Winter 2023

Regional Water Resources Plan South East

Natura Impact Statement

Tionscadal Éireann
Project Ireland
2040

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 NIS reflects this transition from Irish Water to Uisce Éireann.

Baseline data included in the RWRP-SE 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 will be detailed in the relevant sections of the RWRP-SE. 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.

Glossary

Term	Definition
Adverse Effects on Site Integrity (AESI)	Activities usually resulting from a plan or project that could result in effects on qualifying interest (Annex I habitats or Annex II species) of a European site which could have implications for the conservation objectives of the site leading to AESI.
Annex I Habitat	A habitat listed in Annex I of the Habitats Directive.
Annex II Species	A species listed in Annex II of the Habitats Directive.
Appropriate Assessment (AA)	An assessment carried out under Article 6(3) of the Habitats Directive of the implications of a plan or project, either individually or in-combination with other plans and projects, on a European site in view of the site's conservation objectives.
Best AA	The approach that following a desktop assessment has the Least Impact on European Sites (without consideration of mitigation measures)
BA	Barrier Assessment
Birds Directive	Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds.
CIRIA	Construction Industry Research and Information Association
Competent authority	Public body provided for in the relevant legislation that makes statutory determinations (for example, in relation to AA).
Conservation Objectives (COs)	In the context of this report, conservation objectives are discussed in relation to European sites. Some European sites have site-specific conservation objectives (SSCOs); other European sites have generic conservation objectives. The National Parks and Wildlife Service are in the process of producing detailed conservation objectives for all European sites and their Qualifying Interests.
CRU	Commission for Regulation of Utilities
Deployable Output (DO)	Deployable Output is the output of a commissioned water supply source, group of sources or bulk supply under a given set of flow sequences as constrained by abstraction licences, environmental constraints, water treatment capacities and asset capacities
DHLGH	Department of Housing, Local Government and Heritage
DMA	District Metered Area
DWSP	Drinking Water Safety Plan
DYCP	Dry Year Critical Period
EBSD	Economics of Balancing Supply and Demand
ECJ	European Court of Justice
Environmental Impact Assessment (EIA)	EIA is the process where potential environmental effects of a proposed project are examined.
EPA	Environmental Protection Agency
European Commission	The Commission of the European Union.

Term	Definition
EU	European Union
European site	Any Special Area of Conservation (SAC) or Special Protection Area (SPA), also referred to as Natura 2000 sites.
Framework Plan	The component of the NWRP that sets out a description of the methodology that Uisce Éireann proposes to use for water resources planning, and an assessment of Need across Uisce Éireann's asset base in terms of quality, quantity, reliability and sustainability.
GDA	Greater Dublin Area
Groundwater (GW)	Groundwater is the water held underground in the soil or in pores and crevices in rock.
Groundwater Body (GWB)	A distinct volume of groundwater within an aquifer or system of aquifers, which is hydraulically isolated from nearby groundwater bodies.
GWDTH	Groundwater Dependent Terrestrial Habitat
Habitats Directive	Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.
IFI	Inland Fisheries Ireland
INNS	Invasive Non-Native Species
IROPI	Imperative Reasons of Over-Riding Public Interest
LDWMP	Lead in Drinking Water Mitigation Plan
LoS	Level of Service
Likely Significant Effects (LSEs)	Term adapted from Article 6(3) of the Habitats Directive ("likely to have a significant effect"), describing the type of effects which, if identified as potentially arising as a result of a project or plan, trigger an AA.
LWB	Lake Waterbody
MCA	Multi-Criteria Analysis
MSA	Midlands Strategic Study Area
National Parks and Wildlife Service (NPWS)	The National Parks and Wildlife Service is fully integrated in the Heritage Division of the Department of Culture, Heritage and the Gaeltacht and has responsibility for the protection and conservation of Ireland's natural heritage and biodiversity at national government level.
National Water Resources Plan (NWRP)	Uisce Éireann's plan to identify how it will provide a safe, sustainable, secure and reliable water supply to its customers for now and into the future whilst safeguarding the environment. It will set out how Uisce Éireann will balance the supply and demand for drinking water over the short, medium and long term. It is a 25-year strategy to ensure we have a safe, sustainable, secure and reliable drinking water supply for everyone.
NPF	National Planning Framework
NPO	National Planning Objective

Term	Definition
NWSMP	National Wastewater Sludge Management Plan
Natura Impact Statement (NIS)	Term for the statutory report produced to inform the AA of a plan by the competent authority.
NPV	Net Present Value
Precautionary Principle	Implicit in the Habitats Directive is the application of the precautionary principle, which requires that the conservation objectives of Natura 2000 should prevail where there is uncertainty. This requires objectively demonstrating, with supporting evidence, that there will be no adverse effects on the integrity of the Natura 2000 site. Where this is not the case, adverse effects must be assumed.
Priority habitat	Natural habitat types on Annex I of the Habitats Directive, and indicated by an asterisk (*), which are in danger of disappearance, and for which the European Community has particular responsibility in view of the proportion of their natural range which falls within the European territory of the Member States.
Priority species	Species for the conservation of which the European Community has particular responsibility in view of the proportion of their natural range which falls within the European territory of the Member States, these priority species are indicated by an asterisk (*) in Annex II of the Habitats Directive. At present, Ireland does not have any priority species.
PCT	Project Costing Template
Qualifying Interest (QI)	One of the features (habitat or species) that are the reasons for designation of a Special Area of Conservation, identified in the Conservation Objectives for that site.
Red, Amber or Green (RAG)	A colour code using the traffic light scoring system where a red rating will assume unviability and therefore will be eliminated on this basis and assessed no further; an amber rating would not be ruled out and will be carried forward for further evaluation and a green rating will assume that there are no negative impacts and will therefore be carried forward.
RBMP	River Basin Management Plan
RWRP	Regional Water Resources Plan
Screening for AA	The screening of a plan or project to establish if an AA of the plan or project is required. An AA must be carried out unless the screening assessment can establish that there is no potential for LSEs on a European site.
Special Area of Conservation (SAC)	SACs are sites designated under the Habitats Directive. This requires the conservation of important, rare or threatened habitats and species (not birds, which are protected by Special Protection Areas) across Europe.
Special Conservation Interest (SCI)	The term used to refer specifically to bird species for which Special Protection Areas have been designated. These are also identified in the Conservation Objectives for the site.
Special Protection Area (SPA)	SPAs are sites designated under the Birds Directive to conserve the habitats of certain migratory or rare birds.
Strategic Environmental Assessment (SEA)	A SEA is an environmental assessment of plans and programmes to ensure a high-level consideration of environmental issues in the plan preparation and adoption, and is a requirement provided for under the SEA Directive (2001/42/EC). The SEA and AA are undertaken in tandem with the drafting of a plan.

