SEA of the Regional Plan). Consultation will take place alongside the Regional Plan consultation.
Stage 4: Consultation, Revision and Post-Adoption	Consultation with statutory consultees and the public. This may require changes to the Regional Plan and SEA Environmental Report in light of responses. Implementation of the monitoring plan.	This stage will follow on from stage 3 and involve responding to the consultation comments and incorporating into the Regional Plan, finalisation of the plan and publication of the Post-Adoption SEA Statement **Current Stage in the SEA Process**

1.3.3 Development of the Regional Plan within the Framework Plan, the SEA and Appropriate Assessment

The options development process which Uisce Éireann propose to use to develop the Preferred Approach for all Regional Plans is described within the Framework Plan and was subject to a separate SEA process and finalised in May 2021. The options assessment methodology is outlined in chapter 6, with further detail available within the Framework Plan and the SEA Statement which accompanies the Framework Plan which can both be found at: https://www.water.ie/projects/strategic-plans/national-water-resources/

SEA and Appropriate Assessment requirements were incorporated into the development of the Framework Plan and have influenced the development of the options assessment methodology for this Regional Plan and future Regional Plans. Figure NTS 1.1 shows how the SEA and Appropriate Assessment reporting will align with each other and with development of the Regional Plan.

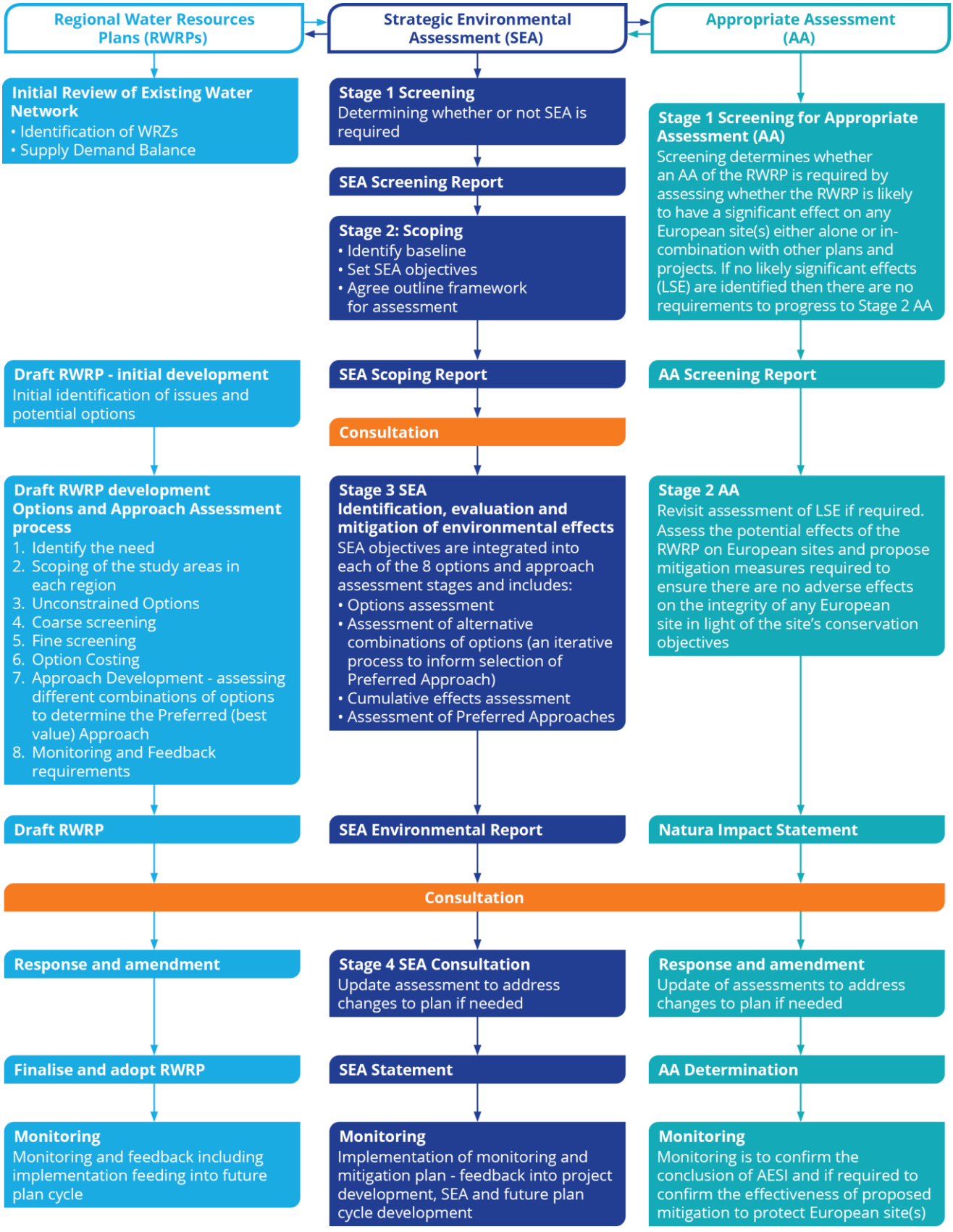


Figure NTS 1.1 Regional Plan and Strategic Environmental Assessment Process

2 Overview of the North West Region

Uisce Éireann is planning to develop a national programme of proposed solutions for reducing and eliminating the Supply Demand Balance deficits for each Water Resource Zone (WRZ), meet water quality requirements and bring greater resilience to the water supply network. The aim of the programme is based around the following three pillars, as shown in Figure NTS 2.1.

- **Lose Less:** reducing water lost to the system through leakage;
- **Use Less:** reducing water use through efficiency measures; and
- **Supply Smarter:** improving the quality, resilience and security of Uisce Éireann's supply through infrastructure improvements.

Figure NTS 2.1 Three Pillars to address the key challenges to the draft Framework Plan

Together these pillars will enable Uisce Éireann to optimise its capital and operational interventions to achieve the best outcomes and react to emerging issues.

Supply Demand Balance (SDB) calculations - Is a way of comparing the available resources to supply customers with their projected water needs over time.
Water Resource Zones (WRZ) - are the management units at which resources planning is undertaken, and the SDB is calculated for each WRZ. The Framework Plan has identified 539 WRZs in Ireland.
Levels of Service - the reliability of supply that Uisce Éireann customers can expect to receive and is expressed as a frequency or return period of supply failure. For example, if the Levels of Service is stated as 1 in 50, as a customer, you would only ever expect to experience a water outage or severe limitations to your supply, on average, once every 50 years

There are 142 Water Treatment Plants in the North West Region, which collectively serve 732,700 people or 18% of the population of Ireland, via approximately 17,700 kilometres of distribution network. The size of these Water Treatment Plants varies, with the largest three in the region producing on average 32% of the water supplied and the remaining 139 producing on average about 68% or 251 Ml/d of the total supply.

The Water Treatment Plans feed water into supply areas known as (WRZs). Each WRZ is an independent water supply system serving a region, city, town or village and is governed by topography or the extent of the water distribution network in an area. Within a WRZ most customers receive the same Level of Service, measured as a probability of interruption to services and the aim of the NWRP is

to bring the Level of Service across the network to a 1 in 50 Level of Service (one interruption to the supply in 50 years).

The RWRP-NW summarises key issues that impact the quality, sustainability and reliability of our existing water supplies, in this region, including:

- Levels of Service;
- Treatment Capacity;
- Water Quality;
- Network Performance;
- Abstractions potentially at risk of exceeding sustainable abstraction thresholds; and
- Constrained Funding.

In addition, Uisce Éireann also face key challenges over the coming years, which have the potential to exacerbate the current problems in the region, including:

- A growing population;
- A changing climate;
- Changes in land use and emerging contaminants;
- Legislative changes; and
- An Environment in Need.

Addressing these challenges as part of the overall NWRP, ensures that future infrastructure development is proportionate to the identified need and is sustainable, reliable and resilient.

2.1 North West Study Areas

The North West Region is further subdivided into seven study areas (SAs) based on Water Framework Directive catchment and WRZ boundaries within the region, as shown in Figure NTS 2.2.

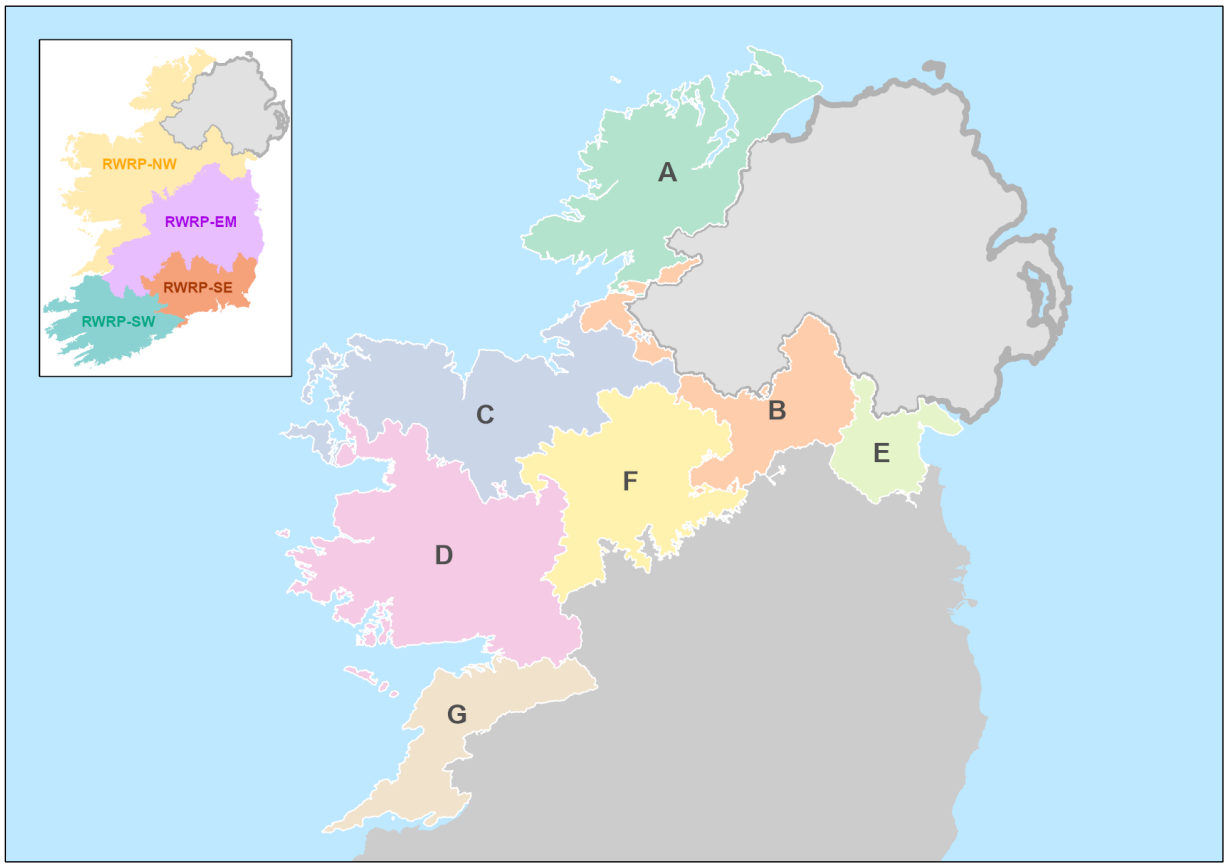


Figure NTS 2.2 North West Region Study Areas

3 Consultation

3.1 Purpose of Consultation and Engagement

Public consultation and stakeholder engagement is a key element in ensuring stakeholders and members of the public have an opportunity to contribute to the development of plans and projects in Ireland. Uisce Éireann is undertaking an accessible, meaningful, and accountable consultation and engagement process with stakeholders and members of the public throughout the development of the NWRP including the Regional Water Resource Plans (RWRPs).

There are two main stages to the engagement and consultation relevant to the Regional Water Resource Plan North West (RWRP-NW) and the SEA Environmental Report. The overall consultation process for the RWRP-NW is summarised in Figure NTS 3.1 below:

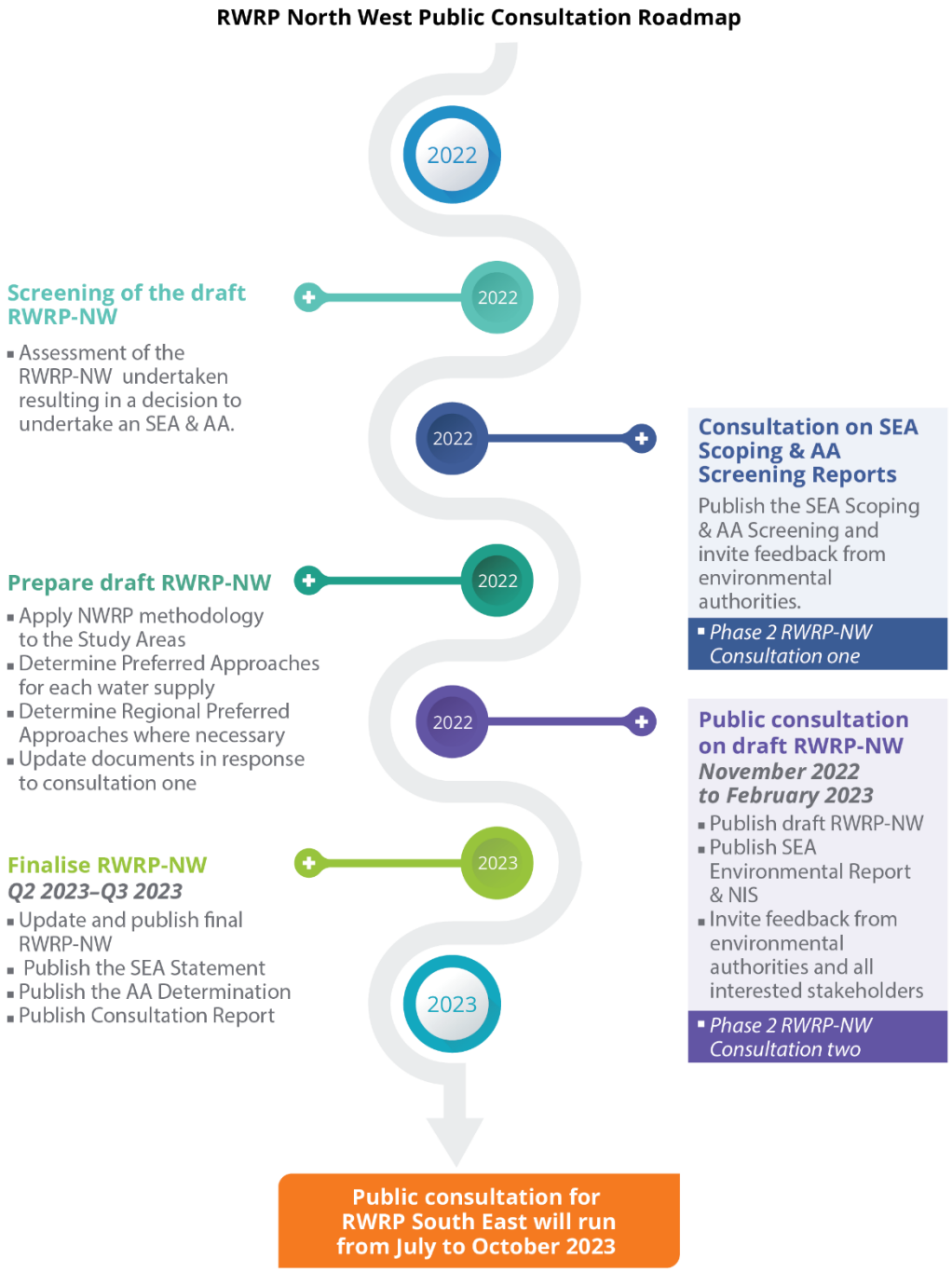


Figure NTS 3.1 Consultation Roadmap

- **Framework Plan SEA process and consultation** – including SEA scoping consultation and wider engagement on the developing options and approach assessment methodology and the publication of the draft Framework Plan and SEA Environmental report for consultation which focused on setting out the methodology to be applied through the Regional Plans. The NWRP Framework Plan Consultation adopted in Spring 2021 and it, along with the SEA Statement and Appropriate Assessment Determination, are available on https://www.water.ie/projects/strategic-plans/national-water-resources/; and
- **RWRP-NW SEA process and consultation** – the assessment approach applies the methodology from the adopted Framework Plan and, as part of the SEA process, scoping consultation has been undertaken and responses have informed the SEA and RWRP-NW development.

The RWRP-NW has been developed applying the methodology from the adopted Framework Plan and SEA taking account of the consultation received through that process so although a separate formal process is followed for each Regional Plan, it is closely linked to the Framework Plan.

3.2 Consultation 1: Scoping Stage

A SEA scoping report was consulted on In line with Article 9 (5) of the SEA Regulations (S.I. No. 435 of 2004), and was issued to the following statutory Environmental Authorities:

- The Environmental Protection Agency;
- Department of Housing, Local Government and Heritage;
- The Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media - Development Applications Unit;
- The Department of Agriculture, Food and the Marine;
- Department of the Environment, Climate and Communications; and
- For transboundary consultation, Northern Ireland's Department of Agriculture, Environment and Rural Affairs.

This SEA Scoping Report is available online at the following website: https://www.water.ie/nwrp.

The scoping consultation commenced on 1st June 2022 and closed on the 29th June 2022, Comments received have been considered.