Term	Definition
Study Area (SA)	The Regional Groups are subdivided into Study Areas which are clusters of Water Resource Zones.
Surface Water (SW)	Surface water is any body of water above ground, including streams, rivers, lakes, wetlands and reservoirs.
Supply Demand Balance (SDB)	The SDB is the deficit or surplus between the supply and demand both now and over the 25-year horizon.
UKTAG	UK Technical Advisory Group
UKWIR	UK Water Industry Research
WAB	Water Abstraction
WAFU	Water Available for Use
Water Framework Directive (WFD)	Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy (the WFD) is an EU Directive which commits European Union member states to achieve “Good” qualitative and quantitative status of all water bodies by taking a holistic approach to managing all waters. It applies to rivers, lakes, groundwater, estuaries and coastal waters.
WRMP	Water Resources Management Plan
Water Resource Zone (WRZs)	Water Resource Zones are the units for which the SDB calculations are carried out. WRZs are made up of one or more Water Supply Zones
WHO	World Health Organisation
WSPS	Water Services Policy Statement
WSSP	Water Services Strategic Plan
Water Supply Zones (WSZs)	A Water Supply Zone typically includes one or more abstractions (from a river, lake, Impounding Reservoir or groundwater), a Water Treatment Plant, storage in reservoirs and the distribution pipe network to deliver the water to each household or business.
Water Treatment Plants (WTPs)	A facility that processes and converts wastewater into an effluent (outflowing of water to a receiving body of water) that can be returned to the water cycle with minimal impact on the environment or directly reused.
Zone of Influence (ZoI)	Term used widely in environmental assessments. The ZoI defines the spatial area over which there is potential for LSEs, taking account of the sensitivity and mobility of different QI/Special Conservation Interest, on species or habitats from a project or plan.

1 Introduction and Background

1.1 Introduction

Uisce Éireann assumed statutory responsibility for the provision of public water services and management of water and wastewater investment for Ireland on the 1st January 2014. Its role is to ensure that all its customers and communities receive a safe and secure supply of drinking water and have their wastewater collected, appropriately treated and returned to the environment. Uisce Éireann supports Ireland's social and economic growth in a sustainable manner through appropriate investment in water services and strives to protect the environment in all our activities.

Uisce Éireann is regulated by:

- The economic regulator, the Commission for Regulation of Utilities (CRU), which is charged with protecting the interests of the customer. The CRU also approves funding to enable Uisce Éireann to deliver the required services to specified standards in an efficient manner.
- The environmental regulator, the Environmental Protection Agency (EPA), which sets standards and enforces compliance with European Union (EU) and national regulations for drinking water supply and wastewater discharge to water bodies. The EPA liaises with the Health Service Executive in matters of public health.

1.2 Regional Water Resources Plans

The Regional Water Resources Plan – South East (RWRP-SE) is one of four regional plans that, along with the NWRP Framework Plan published in Spring 2021, comprise Ireland's first NWRP. Uisce Éireann's NWRP will be the first such plan for the entire public water supply in Ireland. It will allow Uisce Éireann to integrate government policy, legislation and external factors, including climate change, that have the potential to impact our demand for water and water supplies, into the planning and operation of our existing and future supply asset base and the way we all use water. The objectives of the NWRP are to:

- Enable Uisce Éireann to address needs across water supplies in the most effective way over time, through the 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;
- 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; and
- Deliver a plan to ensure that all of our customers have access to safe, secure, reliable and sustainable water supplies, wherever they live.

The NWRP also aims to support balanced regional development, as outlined in the National Planning Framework (NPF) and the supporting Regional Spatial and Economic Strategies (RSES), by assessing water supply needs across our growing communities.

The four regional plans will include:

- Regional Water Resources Plan-North West (RWRP-NW) (Group Area 1)
- Regional Water Resources Plan-South West (RWRP-SW) (Group Area 2)
- Regional Water Resources Plan-South East (RWRP-SE) (Group Area 3)
- Regional Water Resources Plan-Eastern and Midlands (RWRP-EM) (Group Area 4)

Each RWRP will identify deficiencies and need across the water supplies within the region and develop regional plan-level solutions to address these issues. The combined regional solutions will be prioritised collectively at a national level through Uisce Éireann's planning and investment cycles and form the basis of the NWRP.

The groupings (as seen in Figure 1.1) reflect Uisce Éireann's operational regions and water supply boundaries, with modifications to account for river catchments, as delineated by the EPA in the River Basin Management Plan (RBMP).

Figure 1.1 – Regional Groupings for Phase 2

The development of four RWRPs is a mechanism for efficient delivery of the NWRP. The outputs of the four RWRPs will be combined for prioritisation and progression through the future cycles of capital investment planning. The Strategic Environmental Assessment (SEA) Environmental Reports and Natura Impact Statement (NIS) for each subsequent Regional Plan will consider the cumulative impacts and in-combination effects with the preceding Regional Plan/Plans and adjustments can be made to address any cumulative impacts identified.

1.3 Structure of the Plan

Phase 1 of the NWRP (the Framework Plan) set out a new Option Assessment Methodology that Uisce Éireann will use to develop a national programme of preferred projects for delivery over the next 25 years to meet the identified need across the public water supply.

The Options Assessment Methodology, as presented in the Framework Plan, will ensure that Uisce Éireann develops appropriate and sustainable interventions, that align with Uisce Éireann's overarching three pillar approach (see Figure 1.2) to:

- **Lose Less -** reducing water lost through leakage and improving the efficiency of Uisce Éireann's distribution networks.
- **Use Less -** reducing water use through efficiency measures.
- **Supply Smarter -** improving the quality, resilience and security of Uisce Éireann's supply through infrastructure improvements, operational improvements and by developing new sustainable sources of water.

Together these pillars will enable Uisce Éireann to optimise its capital and operational interventions to achieve the best outcomes and react to emerging issues. Further information on the "Three Pillars" is detailed in Chapter 7 of the Framework Plan.

Figure 1.2 – Three Pillar Approach

The Options Assessment Methodology is outlined in Chapter 9 of the Framework Plan. The methodology is based around an option development process which is being rolled out as part of the Regional Plans. 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*". The key stages of the Framework Plan Options Assessment Methodology process is illustrated in Figure 1.3 and summarised below.

1. Identify need - based on SDB and/or Drinking Water Safety Plan Barrier Assessment.
2. Scoping of the Study Area (Water Resource Zones (WRZs)) – understanding the Study Area and the existing conditions of assets, supply and demand issues as well as environmental constraints and opportunities.
3. Unconstrained Options – 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 scoring assessment update.
7. Approach development – 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 (MCA) to determine the Preferred Approach. Approaches tested will include:
    - Least Cost
    - Best Appropriate Assessment (Best AA)
    - Quickest Delivery
    - Best Environmental
    - Most Resilient
    - 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.

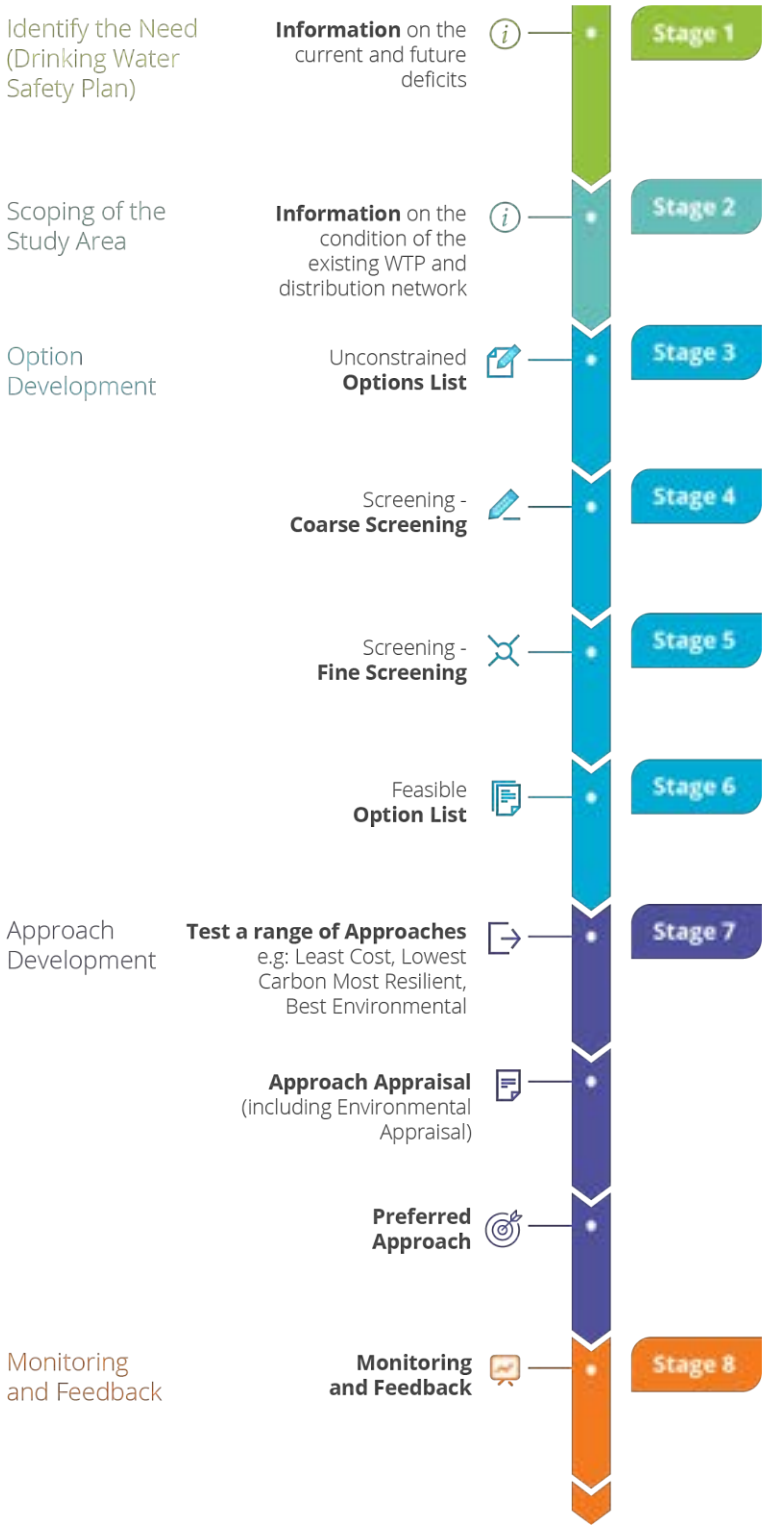

Figure 1.3 – Option Assessment Methodology Process

Table 1.1 - National Water Resources Plan Phases

NWRP Phases	NWRP Reports	Content
Phase 1: NWRP – Framework Plan	NWRP – draft Framework Plan	Need identification including the SDB Calculations NWRP Objectives Generic Option Types Options Assessment Methodology
	Case Study – Study Area	Test of the Options Assessment Methodology against Study Area 5 provided as an example with the draft Framework Plan to demonstrate the methodology. The outcomes are not part of draft Framework Plan consultation.
	NWRP – final Framework Plan	Finalise and adopt NWRP - Framework Plan
Phase 2: RWRPs (Regional Plans)	Draft RWRP (draft Regional Plans)	Application of Options Assessment Methodology and Identification of the Preferred Approach for the following regions: • RWRP-NW (Group Area 1) • RWRP-SW (Group Area 2) • RWRP-SE (Group Area 3) • RWRP-EM (Group Area 4)
	Final RWRPs (final Regional Plans)	Regional Plans for each of the Group Areas (1 to 4) will be published, finalised and adopted in succession.

The screening for Appropriate Assessment (AA) of the Framework Plan identified that all management option types arising from the NWRP had the potential to give rise to Likely Significant Effects (LSEs) on European sites. Therefore, all Regional Group Areas (1, 2, 3 and 4) and the management option types selected for same, are all subject to Appropriate Assessment with the LSEs identified for the Framework Plan further assessed and their implications for European site integrity identified in the context of potential impact pathways, their implications for the conservation objectives of European site(s), and the identification of any mitigation that might be required to protect site integrity. Given the scale of the NWRP the accompanying NISs to support AA reporting will be presented as part of Phase 1 and Phase 2 (see Table 1.1 above) of the NWRP; Phase 1 of the process having been completed. For Phase 2 of the NWRP the Regional Plans for each of the Group Areas (1 to 4) will be published in succession. The draft RWRP-EM was the first of the RWRPs to be published, which was subsequently adopted in September 2022. This was followed by the publication of the draft RWRP-SW in Summer 2022, and its adoption in Spring 2023. The draft RWRP-NW was published in Autumn 2022 and adopted in Summer 2023, and finally, the draft RWRP-SE, was the last RWRP to be published in Summer 2023, and adopted in Winter 2023. Consultation for each of the published draft Regional Plans, and their accompanying NIS, was undertaken sequentially in 2021, 2022 and 2023. This position was confirmed in the Regional Plan-specific screening for AA that Uisce Éireann carried out in relation to the RWRP-SE, which again concluded that the management option types arising from the RWRP-SE had the potential to give rise to LSEs on European sites, in view of the sites' conservation objectives. Accordingly, AA of the RWRP-SE was considered to be required. The AA Screening Report for the RWRP-SE is provided at Appendix A to this NIS.

1.4 This Report

This is the NIS which has been prepared to support the AA of the RWRP-SE. This NIS has been prepared by Jacobs for Uisce Éireann having regard to the requirements of the EU Habitats Directive (Directive 92/43/EEC) (the Habitats Directive) on the Conservation of Natural Habitats and of Wild Fauna and Flora in particular the provisions of Article 6(3), as transposed into Irish law through the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477/2011). As the national public water authority, the responsibility for carrying out the AA of the RWRP-SE lies with Uisce Éireann. The NIS for the RWRP-SE was released for public consultation along with the draft RWRP-SE and other supporting documentation. The NIS will also be published alongside the final RWRP-SE and an AA Determination, which will set out the conclusions of the Appropriate Assessment carried out by Uisce Éireann, as informed by the NIS, public consultation and other prescribed matters as appropriate.

1.5 Legislative Context for Appropriate Assessment

The Habitats Directive provides legal protection for habitats and species of European importance. Articles 3 to 9 provide the legislative means to protect habitats and species of community interest through the establishment and conservation of a European Union–wide network of sites known as the "Natura 2000 network" (hereafter referred to as "European sites"[1]). European sites comprise Special Areas of Conservation (SACs[2]) and Special Protection Areas (SPAs).

1.5.1 Public Authorities and Appropriate Assessment

The duties of public authorities in relation to nature conservation are stated in the European Communities (Birds and Natural Habitats) Regulations, 2011 (as amended) (the Habitats Regulations 2011). Uisce Éireann is defined as a 'public authority' for the purposes of the Habitats Regulations 2011.

The first step of the AA process is to carry out a screening to establish whether, in relation to a particular plan or project, there is potential for likely significant effects (LSEs) to any European site(s). Specifically, Regulation 42(1) states:

"Subject to Regulation 42A a screening for Appropriate Assessment of a plan or project for which an application for consent is received, or which a public authority wishes to undertake or adopt, and which is not directly connected with or necessary to the management of the site as a European Site, shall be carried out by the public authority to assess, in view of best scientific knowledge and in view of the conservation objectives of the site, if that plan or project, individually or in combination with other plans or projects is likely to have a significant effect on the European site.".