3.3 Consultation 2: Draft RWRP-NW and Environmental Reports

The SEA Environmental Report was published on the Uisce Éireann website (https://www.water.ie/nwrp) alongside the draft Regional Plan and the NIS for public consultation. The SEA Environmental Report outlined the assessment of the Regional Plan, including effects on the environment and proposed mitigation. In accordance with Article 11 of European Communities (Environmental Assessment of Certain Plans and Programmes (S.I. No. 435 of 2004), SEA environmental authorities, as well as any relevant transboundary authorities (for example, Northern Ireland Environmental Agency), were notified so that they may make a submission or observation in relation to the SEA Environmental Report or the Regional Plan to Uisce Éireann.

Uisce Éireann has referred to this SEA Environmental Report and the NIS when preparing the Regional Plan for the North West area. The reports were on display for statutory public consultation between November 2022 and February 2023.

Consultation 2 (statutory public consultation) took place between 22nd November 2022 and 21st February 2023.

The SEA Environmental Report and this NTS incorporate the updates and amendments responding to the comments received and associated amendments to the final Regional Plan. The revised SEA Environmental Report is produced as support for the SEA Statement and these SEA reports are published alongside the adopted Regional Plan for the North West Region.

4 Review of Relevant Plans, Policies and Programmes

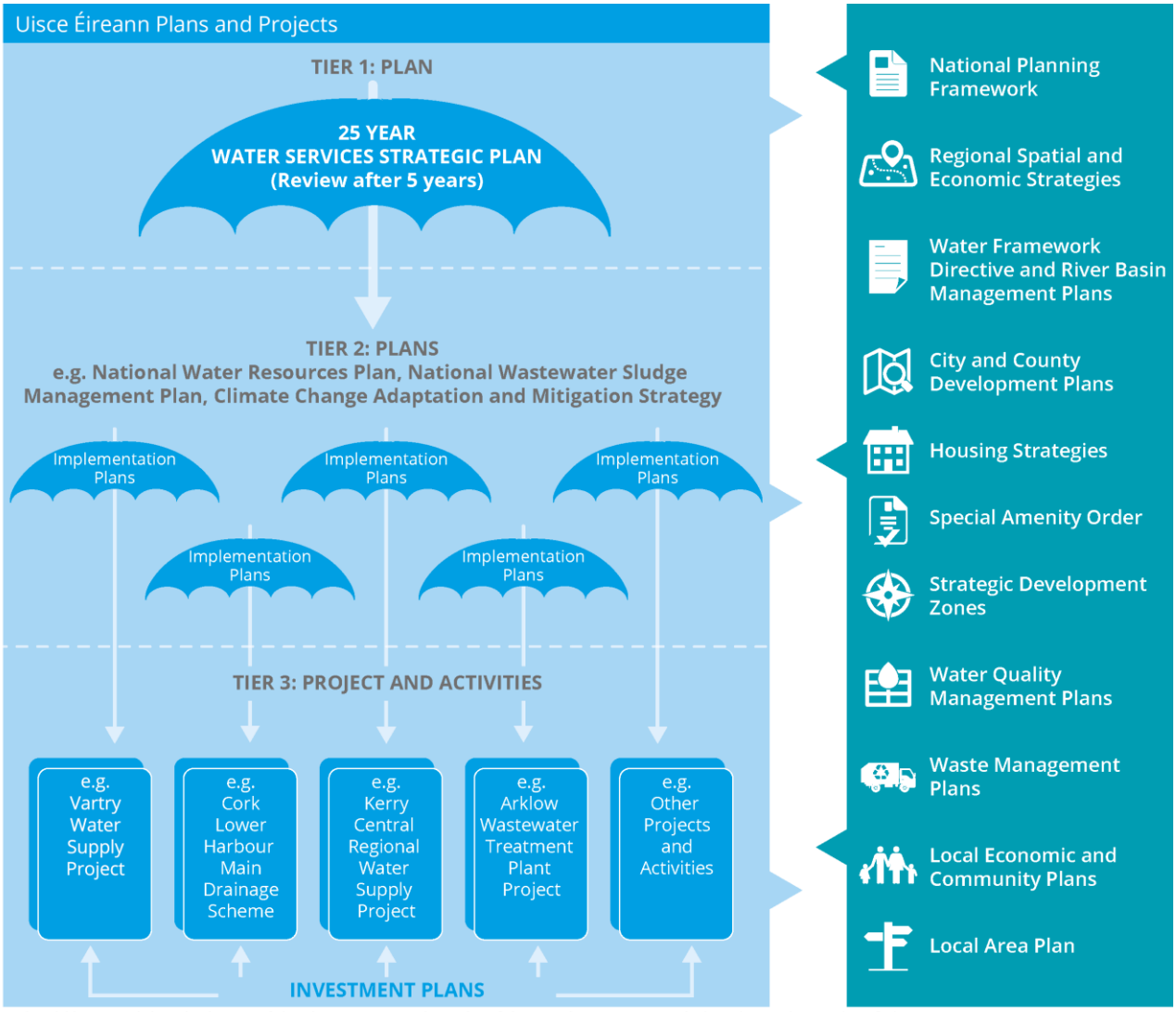
A review of, the relationship with the relevant policy, plan, programme and legislative framework was conducted as part of the SEA Scoping Report for RWRP-NW and has been further refined following that consultation process. This was an important part of setting the context for the SEA. The review process has informed the scope of the SEA, the focus for identifying the baseline environment and the development of the SEA objectives. Key influences identified at the national level which also apply to the Regional Plan include:

- UN Sustainable Development Goals (SDGs);
- EU Water Framework Directive (Directive 2000/60/EC of the European Parliament and of the Council establishing a framework for Community action in the field of water policy);
- EU Drinking Water Directive (Directive 2020/2184 of the European Parliament and of the Council on the quality of water intended for human consumption (recast);
- River Basin Management Plan for Ireland 2018-2021 (the draft 2022-2027 Plan was published for consultation in September 2021);
- National Adaptation Plan & Adaptation Plan for Water Quality and Water Services Infrastructure;
- Climate Action and Low Carbon Development Act 2015 (as amended 2023);
- Climate Action Plan;
- Water Environment (Abstractions and Associated Impoundments) Act 2022 (Abstractions Act);
- National Planning Framework – Project Ireland 2040;
- National Adaptation Framework Sectoral Adaptation Planning;
- Regional Spatial and Economic Strategy (RSES) for the Eastern and Midlands Region, RSES for the Southern Region and RSES for the Northern and Western Regional Assembly; and
- Related Uisce Éireann plans and strategies including the Water Services Strategic Plan (Tier 1 plan), National Wastewater Sludge Management Plan, Lead in Drinking Water Mitigation Plan, Sustainable Energy Strategy - Climate Change Mitigation and Adaptation Strategy, Leakage Reduction Programme and National Disinfection Programme.

A focussed list of additional local level plans policies and strategies relevant to the Regional Plan for the North West specifically is provided in the SEA Environmental Report, Appendix F, section F.2. Regional and local level plans likely to be key for the purposes of the SEA for the Regional Plan fall under five main groups:

- County Development Plans, Local Area Plans and Town Development Plans – Planning Authorities are legally required to make County and City Development Plans which sets an agenda for development to make adequate provision for the scale of population growth projected. Where appropriate, the latest draft plans have been used;
- County Heritage Plans and County Biodiversity Action Plans – these plans help ensure targets for species and habitat conservation in the National Biodiversity and Heritage Plans are effective at a local level;
- County Climate Change Adaptation Strategies and Climate Action Plans – these strategies and plans establish future climate risks at a local level and propose actions to adapt to currently observed and future climatic changes;

- County Landscape Character Assessments – these assessments classify and describe the landscape in a county; and
- Regional Waste Management Plans.



It should be noted that the listing of the documents on the right of the graphic is not intended to show a hierarchy of plans or an alignment of the plans with the Uisce Éireann Tier 1, Tier 2 and Tier 3 plans/projects.

Figure NTS 4.1 Interaction between the Planning System and Uisce Éireann's Plans and Programs

Other relevant plans, policies and strategies considered and listed within Appendix F include Conservation Plans, Renewable Energy Strategies, Community Biodiversity Action Plans and Noise Action Plans.

These plans and policies have been taken into account in the development of the SEA objectives as described in the Framework Plan, the RWRP-NW SEA Scoping Report and the assessment criteria used to assess the options and alternatives considered in the development of the RWRP-NW. Figure NTS 4.1 identifies how the NWRP relates to the key national, regional and local level plans, policies and strategies. When plans, policies and strategies are updated they will be incorporated through the monitoring process (see section 10).

5 Baseline Environment

This section sets the proposed geographical and temporal scope of the SEA for the Regional Plan, and provides environmental baseline information on key environmental topics including:

- Population, Economy, Tourism and Recreation, and Human Health;
- Water Environment;
- Biodiversity, Flora and Fauna;
- Material Assets;
- Landscape and Visual Amenity;
- Air Quality and Noise;
- Climate Change;
- Cultural Heritage; and
- Geology and Soils.

5.1 Scope of the Assessment

5.1.1 SEA Geographical Scope

At this stage of the assessment the core baseline area for the SEA of the Regional Plan for the North West is the area covered by the seven study areas which comprise the North West Region (see Figure NTS 5.1) and sites designated for nature conservation that are hydrologically connected to waterbodies in the core baseline area. The assessment process undertaken for the SEA and Appropriate Assessment during evolution of the Plan will consider the potential for linkages of this type, and where necessary, the geographic scope of the core baseline area will be extended accordingly.

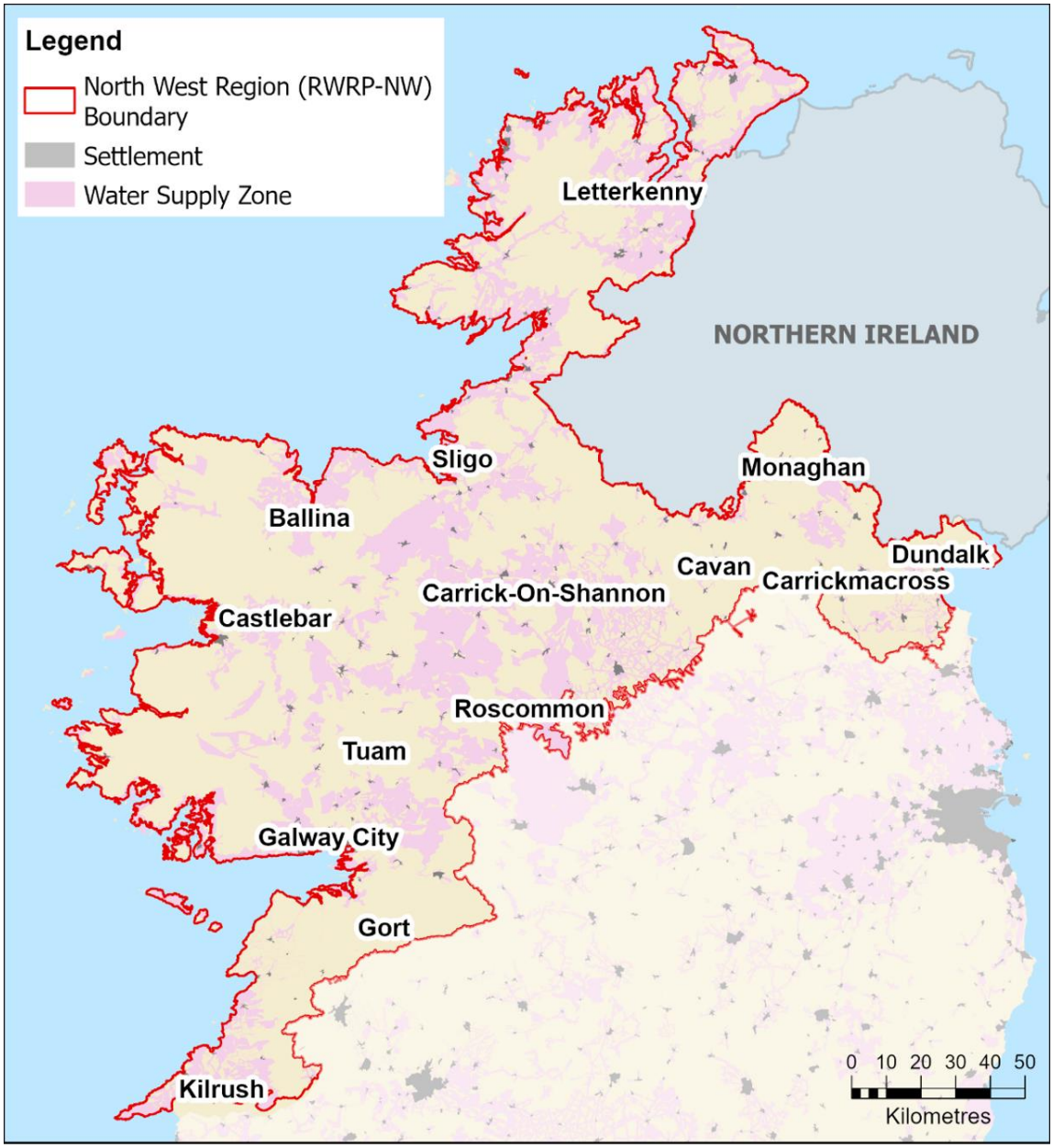


Figure NTS 5.1 Water Supply Zones and Key Settlements in the North West Region

5.1.2 Transboundary Effects

The RWRP-NW covers Uisce Éireann's operational area for the North West which which has a long border with Northern Ireland (see Figure NTS 5.1). There is potential for transboundary effects on the basis of proximity of the border with Northern Ireland, shared WFD catchment units, waterbodies and other pathways for effects. Therefore, transboundary effects are scoped in for the RWRP-NW and will be considered further as part of assessing the proposals for the RWRP-NW.

Transboundary policies and plans have been reviewed as listed in Appendix F of the SEA Environmental Report and the potential for transboundary effects associated with plan proposals have been considered through the assessment process and findings are included in the Environmental Report. Where there are any new proposals for new construction works or schemes that are in close proximity to the border and with potential pathways for impacts, we will consult further with the relevant organsations in Northern Ireland and also include consideration of local landscape designations. The RWRP-NW, SEA Environmental Report and Natura Impact Statement were provided to the relevant Northern Ireland agencies as part of the consultation process.

5.1.3 SEA Temporal Scope

The proposed temporal scope for the SEA is the 25-year period between 2019 and 2044 that is covered by the Framework Plan and RWRP-NW.

5.2 High Level Environmental Trends in the North West Region and Across Ireland

The Environmental Protection Agency's latest State of the Environment Report (SOER 2020) (Environmental Protection Agency, 2020) provides:

- An assessment of the overall quality of Ireland's environment;
- An outline of the pressures being placed on this environment; and
- The key actions that can address these pressures.

The following areas identified as challenges to address across Ireland within the SOER 2020 are particularly pertinent to development of the RWRP-NW:

- **Climate:** high greenhouse gas emissions continue, and the scale and pace of greenhouse gas emission reductions must accelerate to meet 2023 Climate Action Plan targets;
- **Water:** deteriorating water quality trends over the last 20 years, particularly for rivers; and
- **Nature:** deteriorating protected habitat trends, with 85% of EU protected habitats having unfavourable status. Trends for EU protected species are mixed, however freshwater species are most at risk and some freshwater species are under threat.

Waste and the circular economy and air quality are also areas where further action is needed to meet long-term objectives and targets.

These three key challenges of relevance to the RWRP-NW are directly linked to the following United Nations Sustainable Development Goals:

- **Sustainable Development Goal 6 Clean Water and Sanitation: Ensure availability and sustainable management of water and sanitation for all;**
- **Sustainable Development Goal 13 Climate Action:** Take urgent action to combat climate change and its impacts;
- **Sustainable Development Goal 14 Life Below Water:** Conserve and sustainably use the oceans, seas and marine resources for sustainable development; and
- **Sustainable Development Goal 15 Life On Land:** Protect and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation and halt biodiversity loss.

Significant population increase is anticipated over the coming two decades, which is an important consideration for water demand, and subsequently for the water environment and compliance with the Water Framework Directive and Sustainable Development Goals 6 and 14. Specific indicators for meeting the UN Sustainable Development Goals in Ireland are reported on Ireland's Sustainable Development Goals data hub.

5.3 Baseline Topic Interactions, Issues and Opportunities

5.3.1 Interrelationships between SEA Topics

In accordance with the SEA Directive, it is a requirement to recognise the interrelationships between environmental topics, as changes to one environmental aspect can directly or indirectly influence others.

Table NTS 5.1 below indicates the potential interrelationships between SEA topics demonstrating most topics interact to some level in a range in some circumstances. Key interactions are highlighted.