Regulation 42A applies to situations where the Minister for Housing, Local Government and Heritage is the person responsible for making or adopting the relevant plan or project, so is not applicable in respect of NWRP.

Regulation 42(6) states that:

[1] "European site" replaced the term "Natura 2000 site" under the European Union (Environmental Impact Assessment and Habitats) Regulations, 2011 (S.I. No. 473 of 2011).

[2] In Ireland there are both SACs and 'candidate' SACs (cSACs). The 'candidate' Special Areas of Conservation (cSACs) are considered candidates until the European Commission approves and ratifies the final list of cSACs. cSACs are afforded the same protection as SACs. The process of making cSACs SACs by means of Statutory Instrument has begun. While this process is ongoing, the term SAC will be used, in conformance with nomenclature used in NPWS databases.

"The public authority shall determine that an Appropriate Assessment of a plan or project is required where the plan or project is not directly connected with or necessary to the management of the site as a European site and if it cannot be excluded, on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site".

In the context of Article 6(3), Uisce Éireann must carry out screening for AA of the RWRP-SE to assess whether, on the basis of objective scientific information, the Plan, individually or in-combination with other plans or projects, is likely to have a significant effect on a European site. If this screening determines that it cannot be excluded, on the basis of objective scientific information, that the Plan, individually or in combination with other plans or projects, will have a significant effect on a European site, then Uisce Éireann must determine that an Appropriate Assessment of the plan is required.

To assist Uisce Éireann in carrying out any Appropriate Assessment that may be required following screening, Uisce Éireann must prepare a Natura Impact Statement (NIS), which is a report comprising the scientific examination of a plan or project and the relevant European Site or European Sites, to identify and characterise any possible implications of the plan or project individually or in combination with other plans or projects in view of the conservation objectives of the site or sites, and any further information including, but not limited to, any plans, maps or drawings, scientific information or data required to enable the carrying out of an Appropriate Assessment.

In carrying out the Appropriate Assessment, the Habitats Regulations 2011 require Uisce Éireann to take into account:

- The NIS;
- Any other plans or projects that may, in combination with the plan or project under consideration, adversely affect the integrity of a European site;
- Any supplemental information furnished in relation to any such report or statement;
- If appropriate, any additional information furnished in relation to the NIS;
- Any information or advice obtained by Uisce Éireann;
- If appropriate, any written submissions or observations made to Uisce Éireann in relation to the application for consent for the Plan; and
- Any other relevant information.

Following the Appropriate Assessment process, Uisce Éireann must then only adopt the RWRP-SE after having determined that the Plan shall not adversely affect the integrity of a European site.

1.6 Overlap with Strategic Environmental Assessment

A Strategic Environmental Assessment (SEA) of the RWRP-SE is being carried out concurrently with the AA process. SEA is required under the EU Council Directive 2002/42/EC on the Assessment of the Effects of Certain Plans and Programmes on the Environment (the SEA Directive) as transposed into Irish Regulations[3]. The purpose of SEA is to enable plan-making authorities to incorporate environmental

[3] In Ireland, the SEA Directive has been transposed into national legislation through S.I. No. 435 of 2004 (European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004, as amended by S.I. No. 200 of 2011 (European Communities (Environmental Assessment of Certain Plans and Programmes) (Amendment) Regulations 2011). Also, S.I. No. 436 of 2004 (Planning and Development (Strategic Environmental Assessment) Regulations 2004, as amended by S.I. No. 201 of 2011 (Planning and Development (Strategic Environmental Assessment) (Amendment) Regulations 2011).

considerations into decision-making at an early stage and in an integrated way throughout the plan making process and to:

- Identify, evaluate and describe the potential significant environmental effects of implementing the RWRP-SE;
- Ensure that identified significant effects are communicated, mitigated and that the effectiveness of mitigation is monitored;
- Identify beneficial (and neutral) effects, and to ensure these are communicated; and
- Provide an opportunity for stakeholder and public involvement.

There is a degree of overlap between the requirements of the SEA and AA and in accordance with best practice, an integrated process has been carried out between the development of the RWRP–SE, the SEA and the AA, such as sharing of baseline data where relevant, cohesive assessment of the potential ecological effects of the RWRP–SE on European sites, their qualifying features, and clarification on more technical aspects of the RWRP. These processes together have informed and shaped the development of the RWRP–SE. Uisce Éireann prepared an Environmental Report for the purposes of SEA, which was published for consultation along with this NIS and the RWRP-SE.

Figure 1.4 below outlines the SEA and AA Stages and how they align with the development of the RWRP–SE.