Table NTS 5.1 Interrelated SEA topics

	Population, local economy, tourism and recreation, and human health	Water environment	Biodiversity	Material assets	Landscape and visual amenity	Air quality and noise*	Climate change	Cultural heritage
Water environment								
Biodiversity,								
Material assets								
Landscape and visual amenity								
Air quality and noise *								
Climate change								
Cultural heritage								
Geology and soils								

Key	Interaction		Key areas of interaction		No interaction	

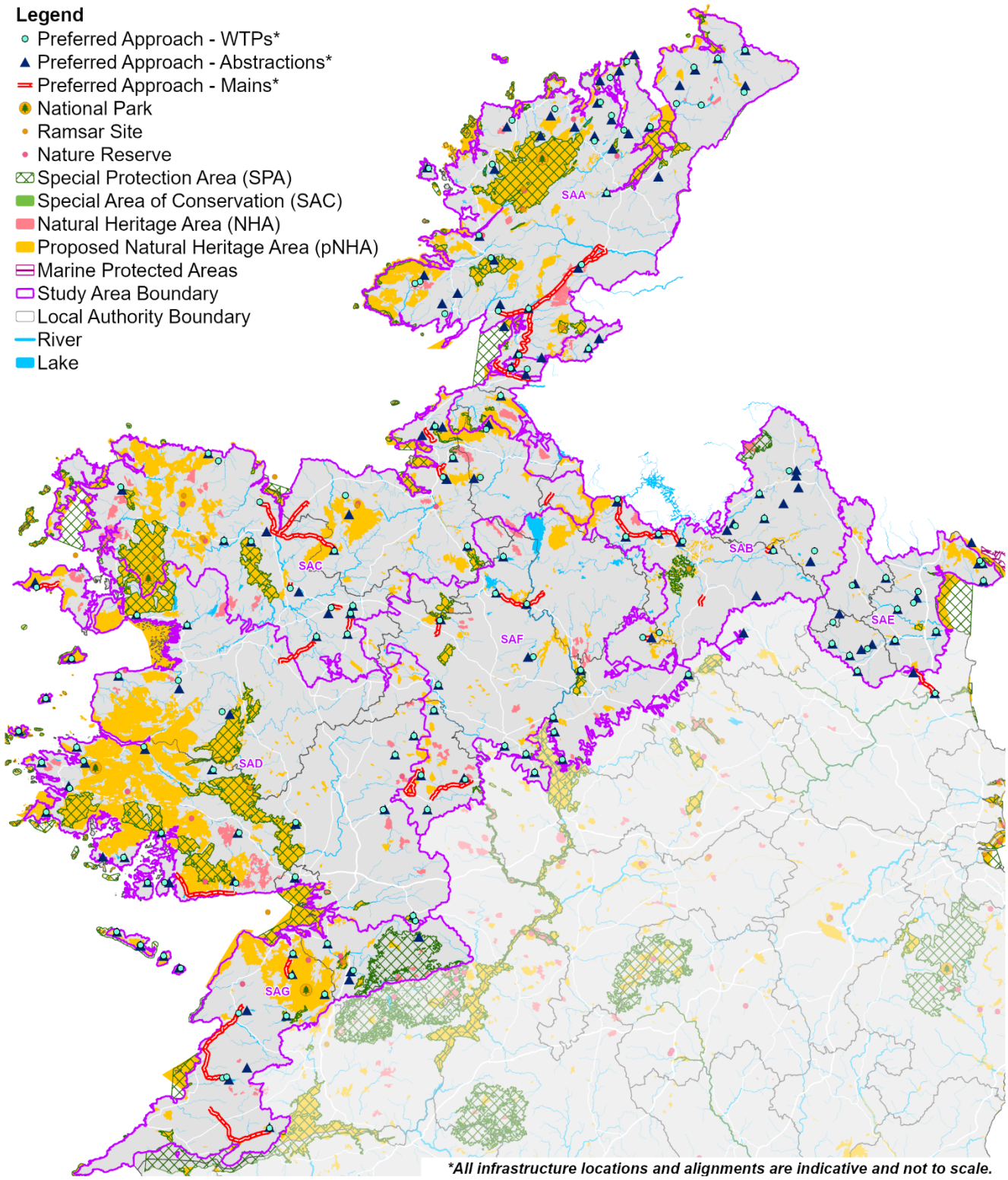


Figure NTS 5.2 Environmental Designations for the North West Region

Figure NTS 5.2 shows the environmental constraints for the RWRP-NW and Table NTS 5.2 presents the key issues and opportunities for the SEA topics. Key issues, trends and opportunities are addressed in each of the Study Area Environmental Reviews A-G (Appendix H of the SEA Report).

Table NTS 5.2 Key Issues and Opportunities

SEA Topic	Issues and Opportunities
Population, Economy, Tourism and Recreation, and Human Health	**Issues**: Increasing population and the increased stress of climate change on water quality and water resources could affect health and wellbeing. **Opportunities**: Uisce Éireann will put in place plans to assess water quality and put in place measures to address risks as part of the NWRP. Uisce Éireann has ongoing activities to improve the SDB across the North West Region, including, leakage management and water conservation measures. Raising awareness of the importance of water conservation and efficiency measures, and the value of the environment for health and wellbeing, can play an important part in water planning along with valuing water as part of access to environment for recreation.
Water Environment	**Issues**: The proposed abstraction licensing, aligned to Water Framework Directive requirements, will require many current abstractions to be licensed and may limit future abstraction or involve significant conditions at associated sites. Across the North West Region some of the existing abstractions are potentially unsustainable in the medium term; specifically, during drought periods. Uisce Éireann will need to update their sustainability analysis and impact on their baseline SDB calculations when regulatory assessment for new legislation is undertaken. Groundwater and flood risks and vulnerability are potential issues for water supply and environment. The plan assessment aims to identify strategic level risk but detailed siting and design through the project development stages is expected to take account. **Opportunities**: To take account of identified pressure on the water environment in the selection of solutions for individual study areas and opportunities for reducing pressures on resource and improving water quality.
Biodiversity, Flora and Fauna	**Issues**: It is considered especially important to avoid the loss of irreplaceable or rare terrestrial and aquatic habitats and increasing pressure on vulnerable species; potentially through direct land take or indirect such as through increased abstraction pressure. **Opportunities**: Potential for enhancement through reducing pressure on sensitive sites or building in requirements such as habitat enhancement in to schemes and identifying potential for nature-based solutions and catchment management.
Material Assets	**Issues**: WTP assets and network infrastructure requiring improvement or replacement. **Opportunities**: Improvements to support reliability of access to good quality water.
Landscape and Visual Amenity	**Issues**: Potential for climate change to affect land use and influencing landscape character, quality and amenity and potential for construction and infrastructure development to result in landscape and visual amenity change and loss of features. **Opportunities:** Potential to include enhancements in resintatement through appropriate planting schemes and screening.
Air Quality and Noise	No specific issues identified for the baseline for the North West Region related to the types of options and combinations under consideration for the Regional Plan. Therefore, air quality and noise were scoped out of the assessment at the scoping stage (see

SEA Topic	Issues and Opportunities
	section 3.8 of the SEA Scoping Report). Disturbances related to construction impacts are addressed in terms of receptors within the population and health topic.
Climate Change	**Issues**: Climate change issues regarding sea level rise, flooding, extreme weather events and changes in seasonal weather patterns. Climate change has been taken into account in supply forecasts and additional risks to infrastructure and operations will need to be taken into account in planning for drought and freeze/thaw events and in detailed scheme design and network operation. **Opportunities**: Additional management to minimise impact on supply and the environment, vulnerability to climate change and drought is required.
Cultural Heritage	**Issues**: Known cultural heritage, architectural heritage and archaeological assets and potential unknown archaeological assets could be affected by construction works or change to setting or access. Potential for hydrological changes to affect heritage and archaeological assets.
Geology and Soils	**Issues**: Potential loss of soils or pollution from runoff - general need for good soil conservation and retention of nutrients and carbon in soil resources. **Opportunities**: Improve soil carbon and retention of nutrients contributing to improving water quality.
Interactions between topics	Key interactions include links between biodiversity and water resources and climate change and between soils, land management, water quality, biodiversity, flood risk, and climate change.

6 SEA Assessment Methodology

6.1 Strategic Environmental Assessment Objectives

The set of SEA objectives developed for the Framework Plan SEA Phase 1 scoping stage have been refined and finalised following consultation (see Table NTS 6.1). These have been influenced by the plans, policies and programmes review, the baseline trends and pressures identified, and the scope of the assessment as defined in chapter 6 of the SEA Environment Report for the Framework Plan, the SEA Scoping Report for RWRP-NW and consultation comments.

The methodology for the assessment was developed in accordance with the following Environmental Protection Agency guidance:

- Developing and Assessing Alternatives in Strategic Environmental Assessment (SEA);
- Guidance on SEA Statements and Monitoring;
- Integrating Climatic Factors into SEA in Ireland - A Guidance Note;
- Good practice guidance on Cumulative Effects Assessment in SEA; and
- Guidance on the Authorisation of Direct Discharges to Groundwater[1].

[1] Guidance on the authorisation of direct discharges to groupdwater (2014) added in response to a EPA scoping comments although none of the options considered for the North West include groundwater discharges.

Table NTS 6.1 SEA Objectives

SEA Topic	SEA Objectives*
Population, economy, tourism and recreation, and human health	Protect and, where possible, contribute to enhancement of human health and wellbeing and to prevent restrictions to recreation and amenity facilities relating to the provision of water services.
Water environment	Water quality and quantity Prevent deterioration of the Water Framework Directive status of waterbodies with regard to quality and quantity due to Uisce Éireann's activities. Contribute towards the "no deterioration" Water Framework Directive condition and, where possible, to restore and improve waterbody status for rivers, lakes, transitional and coastal waters, and groundwater to meet Water Framework Directive objectives related to the provision of water services.
	Flood risk Protect and, where possible, reduce risk from flooding as a result of Uisce Éireann's provision of water services.
Biodiversity	Protect and, where possible, enhance terrestrial, aquatic and soil biodiversity; particularly regarding European sites and protected species in providing water services.
Material assets	Minimise resource use and waste generation from, new or upgraded, existing water services infrastructure and management of residuals from drinking water treatment - to protect human health and the ecological status of waterbodies. Minimise impacts on other material assets and existing as well as future water abstractions.
Landscape and visual amenity	Protect and, where possible, enhance designated landscapes in relation to the provision of water services.
Climate change	Climate change mitigation Minimise contributions to climate change emissions to air (including greenhouse gas emissions) as a related to the provision of water services.
	Climate change adaptation Promote the resilience of the environment, water supply and treatment infrastructure to the effects of climate change.
Cultural heritage	Protect and, where possible, enhance cultural heritage resources related to provision of water services.
Geology and soils	Protect soils and geological heritage sites and, where possible, contribute towards the appropriate management of soil quality and quantity.

*In response to scoping consultation comments, clarifications have been made to the Framework Plan SEA objectives to refer to 'water services' rather than activities provided by Uisce Éireann and also to the water environment objective to broaden this objective to include supporting WFD objectives where possible.

These high-level SEA objectives are used as the framework for the assessment of likely significant effects from the RWRP-NW compared to 'Without Plan' alternatives and also for each of the potential

water supply and demand options (construction and operational phases). The potential for mitigation of effects during plan implementation and for the different option types are considered.

6.2 Options and Approach Assessment Summary

The methodology applied and how the SEA objectives and environmental assessment has been integrated into the application of the methodology, is summarised below.

The methodology is based around an option development process consulted upon and finalised in the Framework Plan. The process aligns with the seven standard steps set out in the Department of Public Expenditure and Reform (2019) guidance document "Public Spending Code: A Guide to Evaluating, Planning and Managing Current Expenditure". For the NWRP methodology, there are eight key stages to the options assessment methodology which is applied:

1) Identifying need - based on Supply Demand Balance and/or Drinking Water Safety Plan Barrier Assessment.
2) Scoping of the Study Area (WRZs) – understanding the study area and the existing conditions of assets, supply and demand issues as well as environmental constraints and opportunities.
3) Identifying potential options for consideration relevant to the study area.
4) Coarse screening – assess the unconstrained options and eliminate any that will not be viable
5) Further option definition, information collection and preliminary costing.
6) Fine screening – options assessment and scoring against the key criteria with further removal of options identified as unviable and development of feasible options for costing (including environmental and social costs and benefits) and scoring assessment update.
7) Approach appraisal – comparison and assessment of combinations of options identified to meet the predicted supply demand deficit at WRZ, study area and Regional Group area level using Multi-Criteria Analysis to determine the Preferred Approach. Approaches tested include:
    - Least Cost;
    - Best Appropriate Assessment;
    - Quickest Delivery;
    - Best Environmental;
    - Most Resilient; and
    - Lowest Carbon.
8) Monitoring and Feedback into Plan – a feedback mechanism to ensure that the Framework Plan continuously adapts to changes such as evolving scientific data, understanding, and policy change in relation to the natural environment.

The SEA process has been applied across each of these steps as identified in Figure NTS 6.1 below.

The methodology is focused on ensuring that Uisce Éireann promote solutions that are resilient, environmentally and socially sustainable, and flexible to the changing environment and demands.

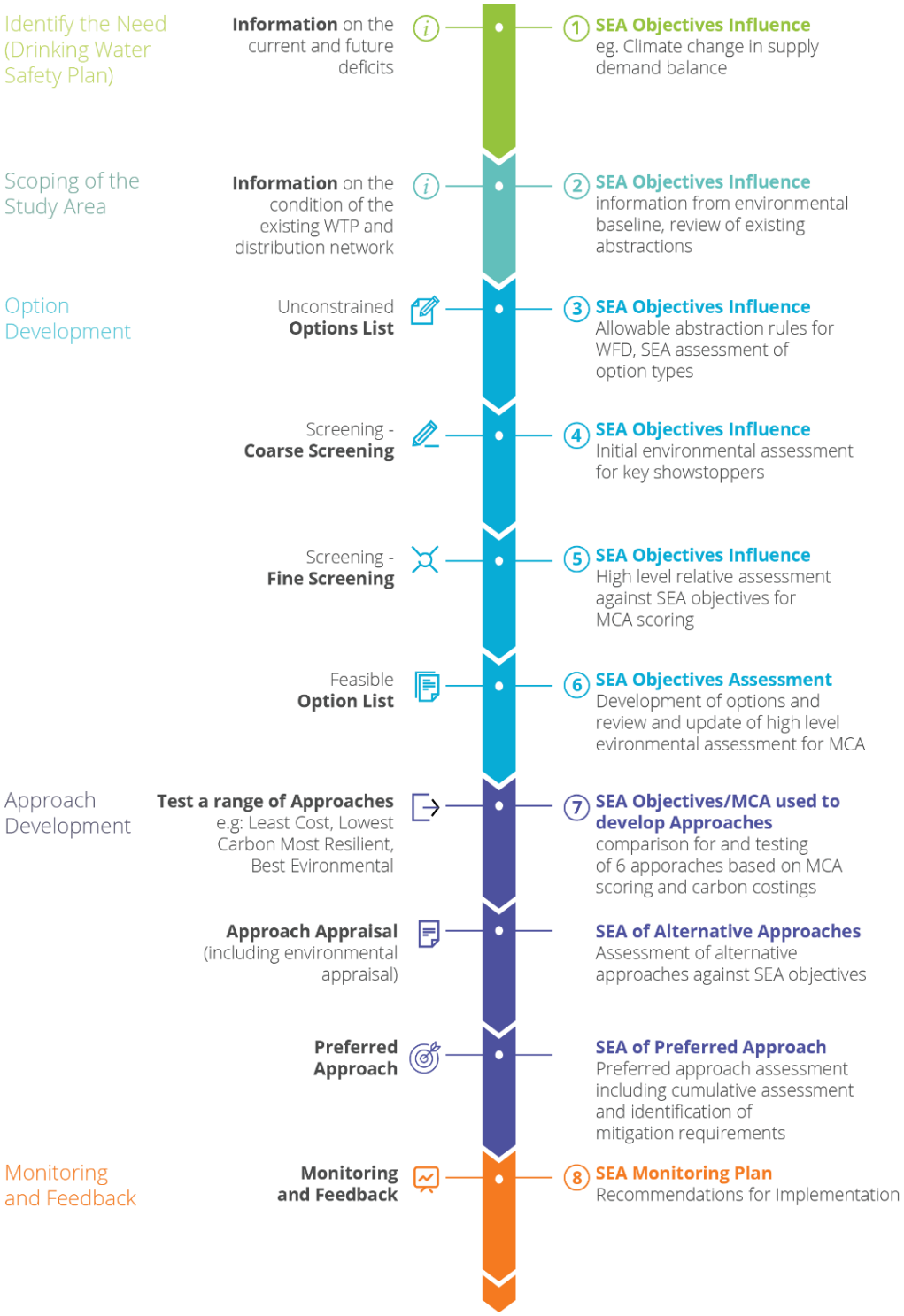


Figure NTS 6.1 Options Assessment and Preferred Approach

6.3 Stages 1, 2 and 3: Option Identification

The Supply Demand Balance and the Barrier Assessment inform the type and scale of options that Uisce Éireann must consider. Key option types are shown in Figure NTS 6.2. Sub-variants of each option type are also considered.

Environmental and social assessment criteria are included at the earliest stages of the screening process. At the outset of the process, some fundamental rules are applied as part of option identification. For example, inter-catchment raw water transfers are excluded due to the high risk of transferring invasive non-native species between catchments and potential conflict with Water Framework Directive objectives.

Water Framework Directive objectives have also been a key consideration at this stage through a sustainable abstraction risk review. This was a specialist review of groundwater bodies and surface water catchments that was undertaken as part of the option identification stage. UK Technical Advisory Group on the Water Framework Directive (UKTAG) guidance (UKTAG, 2013) on baseflows have been used until Ireland specific standards come into place.

The application of these conservative abstraction standards to new options ensures that any new or increased abstractions from rivers are likely to support conservation objectives for the most sensitive environmental sites. For surface waterbodies, the allowable abstraction standard of 10% of Q95 has been applied, with the exception of waterbodies requiring 'High' status where a higher threshold of 5% of Q95 has been applied. Allowable abstraction standards for lakes are set at 10% or 5% of Q50 in line with this guidance (the Natura Impact Statement sets out the approach in relation to Appropriate Assessment).

In the future, Uisce Éireann are likely to have to reduce or remove their unsustainable existing abstractions.

Figure NTS 6.2 Option

Based on these desk assessments, Uisce Éireann developed an initial list of unconstrained options for new supplies, increases and upgrades to existing supplies. An Unconstrained Options review workshop was held with Uisce Éireann's Local Authority Water Services Partners to identify any additional unconstrained options that might be available based on local knowledge.

6.3.1 Option Scale

Options to address the water supply deficits are developed at three different spatial scales:

- **WRZ Options** comprised of single or multiple options that can resolve the water supply deficit of a **single WRZ only**.
- **SA Options** comprised of single or multiple options that can resolve the water supply deficit of more than one WRZ within a single study area.
- **Regional Level** Feasible Options are assessed at the Regional Area level to see if there are any options, or combination of options, that can be applied across the entire Region.

The approach to developing options at the three different scales is described in further detail in section 6.1 of the RWRP-NW.

6.4 Stages 4, 5 and 6 - Option Screening

The Supply Demand Balance and Barrier Assessment (outlined in section 3 of the RWRP-NW) inform the type and scale of options that Uisce Éireann must consider.

Uisce Éireann identified ,1357 unconstrained options for the RWRP-NW.

The unconstrained options list was refined using a coarse screening assessment, which enables Uisce Éireann to rule out any non-viable options. This included removing options that could be identified at this stage as unsustainable or where significant environment impacts were considered likely and un-mitigatable. The remaining options known as “Constrained Options” were then carried forward for more detailed Multi Criteria Analysis at the Fine Screening stage.

The options were assessed against the SEA objectives and this was used as the basis for the Multi-Criteria Analysis scoring. The fine screening assessment could identify additional showstoppers and reasons for removing options.

Options passing through the fine screening were identified as Feasible Options and taken forward, with the Multi Criteria Analysis, for further assessment in the Approach Development phase.

No options were rejected after Fine Screening. A total of 539 options were rejected based on multiple criteria, including environmental sustainability issues.

6.5 Stage 7: Approach Development

The purpose of the Plan is to examine all potential options that could be used to meet the need and then to eliminate those that are not feasible or that have identifiable environmental issues (at a desktop level).

After fine screening the feasible options are assessed individually or as option combinations forming different potential approaches to identify the preferred option or combination of options to meet the need for each WRZ, study area and regional area.

A defined process has been identified to develop the Preferred Approach at the three spatial scales shown in Figure NTS 6.3.

The final stage is to assess any inter-regional options and potential cumulative or in combination effects and determine if any adjustment is required (this will be addressed sequentially in each of the Regional Plans in turn).

The Feasible Options, individually and in-combination, are tested to determine the Preferred Approach to meet the need across the three spatial scales. The options are tested against six Approach Categories which were selected to align the Framework Plan with all relevant Government Policy. The six Approach Categories are summarised in Table NTS 6.1.

Table NTS 6.1 The Six Approach Categories

Approaches Tested	Description
Least Cost	Lowest Net Present Value cost in terms of Capital, Operational, Environmental and Social, and Carbon Costs.
Best Appropriate Assessment	Lowest score against the European Sites (Biodiversity) sub criteria question based on assessing the option as having either no Likely Significant Effects, Likely Significant Effects that can be addressed with general/standard mitigation measures or Likely Significant Effects that may be more difficult to mitigate. For options scoring -3, potential alternative higher scoring options are sought where possible.
Quickest Delivery	Based on an estimate of the time taken to bring an option into operation (including typical feasibility, consent, construction and commissioning durations) as identified at Fine Screening. This is particularly relevant where an option might be required to address an urgent Public Health issue (potential benefit for SEA Objective on population and public health).
Best Environmental	This is the option or combination of options with the highest total score across the 19 SEA objective criteria Multi Criteria Analysis questions. In addition, high risk -3 issues are considered against individual criteria focusing on long term operational effects.
Most Resilient	This is the option or combination of options with the highest total score against the resilience criteria. (Link to SEA Objective for climate change adaptation for environment).
Lowest Carbon	This is the option or combination of options with the lowest embodied and operational carbon cost.

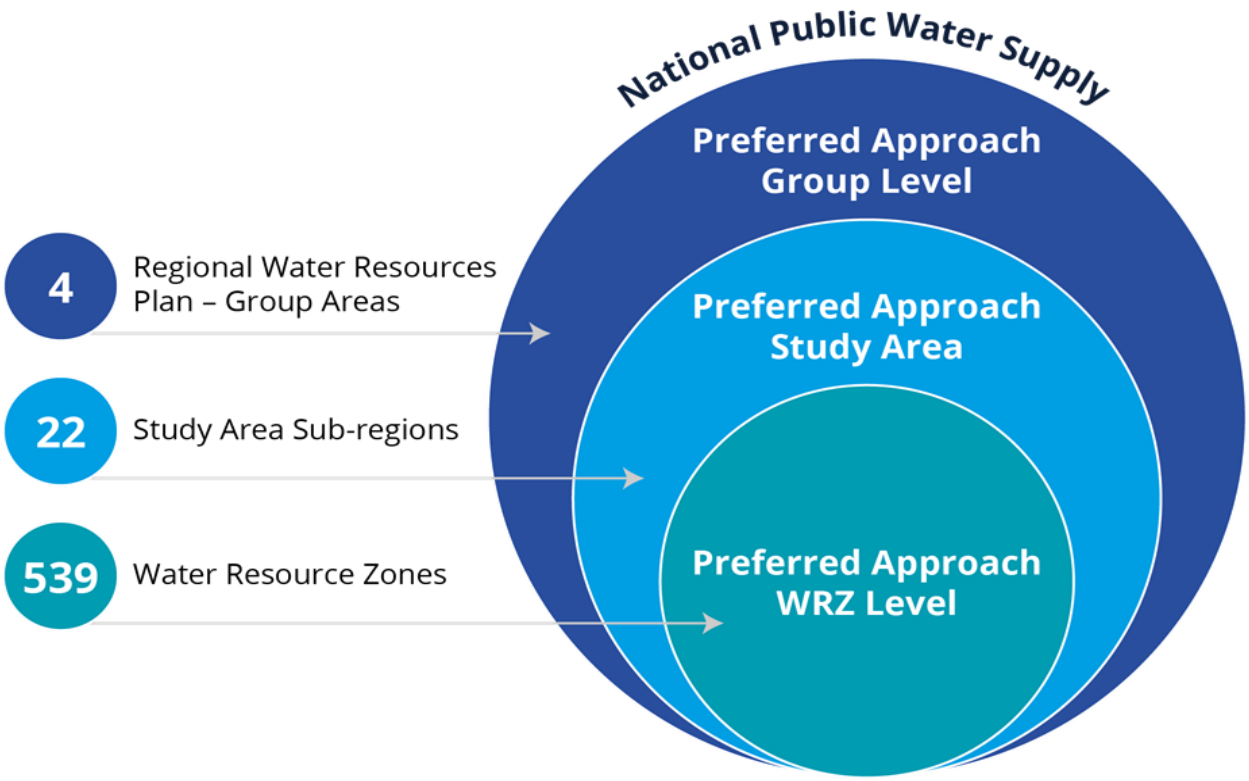


Figure NTS 6.3 National Water Resources Plan Spatial Scale of Assessment

7 Study Area SEA Summaries

Table NTS 7.1 gives an overview for each study area of how options numbers were reduced from the unconstrained long list to the feasible options list through the screening process. The table also sets out the number of potential combinations that were identified that could meet the study area need for supply and water quality over the plan period.

Table NTS 7.1 Study Area Summary of Assessment

Study Area Description
Study Area A - lies within the county of Donegal, including Arranmore Island, and has a total area of approximately 4,650 km2. The principal settlement (with a population of over 10,000) within SAA is Letterkenny (CSO, 2016).
Study Area B - total area is approximately 2,780 km2 and lies within the counties of Cavan, Monaghan, Leitrim, Longford, Donegal and Sligo. The principal settlement (with a population of over 10,000) within SAB is Cavan (CSO, 2016).
Study Area C - total area is approximately 5,150 km^2 and lies within the counties of Mayo (including Achill Island), Sligo, Leitrim, Cavan, and Roscommon. There are three principal settlements (with a population of over 10,000) within SA-C, namely Sligo, Castlebar and Ballina (CSO, 2016).
Study Area D - lies within the counties of Galway, Galway City, Mayo and Roscommon, including several islands off of the coast of Ireland such as the Aran Islands (Inishmore, Inishmean, Inishere), Inisboffin, Inishturk and Clare Island, and has a total area of approximately 6,720 km^2. There are two principal settlements (with a population of over 10,000) within SAD, namely Galway city and suburbs, and Castlebar (CSO, 2016).
Study Area E - lies within the counties of Louth, Monaghan, Meath, and Cavan, and has a total area of approximately 1,260 km^2. There are two principal settlements (with a population of over 10,000) within SAE, namely Drogheda, and Dundalk (CSO, 2016).
Study Area F - lies within the counties of Roscommon, Leitrim, Longford, Galway, Sligo, Cavan, Mayo and Westmeath, and has a total area of approximately 3,990 km^2. There is one principal settlement (with a population of over 10,000) within SAF, namely Longford (CSO, 2016).
Study Area G - lies within the counties of Clare and Galway, and has a total area of approximately 2,390 km^2. The largest settlement is Gort, with a population of 2,994 settlement (CSO, 2016).

Study Area	SAA	SAB	SAC	SAD	SAE	SAF	SAG
Unconstrained	350 options	194 options	214 options	281 options	63 options	175 options	80 options
Coarse & Fine Screening	159 rejected; 138 rejected on sustainability reasons	73 rejected; 22 rejected on sustainability reasons	78 rejected; 53 rejected on sustainability reasons	108 rejected; 33 rejected on sustainability reasons	25 rejected; 14 rejected on sustainability reasons	52 rejected; 14 rejected on sustainability reasons	44 rejected; 19 rejected on sustainability reasons
Feasible Options	191 options	121 options	136 options	173 options	38 options	123 options	36 options
No. of approach Combinations	13 combinations	6 combinations	12 combinations	22 combinations	12 combinations	14 combinations	9 combinations

Preferred Approach Assessment		
SEA objectives	**Potential Construction Impact** **SAA - SAG**	**Potential Operational Impact** **SAA - SAG**
1) Public Health	Neutral to Major Adverse	Moderate Adverse to Moderate Beneficial
2) Biodiversity	Neutral to Major Adverse	Neutral to Moderate Adverse
3) Landscape and Visual	Neutral to Major Adverse	Minor Adverse to Moderate Beneficial
4) Materials	Neutral to Major Adverse	Neutral to Moderate Adverse
5) Greenhouse Gas	Neutral to Major Adverse	Neutral to Major Adverse
6) Climate Change	Neutral to Moderate Adverse	Moderate Adverse to Moderate Beneficial
7) Surface Water/ Groundwater	Neutral	Neutral to Major Adverse
8) Flood Risk	Minor Adverse to Minor Beneficial	Neutral to Minor Beneficial
9) Cultural Heritage	Neutral to Moderate Adverse	Neutral
10) Geology and Soils	Neutral to Moderate Adverse	Neutral to Minor Adverse
Cumultative effects and mitigation		
Potential significant impacts identified for specific options for public health, biodiversity, landscape and visual and water environment reflect uncertainty and need for further investigation and mitigation to ensure significant effects are avoided. Cumulative effects identified include combined carbon emissions from embodied and operational carbon. A range of mitigation measures and additional studies and investigations are recommended for individual options and cumulative effects are set out in the SEA Environmental Report, Appendix D, and section 10: Environmental Action Plan and Monitoring Plan		

The Multi Criteria Anaylsis scoring and cost information were used to test the combinations against each of the six categories (including the best environmental, lowest carbon and best appropriate assessment (Best AA) categories) to identify the best performing approaches. Some combinations performed best across more than one category, hence the number of approaches identified for each study area can be less than six.

The approaches were compared through the 7 step process (See Figure NTS 7.1) applied through a workshop to identify the overall best value approach identified as the Preferred Approach. This used the Multi-Criteria Analysis scoring and cost information and took account of how significant the differences were between approaches.

STEP 0 Best AA	If there is an option that meets the Objectives of the Plan, and is assessed as having no potential impact on a European Site (based on desktop assessment), it is automatically adopted as the Preferred Approach
STEP 1 Least Cost	Compare Least Cost against **best AA** Approach, and consider again at Step 6
STEP 2 Quickest Delivery	Compare Least Cost against Quickest Delivery Approach and develop Modified Approach if appropriate
STEP 3 Best Environmental	Compare Least Cost or Modified Approach against Best Environmental, and modify approach **if appropriate**
STEP 4 Most Resilient	Compare Least Cost or Modified Approach against Most Resilient
STEP 5 Least Carbon	Compare Least Cost or Modified Approach against **Lowest** Carbon
STEP 6 Approach Comparison	Compare output from Steps 1 to 5 against: • SEA required outcomes • **Best AA outcomes** • Sectoral Adaptation Outcomes • Public Expenditure Code Outcomes
STEP 7 Preferred Approach	Select Preferred Approach based on steps 0 to 6

Figure NTS 7.1 The 7 Step Process

The application of the three stage Approach Development Process resulted in the Preferred Approach at Study Area Level comprising 24 SA Options that collectively supply 119 WRZs across the North West Region (Table NTS 7.2). This creates an interconnected network and allows Uisce Éireann to rationalise infrastructure providing a more resilient supply to customers. There is also the benefit of moving away from some potentially unsustainable abstractions by reducing abstraction points. The assessment of supplies at a Study Area Level allows consideration of regional sustainability of the abstractions. This rationalisation is described further in section 7.3 of the RWRP-NW.

Table NTS 7.2 Study Area Preferred Approach

Study Area	Number of WRZs	SA Preferred Approach		Number of WRZs benefitting from an SA Option
		WRZ Option	SA Option	
SAA	21	5	3	16
SAB	23	17	4	8
SAC	17	11	3	6
SAD	25	14	4	11
SAE	9	7	2	2
SAF	15	12	2	3
SAG	9	4	3	5
Region Total	**119***	**70**	**21**	**51**

Option types include new and/or increased groundwater and surface water abstractions, interconnections, rationalisations (connection of Water Treatment Plants and/or WRZs), usually accompanied by decommissioned abstractions and WTPs), Group Water Scheme imports and maintenance of supply, desalination, transboundary imports (from Northern Ireland), and/or transfers from sources within or outside of the Study Area. The number of options that only comprise a Water Treatment Plant water quality upgrade is also presented for those WRZs that are not in deficit and therefore do not require a new or upgraded resource supply.

Table NTS 7.3 Study Area Level Preferred Approach Selection

Study Area	SA Preferred Approach Selection Summary
SAA	**The PA is the Best Environmental Approach.** • The PA for SAA includes 3 SA options and 5 WRZ options that supply the deficit across all WRZs. There are no feasible WRZ Options for four WRZs in the Study Area. For this reason, the WRZ Level Approach can meet the deficit for only 17 of the 21 WRZs. • The PA decommissions 10 abstraction sources compared with three decommissioned abstractions under the WRZ Level Approach. The PA has the advantage of requiring 6 fewer

Study Area	SA Preferred Approach Selection Summary
	new or increased abstractions. Therefore has a lower impact on biodiversity and the water environment. • The interconnected Options of the PA will require an estimated 132 km more pipeline than the WRZ Options and will reduce the number of WRZs from 21 to 6. • The PA has an estimated NPV cost that is 11% higher than WRZ Level Approach. The increased costs are associated with the additional pipeline length and water storage infrastructure and the additional works required to secure supply to four more WRZs. • The PA has one high-risk Option under the Appropriate Assessment that will require further assessment at project level to confirm mitigation opportunities. This includes the rationalisation and interconnection of seven WRZs to Letterkenny, which involves an increased abstraction from the River Crana and new abstractions from Gartan Lough and Glen Lough. • The better environmental score for the PA is associated with the lower materials and waste impacts due to the rationalisation of assets. The PA is also likely to have a lower landscape impact as it requires less abstractions and WTPs. Benefits to the water environment are also achieved through the abandonment of 10 abstractions (nine of which may not meet sustainability guidelines during dry weather flows). Cessation of abstractions from these sources are likely to improve water quality and benefit water dependent biodiversity including aquatic ecology.
SAB	**The PA is the Least Cost, Lowest Carbon, Best Environmental and Best AA Approach.** • The PA for SAB comprises 4 SA options and 17 WRZ options compared with 25 WRZ Options for the WRZ Level Approach. Both approaches can meet the deficit across all WRZs in the study area. • The PA provides the following advantages compared to the WRZ Level Approach: four fewer new or upgraded abstractions, three more decommissioned WTPs and three more decommissioned abstractions. Additionally, the PA Approach requires three fewer upgraded WTPs and no new WTPs. • The interconnected Options of the PA will require an estimated 22 km more pipeline than the WRZ Options and will reduce the number of WRZs from 23 to 18. The PA will require two fewer water storages. • The PA has been selected as the Lowest Carbon, Best Environmental and Best AA Approach due to the reduced infrastructure requirements. The Best AA score is based on the PA having the lowest number of negative AA impacts. • The NPV cost is estimated to be 10% less than the WRZ Level Approach. This cost benefit is the result of lower capital expenditure due to fewer new and increased WTPs; as well as lower operational costs associated with the reduced number of WTP • The PA has no high-risk Option that could impact on European sites, which will require further assessment at project level. • The better environmental score for the PA is associated with the lower materials and waste impacts due to the rationalisation of assets. The PA is also likely to have a lower landscape impact as it requires fewer water storages and abstractions. Benefits to the water environment are also achieved through the abandonment of four abstractions (one of which may not meet sustainability guidelines during dry weather flows). Cessation of abstractions from these