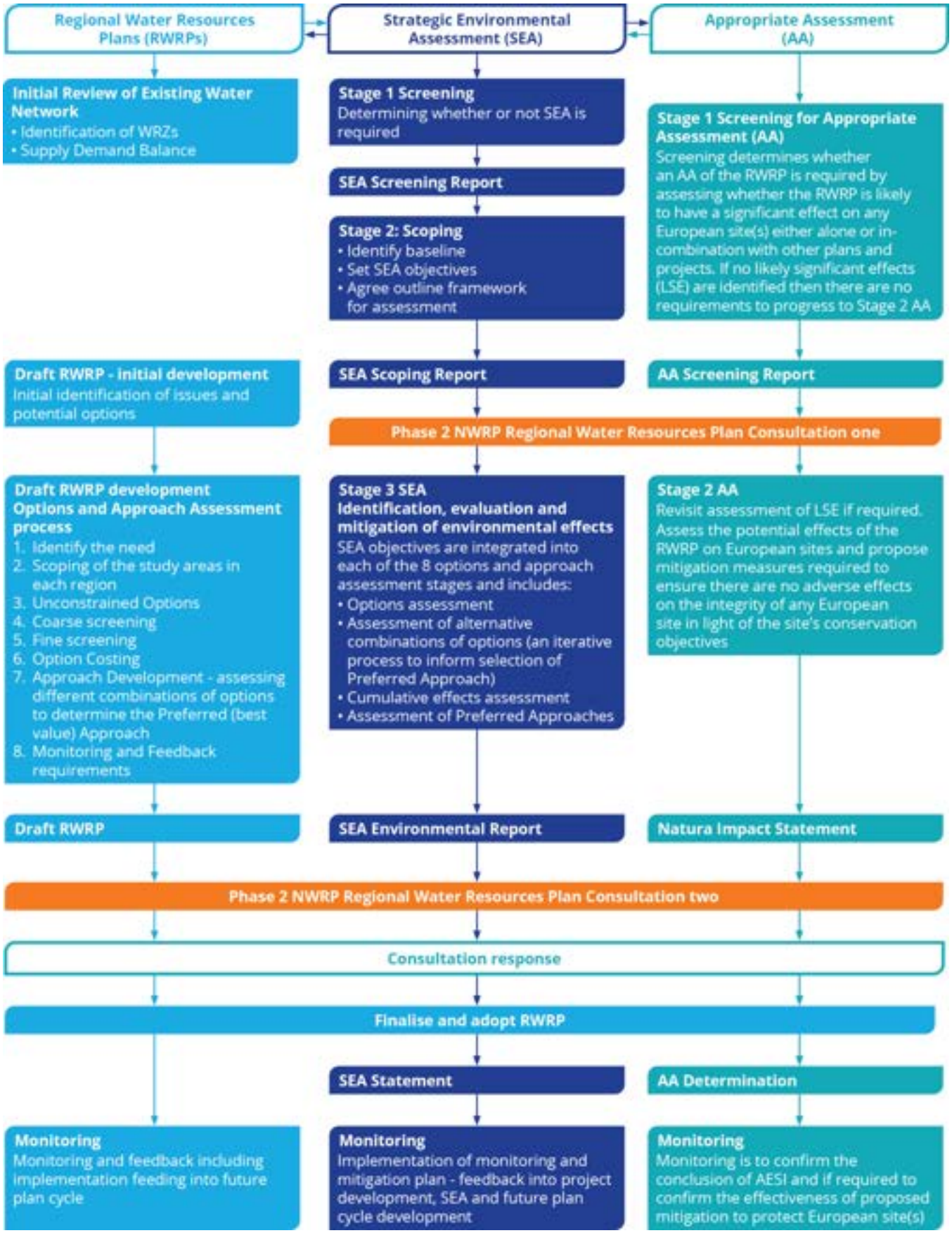

Figure 1.4 - RWRP development with SEA and AA process

1.7 Consultation

Uisce Éireann presented the draft RWRP-SE for consultation alongside the draft NIS and the draft SEA Environmental Report. Uisce Éireann took into account submissions and observations relevant to Appropriate Assessment (AA) matters as part of the overall AA process. The AA Determination to be issued alongside this final RWRP-SE will record how those submissions have informed the overall AA.

Consultation on the draft RWRP-SE was during the period 11th July 2023 through to the 3rd October 2023. Submissions in relation to AA made by email or post were accepted until Tuesday 3rd October 2023.

Email: nwrp@water.ie

Post: National Water Resources Plan, Uisce Éireann, PO Box 13216, Glenageary, Co Dublin.

Freephone: 1800 46 36 76

All feedback received has been reviewed by the NWRP team and our responses published. Following the consultation, we have published a final version of the RWRP-SE on www.water.ie/nwrp

Uisce Éireann applied the Options Assessment and Preferred Approach Methodology set out in the adopted Framework Plan to each water supply. This allowed Uisce Éireann to develop a nationwide programme of short, medium and long-term options that were presented for consultation within the Regional Plans. The Regional Plans once adopted will be used to inform future regulated capital investment plans and operational plans.

Consultation on this remaining Regional Water Resources Plan (RWRP-SE) including the corresponding SEA Environmental Report and Natura Impact Statement was the final public consultation of Phase 2 of NWRP.

2 Assessment Methodology

2.1 Stages of Appropriate Assessment

The methodology for undertaking assessment in relation to AA has evolved from European Commission guidance "Commission Notice Assessment of plans and projects in relation to Natura 2000 sites - Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC 2021/C 437/01" (September, 2021) and Irish guidance from the former Department of Environment, Heritage and Local Government "Appropriate Assessment of Plans and Projects in Ireland: Guidance for Planning Authorities" (Revised December 2010). The entire process can be broken down into four stages (Article 42/43 of the Habitats Regulations 2011), as outlined below. If at any stage in the process it is determined that there will be no implications for the European site in view of the site's conservation objectives, the process is effectively completed. The four stages are described below.

Stage 1 - Screening for Appropriate Assessment (AA)/Test of Likely Significance: Screening determines whether an AA is required by determining if the project or plan is likely to have a significant effect(s) on any European site(s) either alone or in-combination with other plans or projects, in light of the site's conservation objectives (see Figure 2.1).

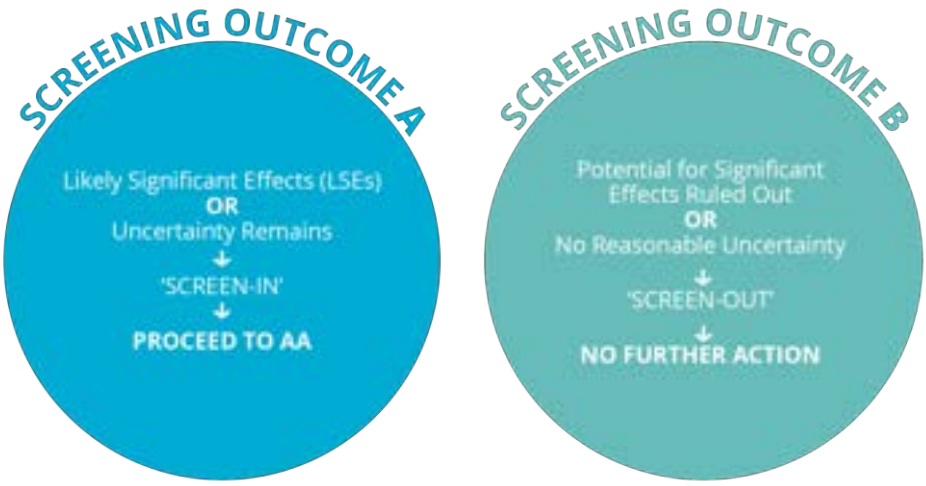

Figure 2.1 - Screening for Appropriate Assessment

Stage 2 - Appropriate Assessment: If the screening has determined that AA is required, the competent authority then considers the effect of the project or plan on the integrity of the European site(s). The AA considers the structure and function of European sites, their conservation objectives and effects from the project/plan both alone and in-combination with other projects or plans. Where Adverse Effects on Site Integrity (AESI) are identified, mitigation measures are proposed as required to avoid compromising the integrity and conservation objectives of the European site(s). The information and data to inform the AA process is documented within an NIS. This is provided to the competent authority to facilitate its AA of the plan or project (along with other factors including submissions and observations received through public consultation, as detailed above).

Stage 3 - Assessment of Alternative Solutions: Following AA, including mitigation proposals, if AESI remain, or uncertainty remains and the project/plan is to be progressed, an Assessment of Alternative Solutions is required under the provisions of Article 6(4) of the Habitats Directive. This process examines the alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the

integrity of the European site. If no alternatives exist, or all alternatives would result in adverse effects on the integrity of a European site, then either the process moves to the next stage or the project is abandoned.

Stage 4 - Imperative Reasons of Over-Riding Public Interest (IROPI): In the unlikely event where an Assessment of Alternative Solutions fails to identify any suitable alternatives, then for a project or plan to be progressed it must meet the requirements of IROPI. In this case the provisions of Article 6(3) cannot be met and therefore, the provisions of Article 6(4) are used. If in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan should proceed, thus compensatory measures are implemented to maintain the coherence of the European site network in the face of adverse effects to the integrity of the site(s).

2.2 Approach to AA of Regional Water Resource Plans

RWRPs are required to identify specific water resource options to address predicted SDB deficits in a given WRZ within a defined region. The approach to this AA takes consideration of their strategic nature and uses objective information to determine whether the Plan, in this case the RWRP-SE, have LSEs for European sites in the manner outlined in *Commission of the European Communities v United Kingdom of Great Britain and Northern Ireland* (Court of Justice of the European Union, Case C-6/04, Opinion of Advocate General Kokott)[4] and the Waddenzee case (Court of Justice of the European Union, C-127/02).

2.2.1 Application of the AA process at Plan level

In the context of AA screening, when applying the 'test of significance' the test is of the "likelihood" of effects rather than the "certainty" of effects. In accordance with the Waddenzee Judgement[5], a likely effect is one that cannot be ruled out based on objective information and is underpinned by the precautionary principle and the test of beyond reasonable scientific doubt. This test therefore sets a low bar: a plan should be considered 'likely' to have an effect if the competent authority (in this case Uisce Éireann) is unable (on the basis of objective information) to exclude the possibility that the plan could have significant effects on any European site, either alone or in-combination with other plans or projects. An effect is considered to be 'significant' if it could undermine a European site's conservation objectives.

The methodology for undertaking screening for AA can be applied at both a project and plan level assessment. The suitability of the data and information used and any decisions flowing from its use in the RWRP-SE assessment have to meet the provisions and requirements of the Habitats Directive. The strategic assessments at the plan level will inevitably be undertaken at a higher level than would be the case for projects. However, the RWRP-SE does not provide consent for any future projects arising from it or future iterations of the Plan but, demonstrates that the protection for the European site network is suitably considered and achievable in the context of the remit of the Plan. Also, any future project level AA screenings and/or NIS will have regard for the plan level AA screening as the projects have been identified or specified from the RWRP-SE. To note, all of Uisce Éireann's projects are screened for AA. Therefore, all projects arising from the RWRP-SE will additionally be required to go through individual environmental assessments (including AA screening and if needed AA). These will be obligatory in

[4] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A62004CC0006 (Accessed, November 2023)
[5] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:62002CJ0127 (Accessed, November 2023)

support of planning applications (where a project requires planning permission) or in support of licensing applications (for example, for new or increased surface or groundwater abstractions).

2.2.2 Compliance of the RWRP-SE with the Habitats Directive

The RWRP-SE identifies needs in terms of quantity, quality and reliability, and uses a methodology (Option Assessment Methodology) to develop interventions to address this need. The AA Screening Report for the RWRP-SE is provided in Appendix A, and at a high level, assessed the option types that were likely to arise from the RWRP-SE; that is because not all of the Preferred Approaches (PAs) were fixed at the time the AA screening was undertaken. The AA screening for the RWRP-SE concluded that the management option types arising from the RWRP-SE had the potential to give rise to LSEs on European sites, in view of the sites' conservation objectives. Accordingly, AA of the RWRP-SE was considered to be required. All of the PAs once fixed (following MCA analysis) were subsequently considered for their potential for LSE as part of this NIS for the RWRP-SE (see Appendix C).

2.3 Guidance documents in relation to Appropriate Assessment

The requirements of Article 6 of the Habitats Directive for the RWRP-SE have been applied having regard to the following guidance documents:

- AA of Plans and Projects in Ireland: Guidance for Planning Authorities (Department of Environment, Heritage and Local Government, 2010a);
- Appropriate Assessment Screening for Development Management. OPR Practice Note PN01. (Office of the Planning Regulator, 2021).
- Assessment of Plans and Projects in Relation to Natura 2000 Sites – Methodological Guidance on Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission, 2021a);
- Guidance document on the strict protection of animal species of Community interest under the Habitats Directive (European Commission, 2021b);
- Communication from the Commission on the Precautionary Principle (European Commission, 2000);
- Guidance Document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: Alternative Solutions, Imperative Reasons of Overriding Public Interest, Compensatory Measures, Overall Coherence, Opinion of the Commission (European Commission, 2007);
- Marine Natura Impacts Statements in Irish Special Areas of Conservation. A working Document (Department of Arts, Heritage and the Gaeltacht, 2012); and
- Managing Natura 2000 sites: The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC (European Commission, 2018).

The following circulars have also been used:

- AA under Article 6 of the Habitats Directive: Guidance for Planning Authorities. Circular NPW 1/10 and PSSP 2/10 (Department of Environment, Heritage and Local Government, 2010b);
- AA of Land Use Plans. Circular Letter SEA 1/08 & NPWS 1/08 (Department of Environment, Heritage and Local Government, 2008a);
- Compliance Conditions in respect of Developments requiring (1) Environmental Impact Assessment (EIA); or (2) having potential impacts on Natura 2000 sites. Circular Letter PD 2/07 and NPWS 1/07 (Department of Environment, Heritage and Local Government, 2007a);
- Guidance on Compliance with Regulation 23 of the Habitats Directive. Circular Letter NPWS 2/07 (Department of Environment, Heritage and Local Government, 2007b); and

- Water Services Investment and Rural Water Programmes – Protection of Natural Heritage and National Monuments. Circular L8/08 (Department of Environment, Heritage and Local Government 2008b).

2.4 Guidance Principles and Case Law

A number of cases have been brought to both the national and European courts in relation to the AA process. Irish departmental guidance (Department of Environment, Heritage and Local Government, 2010a)[6] in relation to AA was published over 10 years ago. Therefore, recent case law has, in many cases, superseded this guidance. However, recent guidance from the OPR (2021)[7] in relation to AA screening has now been published and considered in this assessment. European Court of Justice (ECJ) rulings and European Commission (EC) publications have also been considered in the preparation of the NIS for the RWRP-SE.

2.5 Consideration of the protection of European sites

The RWRP-SE including the methodology for option selection has the protection of European sites and environmental considerations at the forefront. Set out below are the measures employed to ensure the protection of European sites.

2.5.1 Sustainable Abstraction

At the end of 2022, the Government passed the Water Environment (Abstractions and Associated Impoundments) Act, 2022 (the Abstractions Act) which will ensure that national abstractions align with the requirements of the Water Framework Directive. The Abstractions Act has not yet commenced and the associated regulations and guidelines which will further detail the types of assessment and national methodology to be used have not yet been published and are not yet in place.

In addition, the exact level of abstraction at each source will depend on future licensing processes, with the EPA as the relevant adjudicator. As the objective of the plan is to achieve safe, secure, reliable and sustainable supplies, any new abstractions proposed to be developed by Uisce Éireann as part of this plan will be based on conservative assessments of sustainable abstraction. This will ensure that water supplies continually improve in terms of environmental sustainability.

Based on initial desk-based 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.

Uisce Éireann has taken a conservative approach in identifying sustainable abstractions for new options and considered the environmental impact of its existing abstractions as well as the potential resources or water quality improvements. Uisce Éireann considered abstraction sustainability in relation to identifying levels of sustainable abstraction. Uisce Éireann understands that the protection of the aquatic environment/ habitat not only requires the protection of water quality but also necessitates the protection and maintenance of physical habitat, hydrological processes and regimes and broader biological diversity which in the context of this NIS support the conservation objectives of European sites. WFD

[6] https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf (Accessed, November 2023)
[7] https://www.opr.ie/wp-content/uploads/2021/03/9729-Office-of-the-Planning-Regulator-Appropriate-Assessment-Screening-booklet-15.pdf (Accessed, November 2023)

waterbody status has been taken into account through a review of existing abstractions and in the identification of new options, thus ensuring new options can meet sustainable abstraction criteria.

Using desktop assessments, the sustainable 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[8]. The application of these abstraction standards will help to ensure that any new or increased abstractions from rivers designated as SACs (which require "Good" and/or "High" status water quality) will align with the conservation objectives of these sites. Sustainable abstraction standards for lakes are similarly set at 5% (for lakes requiring "High" status e.g. oligotrophic waterbodies) and 10% of Q50.

New options that are developed by Uisce Éireann must meet those criteria and are not otherwise considered as part of the Plan. As part of the Plan, Uisce Éireann do consider some options that are not new options, but were previously proposed. However, if these do not meet the criteria for sustainable abstraction they are eliminated at Coarse Screening stage unless access to site investigation or other data shows that these proposed abstractions are sustainable and consistent with the protection of European sites. Application of these sustainable abstraction limits at initial option development and during Coarse Screening will protect European sites by eliminating many options with the potential to have adverse effects on the integrity of European sites.