Study Area	SA Preferred Approach Selection Summary
	sources has potential to improve water quality and benefit water dependent biodiversity including aquatic ecology. • The PA has a relatively long delivery timescale when compared with the other SA combinations. However, the low score in this category is outweighed by the significant gains in overall environmental improvement, ranking highest for carbon. • The SA options of the PA merge WRZs through interconnections and rationalisation. This improves the resilience score of the PA compared with the independent local solutions that make up the WRZ Level Approach.
SAC	**The PA is the Least Cost and Lowest Carbon Approach.** • The PA for SA-C includes 3 SA options and 11 WRZ options that supply the deficit across all WRZs. The WRZ Level Approach can only meet the deficit for 16 of the 17 WRZs, as there are no feasible WRZ Options for one of the WRZs. • The PA decommissions two additional abstraction sources and one additional WTP. It also has the advantage of requiring 10 fewer new or increased abstractions and two fewer new WTPs. The PA Approach therefore has a lower impact on biodiversity and the water environment. The PA requires only 7 km additional pipeline compared to the WRZ Level Approach. • The PA has been selected as the Least Cost Approach. The NPV cost is estimated to be 6% lower than the WRZ Level Approach. This is mostly attributed to the lower capital expenditure, due to the PA requiring fewer new and upgraded WTPs and abstractions. • The PA has only two high-risk Options that could impact on European sites, which will require further assessment at project level to confirm mitigation opportunities. The first Option involves an increased groundwater abstraction from Belmullet groundwater body to supply the deficit in Ceide Fields WRZ. The second Option involves a new surface water abstraction from Keel Lough to supplement Accorymore Lake during dry periods. • The high environmental score for the PA is associated with the lower materials and waste impacts due to the reduction in water storage requirement and reduced requirement for new abstractions. Benefits to the water environment are also achieved through the abandonment of six abstractions, particularly as four of these abstractions may not meet sustainability guidelines during dry weather flows. Cessation of abstractions from these sources has potential to improve water quality and benefit water dependent biodiversity, including aquatic ecology.
SAD	**The PA is the Least Cost and Lowest Carbon Approach.** • The PA for SAD includes 4 SA options and 14 WRZ options that supply the deficit across all WRZs. The WRZ Level Approach can meet the deficit for only 24 of the 25 WRZs, as there were no feasible WRZ Options for one of the WRZs. • The PA requires seven fewer WTP upgrades and two fewer new WTPs and decommissions an extra eight WTPs and four additional abstraction sources. It also has the advantage of requiring five fewer new or increased abstractions and therefore has a lower impact on biodiversity and the water environment. • The PA has been selected as the Least Cost Approach compared with other study area Option combinations. Compared with the WRZ Level Approach, the estimated NPV cost is 6% higher. The increased costs are associated with the 106 km additional pipeline length and water storage infrastructure and the additional works required to secure supply for one more WRZ. • The PA has five high-risk Options that could impact on European sites, which will require further assessment at project level to confirm mitigation opportunities. This is associated with

Study Area	SA Preferred Approach Selection Summary
	four new/increased abstractions which could impact SAC's/SPA's and the construction of a desalination plant which could have impacts on mobile marine mammals. • The better environmental score for the PA is associated with the lower materials and waste impacts due to the rationalisation of assets. Substantial benefits to the water environment are also achieved through the abandonment of 12 abstractions, particularly as 11 of these abstractions may not meet sustainability guidelines during dry weather flows. Cessation of abstractions from these sources has potential to improve water quality and benefit water dependent biodiversity including aquatic ecology. • The PA has increased risks due to the number of high-risk Options when compared across all 21 SA Combinations; however, all combinations were associated with at least two -3 Scores and the risk of the PA SA Combination is outweighed by the significant benefits relating to reduced carbon, cost and delivery time.
SAE	**The PA is the Least Cost, Quickest Delivery and Best AA Approach.** • The PA for SAE, includes 2 SA options and 7 WRZ options, that supply the deficit across all WRZs. The WRZ Level Approach can only meet the deficit for 8 of the 9 WRZs, as there are no feasible WRZ Options for one of the WRZs. • The PA provides the following advantages compared to the WRZ Level Approach: it requires approximately 4 km less of pipeline, decommissions two additional WTPs and three abstraction sources and requires 2 less WTP upgrades. • The PA has been selected as the Least Cost Approach overall when performance against other Approach Categories is also considered. Although the NPV is higher than WRZ Level Approach, it is within 5% and the PA secure the supply to one additional WRZ. • There are no high-risk Options that could impact on European sites associated with the PA. Four of the Options have a -1 AA score while the remaining five Options have been assessed to have no AA impacts. For this reason, when compared with the other Option combinations, the PA was selected as the Best AA Approach. • The approach is comparable to the WRZ Level Approach in terms of numbers of new and decommissioned abstractions/WTPs but the Approach can be delivered on a shorter timescale at less cost. Substantial benefits to the water environment are also achieved through the abandonment of four abstractions. One of these abstractions may not meet sustainability guidelines during dry weather flows. Cessation of abstractions from these sources has potential to improve water quality and benefit water dependent biodiversity including aquatic ecology. • The PA is less resilient when compared across all 12 SA Combinations; however, the low score in this category is outweighed by the significant gains in terms of environmental benefits, delivery and cost.
SAF	**The PA is the Quickest Delivery Approach.** • The PA for SAF includes 2 SA options and 12 WRZ options that supply the deficit across all WRZs. • The PA decommissions one more WTP and two more abstraction than the WRZ Level Approach. It requires one less WTP upgrade and two fewer new/upgraded abstractions and therefore has a lower impact on biodiversity and the water environment. It also requires one less water storage. The PA requires a similar length of pipeline as the WRZ Level Approach.

Study Area	SA Preferred Approach Selection Summary
	• Compared with the WRZ Level Approach, the estimated NPV cost is 7% higher. The increased costs are associated with the additional pipeline length required to interconnect supply systems. • The PA has two high-risk Options that could impact on European sites, which will require further assessment at project level to confirm mitigation opportunities. This is associated with the increased groundwater abstraction at Gortgarrow Spring and the rationalisation of Kilkerrin/Moylough and Dunmore/Glenmaddy P.S, as well as the construction of a new intake from the middle Lake to meet the demand in North Roscommon RWSS. • The PA has two more Options with -3 AA scores than the combination of options selected as the Best AA Approach; however, this is outweighed by the significant gains in cost and delivery. Although the Best AA Approach had no -3 AA impacts, it was associated with the development of a more vulnerable local groundwater source for Kilkerrin. The PA allows the development of a more secure source for Kilkerrin, which is also proposed as a solution for Glenamaddy in Study Area D and hence the risk is only counted once across the region. The other -3 AA impact is related to an abstraction at Lough Gara which is linked to an existing abstraction and so mitigations can be developed at short, medium and long timescales.
SAG	**The PA is the Least Cost and Quickest Delivery Approach.** • The PA for SAG, includes 3 SA options and 4 WRZ options, compared with 9 WRZ Options for the WRZ Level Approach. Both approaches can meet the deficit across all WRZs in the study area. • The PA decommissions two additional WTPs and two additional abstraction points. It requires two fewer new WTPs, two fewer WTP upgrades, three fewer new/upgraded abstractions and one less water storage. The PA therefore has a lower impact on biodiversity and the water environment. The PA requires approximately 39 km more of pipeline compared to the WRZ Level Approach. • The PA has been selected as the Least Cost Approach overall. The total NPV cost is estimated to be 16% less than WRZ Level Approach due to the smaller infrastructure requirements. • The PA has no high-risk Options that could impact on European sites. • The PA has a slightly lower environmental score than the Best AA Approach, however, the Best AA Approach would require boring through rock over a long distance and so the PA was maintained as this was considered more problematic than the increased cost and carbon. The PA is also likely to have a lower landscape impact as it requires less abstractions and decommissions more existing abstractions. Benefits to the water environment are achieved through the abandonment of three abstractions, particularly as two of these abstractions may not meet sustainability guidelines during dry weather flows. Cessation of abstractions from these sources has potential to improve water quality and benefit water dependent biodiversity including aquatic ecology.

7.1 Leakage Proposals

Leakage reduction measures are a key component of the Preferred Approach to addressing Need across the North West Region. Uisce Éireann's current leakage targets are to reduce leakage in supplies with demand greater than 1.5Ml/day. Supplies of greater than 1.5Ml/day are found in various locations around the North West Region and the leakage targets equates to a total leakage reduction of 102 Ml/day, which will reduce leakage to 26% of demand across the entire region.

The leakage reductions are assessed as contributing to meeting SEA objectives, especially for climate change and carbon, through energy and treatment savings and through reducing water required for

abstraction. Construction impacts for works such as mains replacement can include traffic disruption, community disturbance and temporary land take, landscape and biodiversity impacts and water pollution risks but these are generally short term and mitigatable with appropriate construction management and reinstatement commitments.

7.2 Water Framework Directive and Surface Water Abstractions

Uisce Éireann's assessment identified 72 existing surface water sites where potential abstraction reductions may be required in the future, based on conservative estimates of what a future regime may require. These sites are shown in Figure NTS 7.2 which presents the changes to surface water abstractions under the Preferred Approach development, including new abstractions and existing abstractions which will be maintained, upgraded or abandoned.

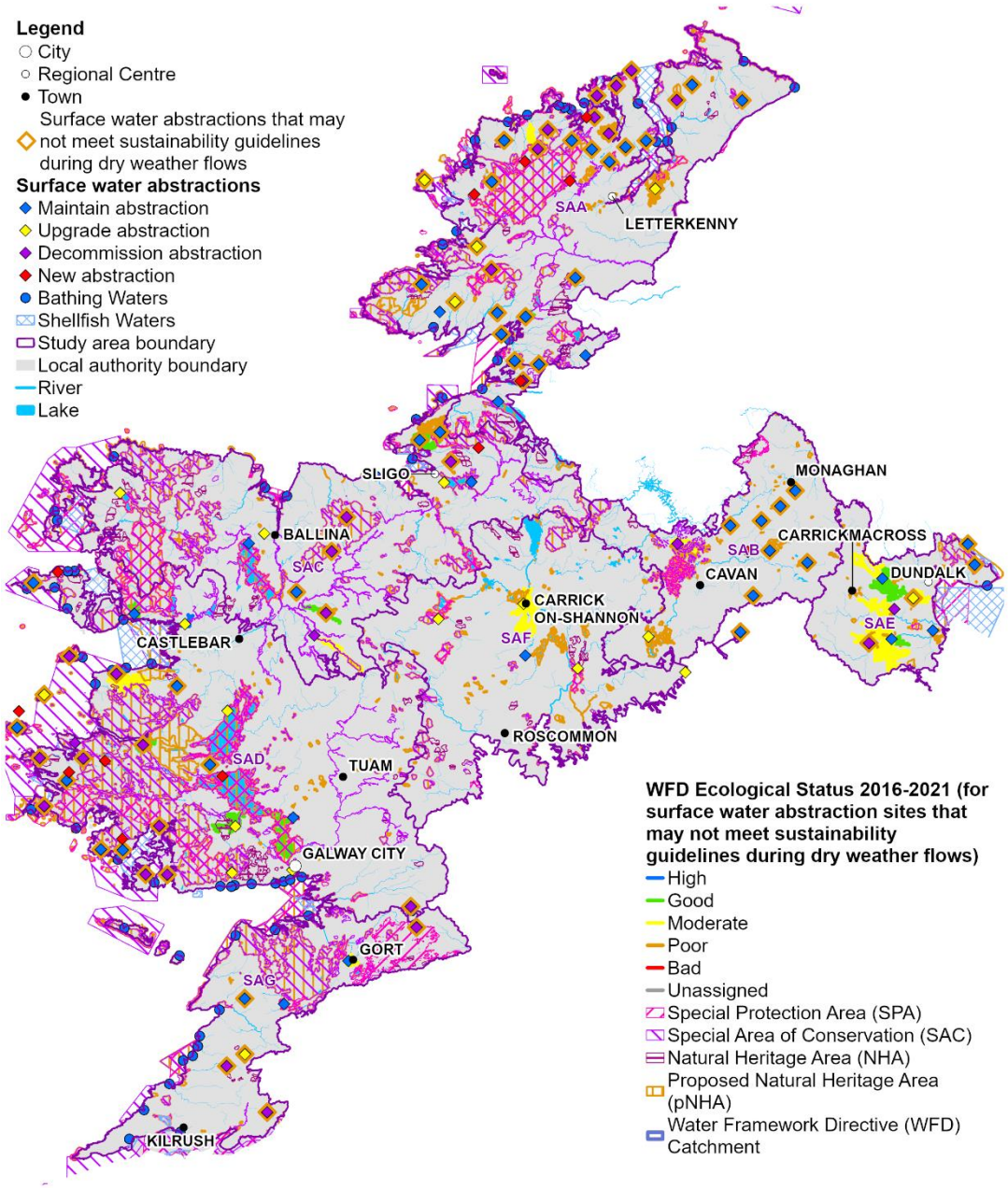


Figure NTS 7.2 Preferred Approach – Surface Water Abstractions

Table NTS 7.4 Preferred Approach – Existing Surface Water Abstractions Potentially Exceeding Sustainable Abstraction Thresholds

Preferred Approach Outcome	Abstraction Sites						
	SAA	SAB	SAC	SAD	SAE	SAF	SAG
Decommission	9	1	4	11	1	0	2
Maintain	16	8	4	6	2	0	1

Groundwater abstractions will need to conform to the proposed new abstraction licencing regime as well. Due to the limited long-term records on pumping and drawdown of water levels for many of Uisce Éireann's groundwater supplies, it is difficult to present robust desktop assessments of water availability for their existing groundwater abstractions. Until site-specific studies of groundwater availability are completed, Uisce Éireann have developed an initial assessment for existing abstractions based on best available information.

Figure NTS 7.3 shows the groundwater abstraction sites in the Preferred Approaches that will benefit from proposed decommissioning.

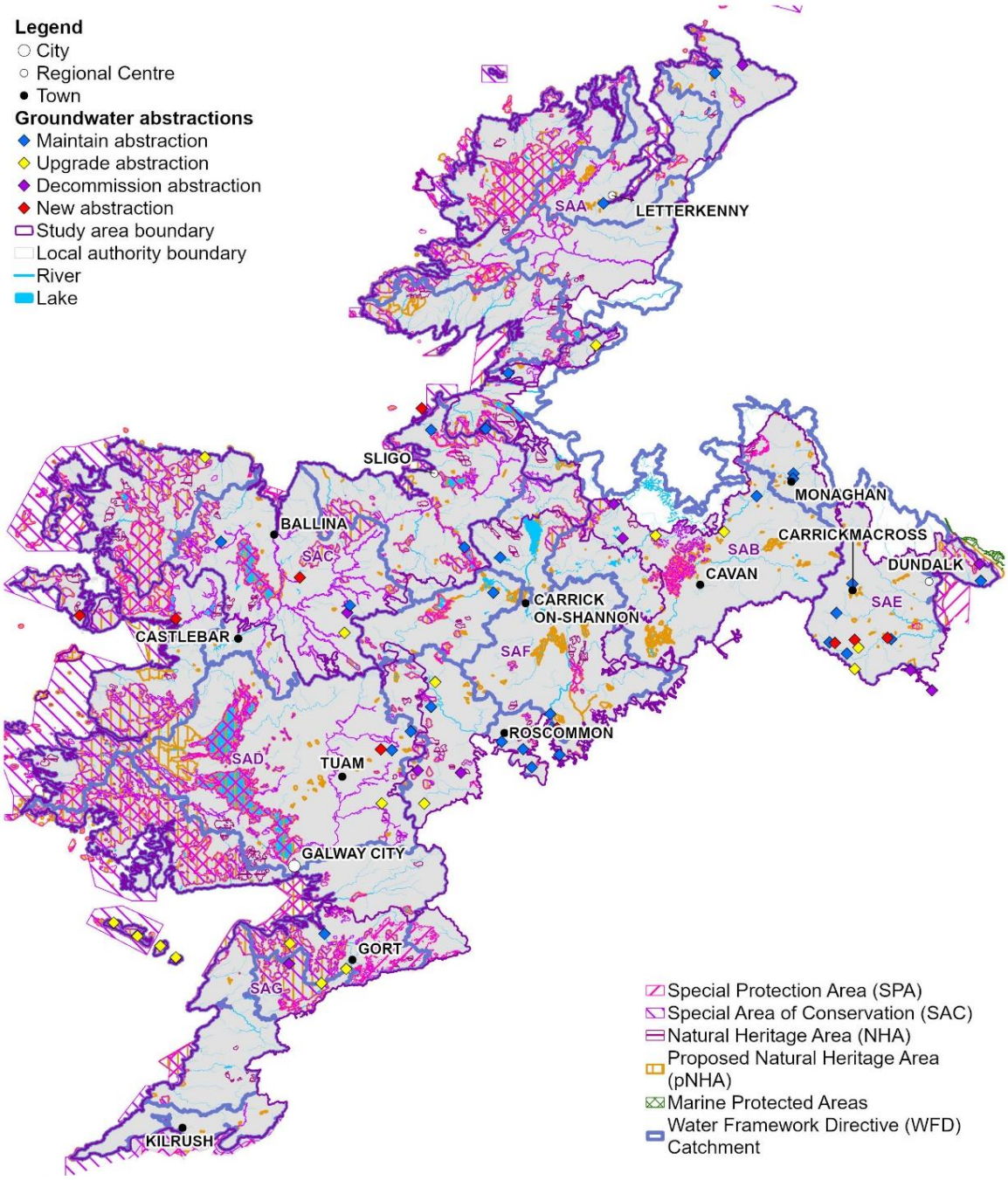


Figure NTS 7.3 Preferred Approach – Groundwater Abstractions

8 Regional Approach for the RWRP

The Regional Preferred Approach considers, at a plan level, what projects/solutions might work best to meet the overall deficit in the North West Region. Taking a holistic view of the region presents opportunities to improve the sustainable water resources management and increase operational flexibility and resilience.

While some small Cross Study Area Transfers have been identified, including an inter-regional supply, the potential for a large feasible option with the capability to provide regional interconnectivity (across study area boundaries) is limited due to the terrain across the North West Region and constrained by the location of environmentally sensitive site and the sustainability of the water sources. For this reason, the Study Area Preferred Approach that is presented in section 7 is identified as the 'Best Value' solution to address the regional water supply Need. The Regional Preferred Approach is therefore defined as the

combination of the seven Study Area Preferred Approaches for the North West Region. These approaches are listed in Appendix C of the SEA Environmental Report.

The Approach Development Process at Study Area Level, identified large, interconnected supplies within the study area boundaries which will ultimately increase resilience of supply for customers and support environmental sustainability in the long term. These works are associated with extensive construction works for which will have environmental impacts and risks. These have been assessed for each option in the Study Area Environmental Reviews in Appendix H of the SEA Environmental Report.

9 Cumulative Assessment for RWRP-NW

A cumulative effects assessment for a water resource management plan should include:

- Effects of measures/options proposed within a plan or programme; and
- Effects between the measures/options proposed within the plan or programme and other projects, plans and programmes.

At the Regional Level, cumulative effects need to be considered in relation to the combined effects from proposals in the seven component study areas of the North West regional group area ‘within plan’ and includes consideration of the transfers across study areas and inter regional transfers.

For cumulative effects to occur, there needs to be an overlap of temporal periods in some way for the impacts and/or the effect. For example, two strategic-level schemes being constructed at the same time could result in cumulative traffic movements, while two schemes being operated together could result in a drawdown of groundwater levels. A precautionary approach has been taken for the cumulative effects assessment, which assumes that all options could be constructed at the same time and then all options would be operated at the same time.

The assessment has considered the cumulative effects across all SEA topics to identify those interactions that are likely to generate significant effects. These are likely to be related to:

- Biodiversity;
- Water environment;
- People and health;
- Landscape and visual;
- Cultural heritage; and
- Climate change.

9.1 Cumulative Effects 'Within Plan'

9.1.1 Overview

The Preferred Approaches across the seven study areas are shown in relation to environmental constraints in Figure NTS 9.1 and Figure NTS 9.2. Option locations and transfer routes are identified.

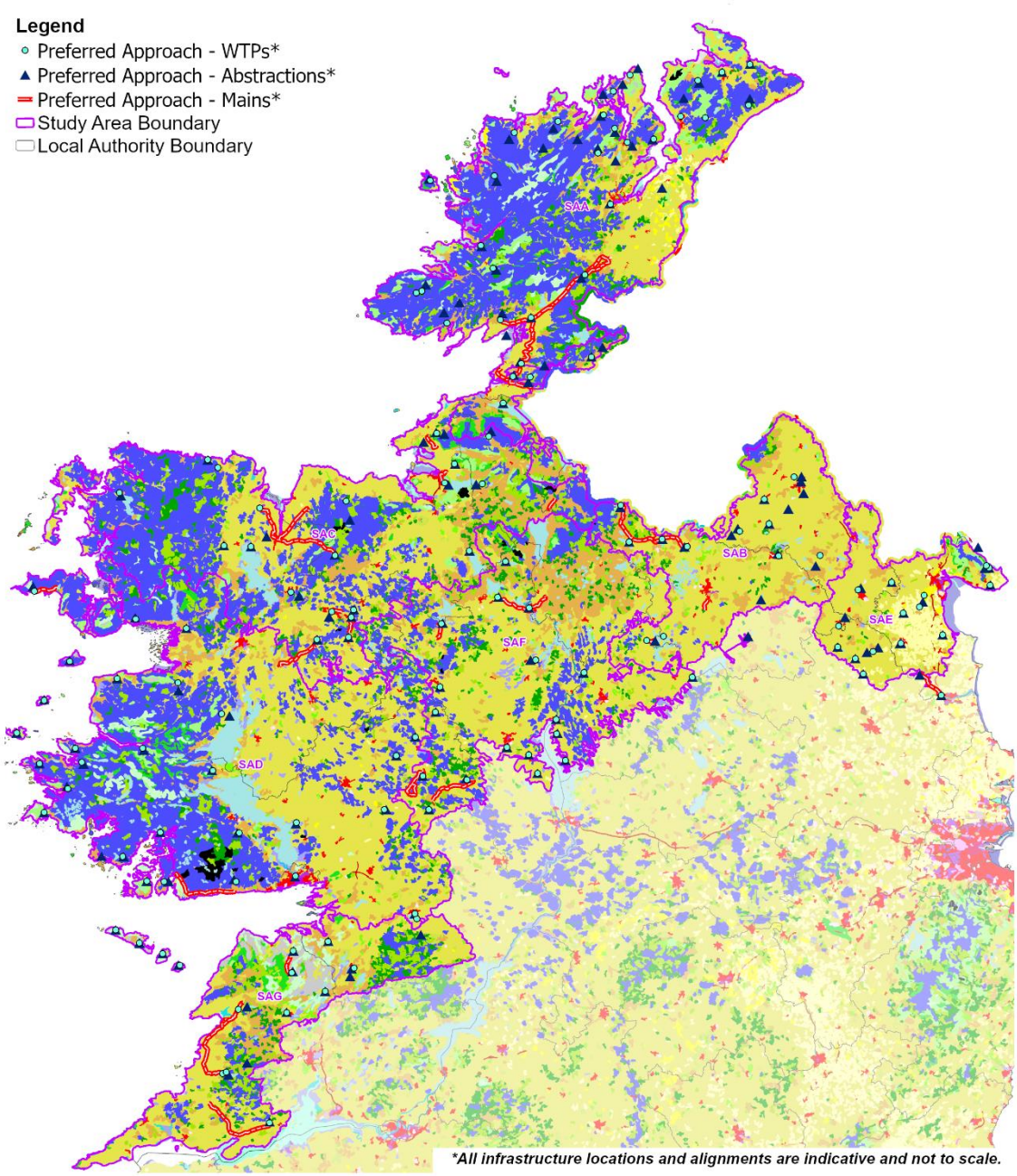


Figure NTS 9.1 Corine Land Cover Analysis for the Nouth West Region

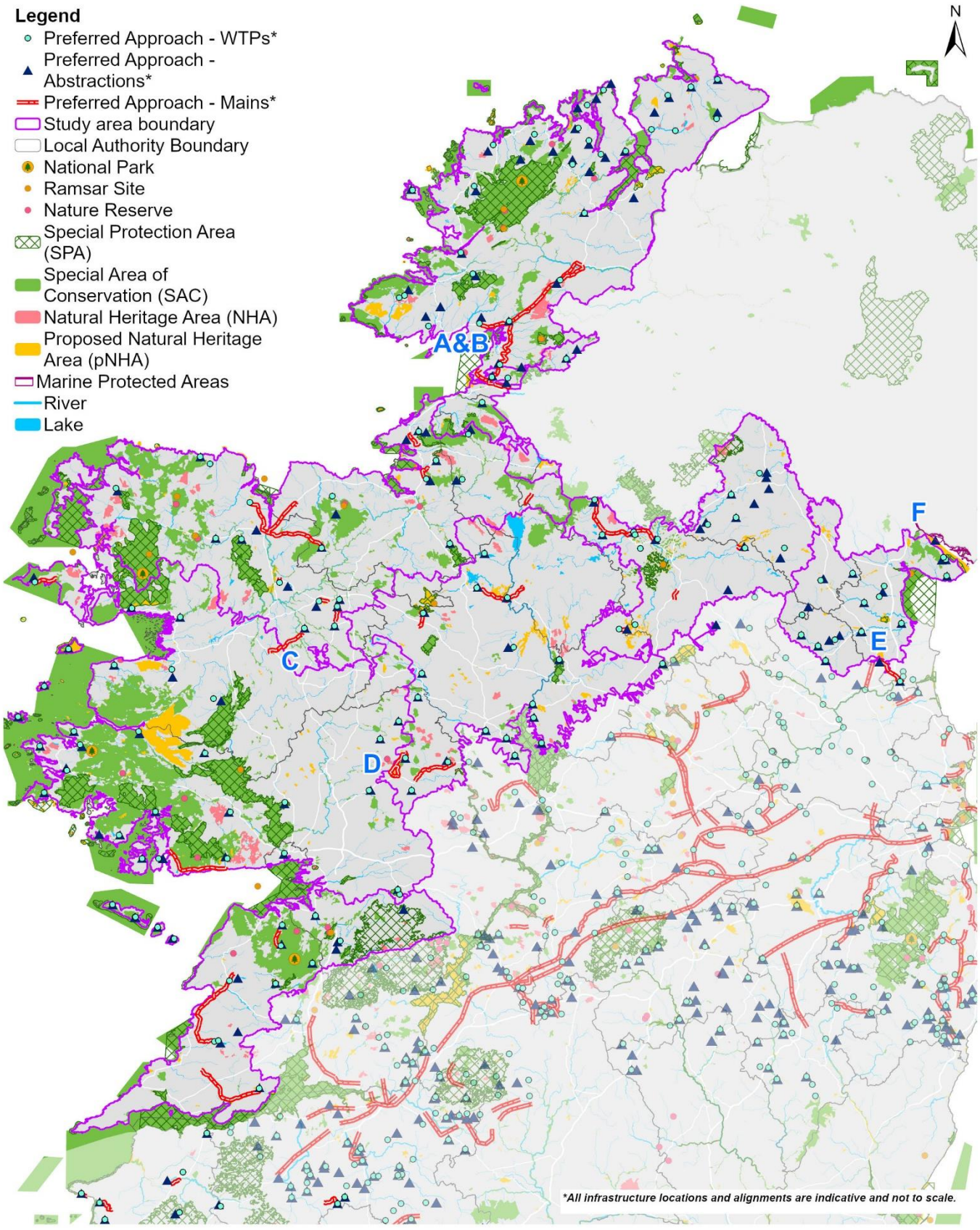


Figure NTS 9.2 Preferred approach with Cross Study Area Transfers and designations

The Corine land analysis[2], as shown on Figure NTS 9.1, shows that the largest land uses across the North West Region potentially affected by options within the Study Area Preferred Approaches are pastures, and peat bogs. All of these land uses and habitats could be temporarily disturbed, for example, through vegetation clearance within the 15m construction buffer zone around pipelines and site areas. For pipelines this will depend on route alignment and location within or alongside roads. Some land uses

will also be permanently lost within construction footprints for infrastructure such as Water Treatment Plants.

Sustainability analysis for groundwater and surface water abstraction has already taken account of combined effects from other Uisce Éireann abstractions within and across study area or region boundaries. Therefore, the components of Preferred Approaches most likely to lead to within-plan cumulative effects are the construction of pipelines and associated works, such as new Water Treatment Plants and pumping stations. The pipelines for smaller water transfers are likely to be road-based. The pipelines will vary in size but there are five small SA options that involve interconnections across study area boundaries (Cross Study Area Transfer) within the North West Region and one of which is within the Eastern and Midlands Region. There is also one WRZ option that maintains an existing import from Northern Ireland as a transboundary transfer (SAE-050 - see F in Figure NTS 9.2). The largest Cross Study Area Transfer is within the Easten and Midlands Region, from the New Shannon source (South Louth East Meath) in SA3 to the Drybridge Collon/Ardee WRZs in SAE; transferring water at approximately 3,800 Ml/d. The five cross study transfers and the Northern Ireland transboundary transfer are identified in Figure NTS 9.2 below:

- A - SAA to SAB (North West)
- B - SAA to SAB (North West)
- C - SAD to SAC (North West)
- D - SAD to SAF (North West)
- E - SA3 to SAE (Eastern & Midlands)
- F - Northern Ireland to SAE (Northern Ireland Import)

The 'within-plan' cumulative effects across the seven study areas are summarised in Table NTS 9.1 below.

Table NTS 9.1 'Within-Plan' Cumulative Effects Across the Study Areas

Study Area	Population, Economy, Tourism and Recreation, and Human Health	Water Environment	Biodiversity, Flora and Fauna	Material Assets	Landscape and visual amenity	Climate change	Cultural heritage	Geology and soils
SAA								
SAB								
SAC								
SAD								
SAE								
SAF								

[2] Since the land cover analysis was undertaken for the NWRP, OSI has published the National Land Cover Map. The analysis will be updated as part of the data review process as outlined in section 9 of the draft RWRP-SE. The National Land Cover data is identified as a source of baseline information in the SEA monitoring plan to be used for project development and assessments going forward.

Study Area	Population, Economy, Tourism and Recreation, and Human Health	Water Environment	Biodiversity, Flora and Fauna	Material Assets	Landscape and visual amenity	Climate change	Cultural heritage	Geology and soils
SAG								

Key	
Construction Phase	
Operation Phase	
Construction and Operation	

The potentially significant cumulative effects (positive and negative) identified in Table NTS 9.1, in relation to each SEA topic, are:

- Population, Economy, Tourism and Recreation, and Human Health (+/-);
- Water Environment (+/-);
- Biodiversity, Flora and Fauna (+/-);
- Climate Change (-);
- Landscape (-); and
- Cultural Heritage (-).

9.2 Cumulative Effects with Other Plans and Programmes

The strategic plans and programmes assessed for significant cumulative effects (positive and negative) are shown in Table NTS 9.2.

Table NTS 9.2 Cumulative Effects with Other Plans and Programmes

Plan/Project	Population, economy, tourism and recreation and human health	Water environment (quality and resources)	Water environment (flood risk)	Biodiversity	Material assets and waste	Landscape and visual amenity	Climate change (mitigation)	Climate change (adaptation)	Cultural heritage	Geology and soils
Ireland 2040: Our Plan, National Planning Framework (Government of Ireland, 2018)	+	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-
Regional Spatial and Economic Strategies	+	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-

Plan/Project	Population, economy, tourism and recreation and human health	Water environment (quality and resources)	Water environment (flood risk)	Biodiversity	Material assets and waste	Landscape and visual amenity	Climate change (mitigation)	Climate change (adaptation)	Cultural heritage	Geology and soils
River Basin Management Plan (RBMP) (2018-2021) and draft RBMP 2022-2027		+		+			+/-	+/-		
Climate Action Plan 2021		+		+			+	+/-		
Forestry Programme 2014-2020: IRELAND (as extended for 2021)		+		+			+	+/-		
National Marine Planning Framework (NMPF) Consultation	No direct interaction with the Regional Preferred Approach - potential for draft RWRP to support in the future with catchment management measures to improve water quality									
County and City Development Plans	+	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-
Local Area Plans	+	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-
Food Wise 2025	+	+/-		+/-			+/-			+/-
Draft Agri-Food Strategy 2030	+	+/-		+/-			+/-			+/-
EU Biodiversity Strategy for 2030	+	+		+						
National Biodiversity Action Plan	+	+		+		+	+	+		+
All Ireland Pollinator Plan 2021 – 2025	+	+		+		+	+			+
National Waste Action Plan for a Circular Economy 2020-2025					+	+				
Catchment Flood Risk Management (CFRAM) Programme (2011 onwards)	+		+							
Flood Risk Management Plans (2016)	+		+							
Offshore Renewable Energy Development Plan							+			
National Adaptation Framework (NAF)							+	+		

Plan/Project	Population, economy, tourism and recreation and human health	Water environment (quality and resources)	Water environment (flood risk)	Biodiversity	Material assets and waste	Landscape and visual amenity	Climate change (mitigation)	Climate change (adaptation)	Cultural heritage	Geology and soils
Tourism Development and Innovation 2016-2022	+	+/-		+/-		+			+	
Water Services Strategic Plan (WSSP)	+	+/-								
National Wastewater Sludge Management Plan (NWSMP) 2016-2021		+			+					+/-
Lead in Drinking Water Mitigation Plan (LDWMP)	+									
Northern Ireland Water (NI Water) Water Resource and Supply Resilience Plan and all other NI plans and strategies included in the PPP review list	Continuation of the existing import associated with SAE-050 is unlikely to result in changes in the interaction between the Regional Preferred Approach and the NI WRSRP									
Northern Ireland Marine Plan	The only option with potential for impact on the marine environment is the SAD-055 which is a small scale island desalination option. This is distant to NI waters and is not considered likely to conflict with the plan objectives.									
draft National Policy Statement on Geothermal Energy for a Circular Economy		+/-		+/-	+		+	+/-		+/-
National Implementation Plan for the Sustainable Development Goals 2022-2024	+	+		+			+			
National Development Plan 2021-2030	+	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-	+/-
Healthy Ireland Framework 2019-2025	+									
Ireland's CAP Strategic Plan 2023-2027		+		+			+	+/-		
The National Outdoor Recreation Strategy 2023-2027	+									
People, Place and Policy – Growing Tourism to 2025	+					+			+	

Plan/Project	Population, economy, tourism and recreation and human health	Water environment (quality and resources)	Water environment (flood risk)	Biodiversity	Material assets and waste	Landscape and visual amenity	Climate change (mitigation)	Climate change (adaptation)	Cultural heritage	Geology and soils
Creating Green Infrastructure for Ireland: Enhancing Natural Capital for Human Wellbeing	+			+		+	+	+		
National Landscape Strategy (NLS) for Ireland 2015-2025				+		+			+	
Our Rural Future Rural Development Policy 2021-2025	+					+			+	
National Energy and Climate Plan 2021-2030						+/-	+	+/-		

There are no additional mitigation measures identified from the assessment of interactions with other plans. The requirement to review and take account of relevant plans and policies in the implementation and future iterations of the RWRP-NW, is built into the monitoring and feedback step and embedded in the Environmental Action Plan provided in section 10.2 of the SEA Environmental Report.