However, these are plan level assessments and will be supplemented by the comprehensive site investigations and surveys, including hydrological surveys, that will be carried out in respect of the Preferred Approaches as delivery of the individual projects from the NWRP progresses. Construction related impacts associated with new or upgraded infrastructure related to surface water abstractions also need to be assessed at project level. For example, for an option that has its abstraction source within a designated European site, it would need to be confirmed whether or not the conservation objectives can be protected within sustainable abstraction limits based on the standard rules.

2.5.2 Coarse Screening

The Coarse Screening applied as part of the Options Assessment Methodology (detailed in the Framework Plan) for identifying the Preferred Approach had environmental considerations at the forefront of the assessment. All options considered to have a significant impact on the environment (e.g. options that may result in waterbody not achieving "High" or "Good" status under WFD) were removed at Coarse Screening stage. Some examples of options removed on environmental grounds, which in turn could not provide protection of European sites include:

- Raw water transfer, which was rejected to avoid the risk of spread of Invasive Non-Native Species (INNS) cross catchment; and
- Options where the yield assessment identified that the proposed abstraction would not be within the sustainable abstraction range as set out above in Section 2.5.1 (e.g. a quantity of water above the sustainable abstraction range was required to resolve the deficit).

All options removed at Coarse Screening are detailed in the individual Study Area Technical Reports, these are provided in Appendix 1-3 of the RWRP-SE. Any options removed due to potential significant

[8] Two sources: (1) UK Environmental Standards and Conditions (Phase 1), (2008). UK Technical Advisory Group on the Water Framework Directive. (2) Quinlan, C. & Quinn, R. (2018). Characterising environmental flows in Ireland and what this means for water resource management in Ireland. Irish National Hydrology Conference 2018.

impacts on the environment (including European sites) are summarised in Chapter 4 of this report within each Study Area overview (see Sections 4.2.2, 4.3.2 and 4.4.2).

2.5.3 MCA scoring/Identification of LSEs and integration of AA into optioneering process

Detailed information on the Option Assessment Methodology is included in Chapter 3, Section 3.4 of the Framework Plan NIS. The Multi-Criteria Analysis (MCA) scoring undertaken at Fine Screening stage feeds into the process for identifying Preferred Approaches for each WRZ. Feasible options are assessed individually and in-combination to determine the Preferred Approach. Options are then tested against six approaches which were selected to align the Framework Plan and Regional Plans with all relevant government policy. The six approaches are summarised in Table 2.1 below.

Table 2.1 - Range of Approaches to Test Feasible Options

Approaches Tested	Description	Policy Driver
Least Cost	Lowest Net Present Value (NPV) cost in terms of Capital, Operational, Environmental and Social and Carbon Costs.	Public Spending Code
Best Appropriate Assessment (Best AA)	Lowest score against the European Sites (Biodiversity) sub-criteria question: • **Score = 0** equates to no LSEs. If these 0 scoring options meet the deficit/plan objectives, they are automatically picked as the Preferred Approach. • **Score = -1 or -2** equates to LSEs that can be addressed with general/standard mitigation measures (increased difficulty to mitigate identified by lower negative score). • **Score = -3** equates to LSEs that may be harder to mitigate or require significant project level assessment. Higher scoring options identified where possible.	Habitats Directive
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.	Statutory Obligations under the Water Supply Act and Drinking Water Regulations
Best SEA Environmental	This is the option or combination of options with the highest total score across the 19 No. SEA MCA sub-criteria questions	SEA Directive and WFD
Most Resilient	This is the option or combination of options with the highest total score against the resilience criteria.	National Adaptation Plan
Lowest Carbon	This is the option or combination of options with the lowest embodied and operational carbon cost	Sectoral Adaptation Plan

The Fine Screening scoring for the European sites (biodiversity) question identifies at a high-level potential for LSEs from an option. Any option with a score of -1 to -3 has identified LSEs and is taken forward to AA (Stage 2 of the AA process) and assessed within the NIS. The score essentially identifies

LSEs with varying implications for European sites (see Table 2.2 for further detail on the scoring criteria applied).

Table 2.2 - MCA Scoring criteria in relation to identification of LSEs

Score	Comment
0	Those options scoring 0 are those where no LSEs on a European site have been identified (based on desktop review). During the optioneering process Uisce Éireann identify if these 0 scoring options meet the objectives of the RWRP-SE and if they do they are automatically picked as the Preferred Approach.
-1	Identified that the option has potential for LSE (generally construction related impacts). However, it is considered that these LSEs will not result in AESI with standard best practice and in some cases specific mitigation applied. These options are not considered to lead to AESI based on the RWRP-SE level rules/protective measures applied (see sections 2.5.1 and 2.5.2 above) and desktop information available at the time of assessment. *Example of option scoring -1: Option may include works which are hydrologically linked to an SAC some distance downstream.*
-2	Identified that the option has potential for LSE (generally construction related impact). However, it is considered that these LSEs, although harder to mitigate will not result in AESI with standard best practice project and more detailed specific mitigation (for example pollution control compliant with legislation to protect the general environment and not always specifically for European sites or their Qualifying Interest (QI) features). These options are not considered to lead to AESI based on the RWRP-SE level rules/protective measures applied (see sections 2.5.1 and 2.5.2 above) and desktop information available at the time of assessment. *Example of option scoring -2: Option may include works which are hydrologically linked to an SAC, a direct crossing of an SAC or disturbance related impacts to an SPA.*
-3	Identified that the option has potential for LSEs that may be more complex to mitigate than -1 or -2 scoring options or where uncertainty around potential impacts remains (uncertainty may remain until site level assessments are carried out) and although deemed feasible through Stage 2, may require a higher burden of site-based proof to succeed if it is ever progressed to project level. *Example of option scoring -3: Option may include construction works within an SAC, surface water abstraction from an SAC or groundwater abstraction outside an SAC but with potential hydrological links to an SAC supporting groundwater dependent habitats (GWDHs) or species.*

NB. Score of -1, -2 or -3 = potential LSEs have been identified at Fine Screening stage <u>in the absence of mitigation</u> (screening for AA cannot take mitigation into consideration). To note all of the Preferred Approaches are reviewed in the NIS to ensure that all potential LSEs have been identified at Fine Screening stage taking account of any further information that may be available when undertaking the assessment to inform AA.

Screening for AA of the Preferred Approaches for the SE region is provided in Appendix A and the LSEs are in Appendix C. A list of the European designated sites within the SE region is listed within Appendix B of this report.

2.5.4 Plan Level Protection of European sites

Plan level protection of European sites has been provided for within the RWRP-SE. As outlined in Section 2.5.2 of this NIS, options with potential for significant impacts on the environment, including options that could result in AESI are removed at coarse screening. Furthermore, as part of the feedback loop from the NIS for the Plan, a better approach to options with LSE i.e. options with -1 to -3 score for biodiversity at Fine Screening are identified where possible (especially in respect to -3 scores due to the potential complexity of implementation at the project stage e.g. an option that meets the RWRP-SE objectives and doesn't score -3). Because it is possible that all of the potential impacts identified for even a -3 scoring option can be entirely ruled out through project level investigation and analysis or avoided through project level mitigation, the -3 scoring option for biodiversity may be progressed as the Preferred Approach. General and option specific mitigation has been provided for within the Plan (see Section 6.3.1-6.3.5 of this NIS).