9.3 SEA Summary for the Regional Preferred Approach

An overall assessment summary of the Preferred approach compared to the do minimum against SEA objectives is provided in Table NTS 9.3 below.

Table NTS 9.3 Regional Preferred Approach and Do Minimum Comparison

Population, economy, tourism and recreation and human health	Water environment (quality and resources)	Water environment (flood risk)	Biodiversity	Material assets	Landscape and visual amenity	Climate change (mitigation)	Climate change (adaptation)	Cultural heritage	Geology and soils
Do Minimum Approach									
-	-	0	-	-	0/-	0/-	-	0/-	0

- The 'Do Minimum' approach is the 'without plan' approach, meaning that this is the approach that would occur without the RWRP-NW. As a result, the 'Do Minimum' approach would only include reactive, unplanned interim measures to address likely failures in infrastructure.

- Ongoing reliability issues with the supplies and the situation is expected to further deteriorate due to climate change driven reductions in water resources and increased demand growth within the area.
- While there would not be major construction works there would likely to be increased pressure on existing abstractions. Including abstractions likely to be currently above sustainable levels and increasing issues with unreliable or inefficient network infrastructure.
- Currently 72 surface water bodies are identified by Uisce Éireann as not meeting sustainability guidelines during dry weather flows. These are likely to be subject to continued or increased abstraction pressure and other existing sources may also be subject to increased abstraction pressure in the future.

Population, economy, tourism and recreation and human health	Water environment (quality and resources)	Water environment (flood risk)	Biodiversity	Material assets	Landscape and visual amenity	Climate change (mitigation)	Climate change (adaptation)	Cultural heritage	Geology and soils
Regional Preferred Approach									
+	+/-	0/+	+/-	0/-	+/-	-	+	0/-	0/-

- Focus on three pillars of using less, losing less, and supplying smarter and a planned rather than a reactive approach and a resilient system with more reliable sources
- Implementation of the Regional Preferred Approach, which is the combination of Study Area Preferred Approaches for SAA-SAG, with the mitigation identified in the SEA Environmental Report Appendix D Environmental Action Plan, the Monitoring Plan and the Study Area Environmental Reviews SAs A-G.
- Construction impacts from pipelines and associated infrastructure. This will be mitigated by reinstatement of land uses and mitigation and enhancement to minimise long term landscape, land use and biodiversity effects.
- Network improvements adding flexibility and resilience.
- Decommissioning of inefficient infrastructure and abstractions including from 42 groundwater and surface water abstractions including twenty-eight surface water sources identified by Uisce Éireann as not meeting sustainability guidelines during dry weather flows. Reduced pressure on 44 maintained surface water abstractions identified by Uisce Éireann as not meeting sustainability guidelines during dry weather flows. Uisce Éireann has applied sustainability guidelines to all new surface water sources; however, further investigations will be undertaken to confirm sustainable yields for new and increased groundwater sources and these will be subject to assessments under the new abstraction legislation. Overall these will provide potential benefits for water dependent biodiversity including aquatic ecology and support for meeting Water Framework Directive objectives through more sustainable abstractions.
- Recognition that existing abstractions that will be upgraded and have been identified by Uisce Éireann as currently not meeting sustainability guidelines during dry weather flows will be supported by compensation flow releases.
- Carbon emissions associated with construction and moving and treating water.
- Improving Uisce Éireann's understanding of future risks, including climate change and efficient water use.

- Increasing routine monitoring and operational planning allowing Uisce Éireann to proactively manage and forecast resourcing and operational trends.
- Process put in place for monitoring implementation of the plan and reviewing and feeding back on a regular basis within the plan development cycle.

Key			
Likely to have a positive effect	+	Likely to have a mixed positive and negative effect	+/-
Likely to have a negative effect	-	Likely to have mixed neutral and negative effect	0/-
Effects are uncertain or not applicable	? or N/A	Likely to have mixed neutral and positive effect	0/+
Likely to have a neutral effect	0		

9.4 Appropriate Assessment Summary for the North West Region

There were -3 scores for the Preferred Approaches, three for SAA, SA-C, SAD and SAF. One for SAA (Cloghernagore Bog and Glenveagh National Park SAC, and Leannan River SAC), two for SA-C (Glenamoy Bog Complex SAC and Keel/Menaun Cliffs SAC), five for SAD (Lough Corrib SAC and SPA, Inishbofin SAC and SPA, Connemara Bog Complex SAC, and Twelve Bens/Garraun Complex SAC), and two for SAF (Lough Corrib SAC and Callow Bog SAC). All Likely Significant Effects (LSE) on European Sites can be addressed by mitigation measures as set out in full in the NIS. No Adverse Effects on Site Integrity (AESI) are identified at plan level.

9.4.1 Appropriate Assessment In-Combination Summary

In summary, potential in-combination impacts were identified at the North West Region's level for the following European sites:

- Donegal Bay SPA
- Galway Bay Complex SAC
- Inner Galway Bay SPA
- Lough Carra/Mask Complex SAC
- Lough Gill SAC
- Lough Mask SPA

However, potential in-combination effects (construction and/or operational) would only occur where options within each study area are progressed concurrently with one another or with projects, and in the absence of mitigation. With the implementation of mitigation as outlined in the Natura Impact Statement section 6.3 and Appendix E there will be no adverse effects on the integrity of the European sites, either alone or in-combination with other plans or projects as a result of progressing the Preferred Approach options associated with the RWRP-NW.

The conclusion of the Natura Impact Statement for the RWRP-NW is that, based on a plan-level assessment, and with implementation of appropriate mitigation for protecting European sites, there will be no adverse effects on the integrity of any European site(s), either alone or in-combination with other plans or projects as a result of progressing Preferred Approach options within the RWRP-NW.

9.5 Water Framework Directive Summary for the North West Region

Application of estimated allowable abstraction constraints on new options means that only options that are expected to meet sustainability requirements are considered. Individual options within the Regional Preferred Approach have been assessed and are expected to be sustainable, based on Plan Level desk-based assessment, in terms of avoiding deterioration of Water Framework Directive status or avoiding conflict with meeting Water Framework Directive objectives.

All surface water abstractions proposed within Preferred Approaches are within the expected sustainable abstraction limits of 10% or 5% of Q95 for 'good' and 'high' Water Framework Directive river waterbody status sources and 10% or 5% of Q50 for 'good' and 'high' Water Framework Directive lake waterbody sources respectively. Abstraction impacts on groundwater bodies have been assessed through a separate technical study which considered cumulative effects on Water Framework Directive groundwater quantitative status. Based on the available information this concluded that there is no indication of cumulative impact or impact on Water Framework Directive quantitative status of the groundwater bodies (Uisce Éireann, 2022).

However, cumulative effects also need to be considered, in terms of both sustainability for connected surface waterbodies and groundwater dependent habitats and protected areas. Further studies are identified in the Study Area Environmental Reviews for specific options where risks are identified.

9.6 Transboundary effects for the Regional Preferred Approach

The types of options and their location, proximity and pathways for environmental effects have been considered through the process in relation to possible environmental effects for the Northern Ireland environment including any shared groundwater and river catchments and the marine environment. None of the options identified in proximity to the border are considered likely to have transboundary effects due to construction or operation taking into account standard good practice mitigation measures. Option identified as SAE-050 involves the maintenance of an existing water transfer from Northern Ireland which is not considered to result in a change to the current baseline..

10 Mitigation and Monitoring Plans

The Mitigation and Monitoring Plans for the RWRP-NW are based on the plan outlined in section 8.3.8 of the Framework Plan and include three elements:

- Mitigation Measures including recommendations to incorporate into project development as options are taken forward through feasibility assessments, design, consenting and implementation;
- Environmental Action Plan (EAP) identifying actions to be taken to integrate environmental requirements into process and related areas so that mitigation recommendations implemented; and
- Monitoring Plan identifying the targets and indicators to be measured or recorded to determine progress to meeting SEA objectives.

The approach to monitoring takes account of the Environmental Protection Agency report '*The Tiering of Environmental Assessment – The influence of Strategic Environmental Assessment on Project-level Environmental Impact Assessment*' (Environmental Protection Agency, 2021).

The Monitoring Plan has therefore been provided in two parts; the first to address plan level monitoring and second to provide a framework for project level monitoring. The Environmental Action Plan will also include a task to review and update the monitoring indicators and targets to allow new conditions to be taken into account and to ensure the plan is sufficiently flexible to take account of environmental issues arising and any unforeseen adverse impacts. The plan level monitoring covers combined and cumulative effects. The indicators include both those aimed at positive as well as covering potential negative effects and sources, frequency and responsibilities are identified.

10.1 Environmental Action Plan

The Environmental Action Plan (EAP) set out in Table NTS 10.1 (green table) below, summarises the actions for mitigation and areas of further study identified in the SEA Environmental Report. The EAP provides a basis for tracking recommendations from the SEA during the NWRP implementation.

Table NTS 10.1 Environmental Action Plan

Ref no.	Recommended Action for Mitigation / Further Study	Target	Nouth West Region Progress summary: Completed: Y In progress: P Recommended: R
Identifying the Need – Quantity, Quality and Reliability			
Quantity – Supply Demand Balance			
Abstractions and Supply Side Yield Assessments			
EAP1	**EAP1.1** Link investigation on supply risks to environmental resilience and avoiding damage to vulnerable habitats and protected areas; especially European designated sites, and threats to Water Framework Directive water body objectives.	Environmental issues to be included in risk assessments for supply shortages or drinking water quality issues.	Y - completed for the RWRP-NW
Demand Side Data Improvements: Planning for Future Developments			
EAP2	**EAP2.1** Reviews of WRZ configuration can consider potential environmental benefits from rationalisation opportunities to improve operational efficiency for waste and energy use and also reduce need for developing new sources.	Optimised WRZs/study areas	Y– completed for the RWRP-NW
	EAP2.2 Feed information on potential for water efficiency improvements to provide savings into future options identification		
Linking SEA and Future Development of Schemes			
EAP3	**EAP3.1** Understanding causes of water quality issues for drinking water can support catchment management actions and wider environmental objectives. Link clean water element (RC3) on water quality compliance and ongoing programmes on improving drinking water quality to potential for long term solutions through to long term Catchment Management and Nature Based Solutions opportunities to reduce pollution in	Source risk assessments and drinking water safety plans linked to the NWRP process.	Y plan level assessment completed for the RWRP-NW R project level assessments for water sources

Ref no.	Recommended Action for Mitigation / Further Study	Target	Nouth West Region Progress summary: Completed: Y In progress: P Recommended: R
	groundwater and surface waters and water treatment issues.		
	EAP3.2 Link Drinking Water Safety Plans to scoping of study areas, prioritisation and options development process including consideration of catchment management opportunities.		R
	EAP3.3 Link ongoing projects with the supply demand assessments, scoping area studies and prioritisation for new investment. Consider as part of investment proposals for water treatment works – wider rationalisation opportunities with opportunities to reduce abstraction pressure on stressed sources and potential for improvements to residuals management (see also EAP 11.1)	Existing programmes and projects coordinated with the NWRP	Y completed for the RWRP-NW.
	EAP3.4 Value environmental and social benefits as well as costs in options development process (using environmental economics tools such as natural capital / ecosystems services and social value assessments) which can also value nature based solutions and catchment management benefits.	Cost Benefit Analysis and Multi-Criteria Analysis supported by environmental/social valuation as well as qualitative assessment	R
Delivering Solutions – Approach			
Climate Change			
EAP4	**EAP4.1** Take account of effects of climate change effects on protected areas and Water Framework Directive objectives as well as water supply.	Environmental resilience as part of the climate change risk assessment informing long-term solutions.	R
	EAP4.2 Results completed, and ongoing climate change studies should be used to inform future scoping of study areas/WRZs, and the types of solutions considered and prioritisation for investment.		R
	EAP4.3 Long term actions to improve water retention in upper catchments as well as		R

Ref no.	Recommended Action for Mitigation / Further Study	Target	Nouth West Region Progress summary: Completed: Y In progress: P Recommended: R
	catchment wide water quality initiatives could be considered as responses. Catchment management and nature based solution benefits linking improvements to water quality reducing treatment and opportunities for improving carbon sequestration in soils and through woodland planting (also linking to biodiversity objectives)		
	EAP4.4 Investigate opportunities to reduce carbon emissions in construction and operational phases reflecting importance of energy efficient and low carbon emission considerations in design and construction methods and considering opportunities for use of renewable energy sources. Ensure alignment with the Uisce Éireann Energy Efficiency Plan.	Identify how construction and operational carbon can be reduced across project development, construction and operation including potential for including renewable energy sources, such as solar panels, in project design	R
Lose less: Leakage Reduction			
EAP5	**EAP 5.1** Take forward studies and actions supporting meeting leakage targets and include consideration of relieving pressure on existing deficit areas and abstractions with sustainability issues and drought risks.	Develop information to support and improving leakage reduction	R
Use Less: Water Conservation			
EAP6	**EAP6.1** Link to raising awareness on environmental benefits of water conservation.	Improved awareness of benefits of conserving water (day to day and during extreme events)	R
	EAP6.2 Consider customer research on the water supply and demand management including water efficiency options development along with local community and stakeholder views.		R
	EAP6.3 As data is developed to support understanding on water conservation, develop water conservation/water efficiency options to be considered as part of the	Monitoring and feedback stage 8 of the options assessment methodology	R

Ref no.	Recommended Action for Mitigation / Further Study	Target	Nouth West Region Progress summary: Completed: Y In progress: P Recommended: R
	Options Assessment Methodology for future plan cycles.		
Supply Smarter: Capital Investment and Improved Operations			
See **EAP3, 4 and 5** in relation to linking ongoing programmes and future water resource planning and **EAP10, 11 and 12** on implementing options and approach assessment methodology.			
Drought Planning			
Information for Assessing Drought Risks			
EAP7	**EAP7.1** Identify the risks from potential drought actions for water sources designated for nature conservation value and supporting protected species - include lessons learned from the 2018 drought.	Drought - sources at risk identified	R
Environmental Mitigation of Drought Measures			
EAP8	**EAP8.1** Assess potential impacts of drought restrictions on customers, especially vulnerable groups, to identify both communication requirements and exemptions on restrictions relevant for each management area.	Drought management avoiding causing temporary or long-term impacts on protected habitats and species as well as minimising restrictions to customers	R
	EAP8.2 Develop drought communication plans and identify approaches to avoid impacts on vulnerable water users, for example, through exemptions – plan to provide customers with information early so that voluntary measures can be effective in avoiding the need for additional measures in most cases and taking forward the approaches from the 2018 summer drought and 2020 spring drought.		R
	EAP8.3 Prepare environmental assessments (including AA) for sensitive water sources at risk from drought management actions. These should be available in advance of measures being needed. They should include consultation on the assessments with environmental		R

Ref no.	Recommended Action for Mitigation / Further Study	Target	Nouth West Region Progress summary: Completed: Y In progress: P Recommended: R
	authorities and identify specific monitoring or mitigation measures.		
Residuals Approach			
EAP9	**EAP9.1** Include consideration of residuals management in the options development process involving WTPs or rationalisation opportunities	Residuals approach linked to options development process	Y
	EAP9.2 Apply the waste management hierarchy with any solid waste disposal limited to appropriate licensed sites.		R
Delivering Solutions: Options and Approach Assessment Methodology			
Integration of Environmental and Sustainability Considerations			
EAP10	**EAP10.1** Study area scoping to include analysis of environmental baseline issues, risks, constraints and opportunities to inform identification of initial options as providing context for the option development process.	Context for identifying and assessment options is provided	Y as part of RWRP-NW and SEA
	EAP10.2 Further development of the environmental and social impact valuation methodology as a tool for the approach appraisal process, based on ecosystems services assessment/natural capital assessment principles, can support cost benefit analysis and Multi-Criteria Assessment methodologies and provide quantitative information supporting SEA in the future.	Cost Benefit Analysis and Multi-Criteria Assessment supported by environmental valuation based on natural capital/ecosystems services approaches as well as qualitative assessment	R R
	EAP10.3 Comparison of combinations of options (or approach) should include assessment of cumulative effects for each study area (groups of WRZs) and be considered in determining the best value approach. Justification for the approach selected will need to be provided.	Best environmental solutions considered in selection of preferred solutions with mitigation built into design and costing. Opportunities for enhancement to contribute to objectives to be considered	Y as part of RWRP-NW and SEA R to be taken forward to project level

Ref no.	Recommended Action for Mitigation / Further Study	Target	Nouth West Region Progress summary: Completed: Y In progress: P Recommended: R
Transboundary Issues			
EAP11	**EAP11.1** Ensure potential for transboundary impacts are considered during options assessment and early consultation is undertaken to inform the assessment process.	Transboundary effects avoided	Y R
Delivering Sustainable Solutions			
EAP12	**EAP12.1** Link the options development information and SEA mitigation recommendations into the initial studies and designs for selected project level schemes so that assumptions and mitigation recommendations are taken forward. Develop a monitoring information template to capture key environmental information at key project development stages recording: • Project design/implementation stage and environmental assessment process applied and link to SEA and Natura Impact Statement recommendations • Data review and update at each key stage including reviewing current and draft policies and plans • Report on Monitoring Plan indicators • Identify potential for cumulative effects	Template developed and applied Preferred approach options taken to project stage subject to initial environmental review linking to information from the options development and assessment process and to good practice procedures and Monitoring Plan criteria.	P
	EAP12.2 Development of procedures to integrate good practice approaches for avoiding/mitigating environmental impacts and identifying enhancement opportunities in future scheme design and development.		P
	EAP12.3 Ensure environmental mitigation and study requirements are covered in option costing and risk aspects are taken into account in scheme development.		P

Ref no.	Recommended Action for Mitigation / Further Study	Target	Nouth West Region Progress summary: Completed: Y In progress: P Recommended: R
	EAP12.4 Review monitoring framework and update to ensure environmental mitigation and study requirements are covered in option costing and risk aspects are taken into account in scheme development.		R

10.2 Monitoring Plan

The Monitoring Plan is a requirement under the SEA regulations to provide a basis of identifying significant environmental effects during the implementation of the Plan. This is required to review the predicted impacts of the Regional Plan, and the adequacy of the mitigation measures recommended so that additional mitigation can be applied if required. Performance against the monitoring plan targets will also inform the next cycle Plan and SEA process.

The Monitoring Plan is provided in two parts:

- Regional Monitoring Plan – Part 1: North West plan level monitoring (Table NTS 10.1 – purple table); and
- Project Level Monitoring Framework – Part 2: Framework for project monitoring (Table NTS 10.2 – orange table).

The Monitoring Plan will take account of comments from the consultation process and has been designed to provide a basis for the identification and continuous review of the positive, negative and cumulative impacts of the RWRP-NW.

Table NTS 10.1 Regional Monitoring Plan: Indicators and Targets – North West Regional Plan Level Monitoring

SEA topics	SEA indicators	SEA targets
For monitoring Regional Plan. Monitoring results are to be fed back into the reporting for the Regional Plan and SEAs		
Reporting timescale: included in Regional Plan and SEA (developed during 2022-23)		
All topics and objectives	**Regional All Topics 1** Application of the options and approach assessment process, as set out in the Framework Plan, to integrate environmental, social and sustainability SEA objectives alongside other criteria in the preparation in the Regional Plans **Regional All Topics 2** Application of methodology for SEA and Appropriate Assessment in the comparison and selection of Preferred Approaches for the preparation in the Regional Plans **Regional All Topics 3** Environmental and social valuation methodology developed further as a tool using natural capital/ecosystems services assessment **Regional All Topics 4** Transparent documentation of the appraisal and selection process	• Target 1 Options and plan approach to find sustainable solutions that contribute to environmental objectives
All topics and objectives	**Regional All Topics 5** Iterative approach to the identification of appropriate options meeting objectives, and mitigation measures incorporated into project costs or risks, as part of the development of options for the Regional Plans and as a basis for future project costing. **Regional All Topics 6** Identification of process for undertaking the relevant options studies and feeding back where potential significant environmental effects are identified including engagement with relevant stakeholders.	• Target 2 Process implemented for iterative options assessment through identification, option design development stages and identification of mitigation measures and input to project costing • Target 3 Option development for Preferred Approach options built on the SEA and Appropriate Assessment work and incorporating feedback to the next Framework Plan and adequate comparison with alternatives at key points

SEA topics	SEA indicators	SEA targets
For monitoring Regional Plan. Monitoring results are to be fed back into the reporting for the Regional Plan and SEAs		
Reporting timescale: to be phased for RWRP-NW implementation 2023 onwards		
All topics and objectives	**Regional All Topics 7** Environmental assessment, including Appropriate Assessment, for designated international and national sites potentially affected by drought measures **Regional All Topics 8** Communication plan for drought/freeze-thaw period actions	• Target 4 Source-specific environmental assessment and mitigation and monitoring measures agreed, avoiding long-term damage on designated sites and associated species from drought measures
Reporting timescale: annual reporting for RWRP-NW from 2023 onwards		
All topics and objectives	**Regional All Topics 9** 1. Monitoring plan data collection implemented (see below for each topic) set up to support baseline information for the next Regional Plan, project level feedback, identification of cumulative effects, and providing the basis for monitoring future implementation 2. Review of the monitoring plan and update where needed to capture issues or unforeseen effects.	• Target 5 Monitoring plan data compiled for feeding into future Framework Plans and the Stage 8 Monitoring and Feedback process.
Population, economy, tourism and recreation, and human health	**Regional Population and Health** 1. Level of Service achieved 2. Frequency and duration of droughts needing management actions 3. Number of days/hours when water supply to people is disrupted due to drought, freeze-thaw or other service/infrastructure issues 4. Awareness raising programmes on water conservation 5. Reduced water supply restrictions due to water quality risks	• Target 6 Maintained or improved access to reliable and safe drinking water meeting forecast demand • Target 7 Reduced number of drought actions affecting supply • Target 8 Raised public awareness of actions to take for water conservation with reduced household /non domestic per customer demand
	Regional Recreation and Tourism Level of service accommodating seasonal tourism demand	See Target 6
Water environment	**Regional Water Environment** 1. Number of investigations and area covered by catchment management schemes and number of nature based solutions put in place	• Target 9 Improved environmental resilience and water quality within water resource use catchments • Target 10 Contribution to restoration to “good” status of

SEA topics	SEA indicators	SEA targets
For monitoring Regional Plan. Monitoring results are to be fed back into the reporting for the Regional Plan and SEAs		
	2. Additional water quality and biological monitoring/data collection in addition to Water Framework Directive monitoring data where needed 3. Number of demand management initiatives supporting water savings 4. Compliance with Water Services Strategic Plan Strategy Objective to manage water supplies in an efficient and economic manner (WS3). Key indicator – Leakage expressed as a percentage of treated water put into the distribution system 5. Number of waterbody sources where Water Framework Directive good status is not reached due to abstraction pressure 6. Number of waterbody sources benefiting from reduced abstraction or cessation in abstraction	waters currently at "moderate", "poor" or "bad" status (Water Framework Directive objective) • Target 11 Achieve leakage targets identified for the South East
	Regional Flooding 1. Number of outages due to flood events or power or outages	• Target 12 No loss of supply due to flood events
Biodiversity, flora and fauna	**Regional Biodiversity** 1. Identification of existing abstractions or drinking water treatment residuals with risks to international or national designations 2. Aquatic ecology - number of existing abstractions identified by Uisce Éireann as potentially unsustainable in dry weather conditions where abstractions are reduced or abandoned 3. Number of waterbodies with improvements benefiting raw water quality/aquatic ecology due reduced or cessation of abstractions, catchment management, nature based solutions, river enhancement, migration barrier removal 4. Number of waterbodies sources where Water Framework Directive good status is not reached due to abstraction pressure 5. Regional information on net loss/gain of habitats collated from proposed and undertaken projects	• Target 13 No adverse effects on integrity of European, national or regional level designations and, where feasible, seek to contribute to achieving favourable conservation status • Target 14 Improvement to aquatic biodiversity of existing waterbody sources • Target 15 region wide no net loss of high value habitats and improved habitat connectivity (OSI National Land Cover data can be used as a basis for determining no net loss)
Material assets	**Regional Material Assets**	• Target 16 No drinking water treatment residuals sent to landfill

SEA topics	SEA indicators	SEA targets
For monitoring Regional Plan. Monitoring results are to be fed back into the reporting for the Regional Plan and SEAs		
	1. Tonnes of residuals reused or recycled across region per year 2. Tonnes of waste disposed of to landfill for the region per year	and no reduced abstraction to other users due to new schemes
Landscape and visual amenity	**Regional Landscape and Visual** 1. Total working area of pipelines through protected landscapes, outside protected areas, and urban areas 2. Development of protected landscape strategies to guide work in important and valued landscapes	• Target 17 Improvement or no net change in landscape quality
Climate change	**Regional Climate Change Mitigation** 1. Percentage of energy supply from renewable sources and energy efficient improvement for the region. 2. Carbon footprint (total tonnes) per year, predicted over plan period, lifetime of schemes of water resource options (tonnesCO_2equiv) 3. Operational Carbon Intensity kgsCO_2equic/ML overall achieved for the region each year 4. Total carbon value from any carbon offsetting schemes linked to the Plan	Decarbonisation through the following: • Target 18 Increased contribution of renewable/low carbon energy sources for existing and new schemes including project-based sources. • Target 19 Minimised the annual carbon emissions from operation and reduced carbon intensity of water supply • Target 20 Supported carbon offsetting schemes, including upper catchment schemes linked to biodiversity and water and population wellbeing (recreational) objectives
	Regional Climate Change Adaptation 1. Frequency of drought (including freeze thaw) orders requiring change to normal abstractions/compensation releases 2. Number of outages due to weather events and power loss	• Target 21 Improved resilience of environment to climate change
Cultural heritage	See project level monitoring	N/A
Geology and soils	See project level monitoring	N/A

The Monitoring Plan - Part 2 Framework for the project monitoring is set out below in Table NTS 10.2. This is intended to provide a framework for project level monitoring which can be considered as part of the plan feedback and review process as the individual projects are developed and implemented.

Table NTS 10.2 Project Level Monitoring Framework: Indicators and Targets - Project Level Framework

SEA topics	SEA Project level indicators	SEA Project targets
For monitoring individual projects. Monitoring results on individual projects also to be fed back to reporting for the Regional Plan and SEAs. Note that not all indicators will be relevant for all types of projects		
Reporting timescale: across each project develop over plan implementation period		
All topics and objectives	**Project All Topics 1** Environmental screening applied for all projects to check appropriate level of study and assessment to address risks of environmental impacts but also opportunities for enhancements or reduction of and carbon emissions in construction and operation and application of waste hierarchy, including taking account of recommendations from the SEA and Natura Impact Statement. Include engagement with stakeholders. Assessments will take account of relevant and available data sources including those recommended by the Environmental Protection Agency, National Parks and Wildlife Service, and Department of Energy and Climate Change. Include consultation with DAERA and other relevant Northern Ireland organisations where there is potential for transboundary effects.	• Project Target 1 Project development to find sustainable solutions that contribute to environmental objectives
All topics and objectives	**Project All Topics 2** Application of project level monitoring and feedback to identify potential significant environmental effects are identified at each stage of project development and implementation process and post project evaluation or audit.	• Project Target 2 Process implemented for project level development feeding back information for project and regional level review
Population, economy, tourism and recreation, and human health	**Project Population and Health** a) Number of complaints received relating to construction works b) Duration of works with traffic control /disruption c) Noise levels at receptors within recommended limits during construction and operation and mitigation provided where assessment indicated levels are exceeded d) Dust management plan applied for construction	• Project Target 3 Minimise extent and period of disruption to traffic related to construction • Project Target 4 Minimise access restrictions and noise disturbance to people from construction and operation of schemes
	Project Recreation a) Number of footpath/access closures/diversions	• Project Target 5 No net loss of important recreational amenity,

SEA topics	SEA Project level indicators	SEA Project targets
	b) Length of public access paths created compared to loss c) Area of any amenity improvement provided, or amenity area lost (ha)	improved access and support for new recreational amenity
Water environment	**Project Water Environment** a) Additional water quality and biological monitoring/data collection in to supplement Water Framework Directive monitoring data where needed b) Sustainability of abstraction for surface or ground water c) Inclusion of supporting measures to safeguard or improve raw water quality where appropriate d) Design measures to contribute to remove or contribute to removing barriers to fish migration where appropriate and within Uisce Éireann responsibility. e) Improvement to river morphology/aquatic ecology/water quality f) Consult INFOMAR and other Geological Survey Ireland Marine and Coastal Unit datasets to identify constraints g) Consult Waterways Ireland as the navigation authority regarding canals and waterways to identify constraints.	• Project Target 6 Avoids "No deterioration" in status of waters (WFD objective) • Project Target 7 Contributes to restoration to "good" status of waters currently at "moderate", "poor" or "bad" status and WFD objectives
	Project Flooding a) Area of flood plain/flood storage loss and compensation provided b) Flood risk vulnerability to water supply change due to project c) Any significant increase in flood risk to property or assets due to project d) Consult the GW Climate project (follow on from GW Flood project) data in relation to Flood Risk Assessment e) Consult the Geological Survey Ireland's Groundwater Protection Schemes to identify constraints f) Consult Geological Survey Ireland's Coastal Vulnerability Index study to identify constraints related to the adverse impacts of sea-level rise on the Irish coast	• Project Target 8 No net flood plain area lost as a result of the plan, and where possible increase functioning flood plain • Project Target 9 Reduced flood risk or vulnerability to supply

SEA topics	SEA Project level indicators	SEA Project targets
Biodiversity, flora and fauna	**Project Biodiversity** a) For designated nature conservation sites potentially affected by water resource options: b) Area of each designated site/type affected and the likely impact c) Area of site with a predicted or recorded change in condition (positive or negative) d) Plan for/measurement of enhancement - area/length of habitat loss or affected vs restored - (for example use of biodiversity metrics to compare before and after habitats area and condition) e) Improvement in habitat connectivity or loss of connectivity f) Improvement to aquatic habitats and fish migration where relevant g) Removal of residuals discharge to waterbodies h) Invasive species risk assessment i) Identification of potential for applying nature-based solutions or catchment management including opportunities for biodiversity enhancement	• Project Target 10 No adverse effects on integrity of European, national or regional level designations and, where feasible, seek to contribute to achieving favourable conservation status • Project Target 11 No net loss of valued habitats or habitat connectivity as a result of the works and, where possible, demonstrate habitat enhancement/creation • Project Target 12 reduced invasive species risk • Project Target 13 Implementation of nature-based solutions or enhancement linked to catchment management
Material assets	**Project Material Assets** a) Area of permanent loss of greenfield land, including agricultural, forestry or other land uses or area returned to greenfield, habitat or community use. b) Materials and waste management plans used on all new schemes and including decommissioning of infrastructure c) Sustainability assessment including consideration of non Uisce Éireann abstractions d) Residuals management for water treatment plant upgrades and new plant designed in accordance with Uisce Éireann's Residuals Management Strategy	• Project Target 14 Minimise permanent loss of greenfield land, including agricultural, forestry or other land uses • Project Target 15 Minimise material consumption and waste during construction and operation of schemes • Project Target 16 Increase investment in existing and new water treatment and wastewater management infrastructure • Project Target 17 No drinking water treatment residuals sent to landfill and no reduced abstraction to other users due to new schemes
Landscape and visual amenity	**Project Landscape and Visual** a) Total working area of pipelines through protected landscapes, outside protected areas, and urban areas b) Development of protected landscape strategies to	• Project Target 18 Improvement or no net change in landscape quality through landscape

SEA topics	SEA Project level indicators	SEA Project targets
	guide work in important and valued landscapes c) Land use/landscape features re-established for projects over an appropriate period – areas/km successfully restored to meet requirements	design and mitigation and enhancement
Climate change	**Project Climate Change Mitigation** a) Carbon footprint (total tonnes) of construction and lifetime carbon tonnes including operational carbon calculated for the project b) Carbon intensity calculated of the project ($kgsCO_2equic/ML$) based on lifetime carbon c) Inclusion of renewable energy sources as part of the project d) Decarbonisation plan to inform design, construction and operation e) Carbon offsetting opportunities through carbon sequestration such as woodland planting or peat bog restoration.	Decarbonisation through the following: • Project Target 19 Benchmarked reduced carbon emissions from construction • Project Target 20 Increased contribution of renewable/low carbon energy sources • Project Target 21 Minimise the annual carbon emissions from operation and Improve energy efficiency of water services • Project Target 22 Scheme related carbon offsetting- such as upper catchment management initiative/ collaboration linked to biodiversity and water and population wellbeing (recreational) objectives
	Project Climate Change Adaptation a) Flood, freeze thaw and drought risk vulnerability assessment including power outages to inform scheme design.	• Project Target 23 Improved project resilience to climate change
Cultural heritage	**Project Cultural Heritage** a) Number of designated sites or other important archaeological or architectural heritage sites and/or their settings adversely affected by water resource options including through hydrological change from abstraction b) Provision of access to/or recording of assets and communication/interpretation of interest features where appropriate	• Project Target 24 No unauthorised physical damage or alteration of the context of cultural heritage features due to Uisce Éireann activities • Project Target 25 All schemes developed applying best practice approaches for consultation, desk study and investigation and mitigation for cultural heritage and archaeological interest
Geology and soils	**Project Geology and Soils** a) Area of geological site affected by water resource options	• Project Target 26 No loss of statutory and non-statutory geological sites of interest

SEA topics	SEA Project level indicators	SEA Project targets
	b) Total area of soil removed or reused on schemes c) Area of contaminated land restored, or soils removed d) Area within catchment management initiative where soil is to be improved for example by reducing soil loss/erosion, reducing artificial fertiliser use, increasing soil carbon and increasing native woodland planting e) Consult the National Geodatabase, the Geological Survey Ireland's Groundwater and Geothermal Unit, the National Landslide Database and Landslide Susceptibility Map, and the Historic Mine Site project datasets to identify constraints	• Project Target 27 Minimal disturbance or loss of high-quality land as a result of the Framework Work and minimal net loss of soil resources • Project Target 28 Catchment areas where raw water quality issues have been improved though soil and land management changes