The Preferred Approach is the approach that performs best, against the approach categories set out in section 7.2.1 of the RWRP-SE, at plan level. The identification of a Preferred Approach at a plan level does not confer any consent to develop a project, nor does it preclude other feasible options being considered subsequently. The Preferred Approach as well as alternatives will be taken forward for consideration at project level and subject to further detailed assessments and Statutory Processes in the usual way.

2.6 Assessment Methodology

2.6.1 "Source-pathway-receptor" model

The "source-pathway-receptor" model was used to assess the Preferred Approach for the SE region (various Preferred Approaches identified at both WRZ and Study Area level). This assessment was undertaken in consideration of all potential impact pathways connecting elements of the RWRP-SE to European sites in view of their conservation objectives.

2.6.2 Transboundary Effects

The RWRP–SE solely covers Uisce Éireann's operational area for the South East which lies approximately 130km from the boundary between the Republic of Ireland and Northern Ireland (NI). An assessment was undertaken to determine if there was a source-pathway between designated sites in NI and the SE region.

2.6.3 Desktop study

The following data sources were consulted for background environmental information in producing this NIS:

- Online data available on European sites as held by the NPWS from www.npws.ie – including site synopsis, conservation objectives and other relevant supporting documentation;
- GIS data for European site boundaries obtained in digital format online from the NPWS;
- Article 17 Overview Report Volume 1 (NPWS, 2019a);

- Article 17 Habitat Conservation Assessments Volume 2 (NPWS, 2019b);
- Article 17 Species Conservation Assessment Volume 3 (NPWS, 2019c);
- Evaluating the Influence of Groundwater Pressures on Groundwater-Dependent Wetlands STRIVE Report (EPA, 2013);
- National Biodiversity Action Plan 2017-2021 (Department of Culture, Heritage and the Gaeltacht, 2017);
- Draft Ireland's 4th National Biodiversity Action Plan 2023-2027 (Department of Housing, Local Government and Heritage, 2022);
- Environmental Protection Agency (EPA) rivers and water quality data online at https://gis.epa.ie/EPAMaps/;
- The Environmental Sensitivity Mapping (ESM) online at https://enviromap.ie/;
- Northern Ireland Environment Agency (NIEA) Natural Environment Map Viewer online at https://appsd.daera-ni.gov.uk/nedmapviewer/;
- Draft River Basin Management Plan for Ireland 2022 – 2027 (Department of Housing, Local Government and Heritage, 2022); and
- Data from the Geological Survey Ireland (GSI).

2.6.4 Option comprising existing groundwater abstraction

Site specific data is available in some cases, however, location, abstraction rate(s) and site configuration are often the minimum information available. The operational data provides useful information on the yield, and assumptions can be made around the average production from each site. It can be assumed the average abstraction value is an initial estimate of the yield. Most local authorities in the case of development of groundwater sources would likely have drilled and sought the maximum yield possible through 72 hours pumping tests. This provides an initial yield. Additional information on performance in prolonged dry weather periods provides supporting information on yields. Data collected on site is used to improve the yield and impact estimates.

2.6.5 Option comprising new groundwater abstraction

As part of the desk-based assessment specific buffers will be used to identify the Zone of Influence (ZoI) of an option on European sites as outlined below.

Irish departmental guidance on the Zone of Influence (ZoI) considered during the AA process states the following:

"A distance of 15km is currently recommended in the case of plans, and derives from UK guidance (Scott Wilson et al., 2006). For projects, the distance could be much less than 15km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects".

However, the actual extent of the ZoI depends on the effect pathway, as well as the specific nature of different habitats/species for which a European site is designated including functional and supporting habitat (OPR, 2021). Therefore, for these reasons the ZoI must be scientifically defined and based upon the "source-pathway-receptor" model.

As part of the desk-based assessment specific buffers will be used to identify the ZoI in relation to groundwater abstraction. As outlined below however, these buffers represent typical groundwater flow distances and only serve as a guide, and where appropriate site-specific information is used instead. To assist with the high-level assessments, the catchment area to the abstraction is also considered. The Zone of Contribution (ZOC) is defined 'as the area needed to support an abstraction from long-term groundwater recharge' (Groundwater Protection Scheme DELG *et al*, 1999). The ZOC is defined and delineated as a means to protect the source, and guide decision making. Long term recharge and abstraction rates dictate the size of the ZOC. As such the ZOC, recharge and abstraction rate enable a water balance. It can be used to assess if a deficit can be potentially met with the existing abstraction or if an alternative solution is required i.e. (i) new well could be drilled nearby (ii) new location needs to be sought, or (iii) alternative solution altogether is required whether it be groundwater or surface water. Typical groundwater flow distances are provided for the various aquifer category types[9]. The domain size associated with these flow systems are considered to be 5km in Karstic aquifers, 3km in Productive Fissured bedrock, 1km in Gravel aquifers and 600m in Poorly Productive aquifers. These are the potential domains that will be used when assessing the potential impacts of groundwater abstractions on European Designated sites and/or surface waters within European sites. As this is a conservative consideration, the buffers act as a guide only. They may flag sites within a 'buffer' for further monitoring etc., but where appropriate are overruled by site specific data. Where available, site specific data (pump test results, borehole construction information, geological constraints etc.) can be used for sites within a 'buffer' to suggest no direct linkage between abstraction and GWDTE. In relation to qualifying interests where specific information was available (e.g. detailed conservation objective mapping etc.) this was used in conjunction with ZOC data from hydrologists to inform the assessment. Where detailed information was lacking, a precautionary approach was taken and potential impacts considered and mitigation provided.

2.6.6 All other options

When assessing likely ZoI for all other options the "source-pathway-receptor" model will be applied. European sites with a hydrological link to any given option/Study Area will be considered to be within the ZoI. As such, sites that are outside the boundary of the regional group may also be included in the assessment where there is an effects pathway.

The RWRP-SE covers the South East region of the Republic of Ireland. Therefore, all European sites within this region (core baseline area – see Section 3.5 of the RWRP-SE SEA Scoping Report) and European sites with potential effects pathways located outside the region were initially considered to be potentially within the ZoI of the RWRP-SE.

[9] Daly, D., Fitzsimons, V., Hunter Williams, T. & Wright, G. (2005). "ROCK TYPE VERSUS FRACTURES" – CURRENT UNDERSTANDING OF IRISH AQUIFERS. International Association of Hydrogeologists (IAH) Irish group.

3 Overview of European Sites within the SE Region

3.1 Special Areas of Conservation

SACs cover a variety of habitat types recognised in Annex I of the Habitats Directive. Within the Republic of Ireland, there are 441 SACs, in which there are 16 habitats designated as “priority” habitats owing to their ecological vulnerability (NPWS, 2019a). Habitats for which SACs are designated include lakes, raised bogs, blanket bogs, sand dunes, machair, heaths, rivers, woodlands, estuaries and sea inlets. In addition, the Habitats Directive recognises 28 Annex II species that occur in the Republic of Ireland. Some of the species for which SACs have been designated include, but are not limited to, Atlantic salmon (*Salmo salar*), otter *(Lutra lutra*), lesser horseshoe bat (*Rhinolophus hipposideros*), freshwater pearl mussel (*Margaritifera margaritifera*), twaite shad (*Alosa fallax*), slender naiad (*Najas flexilis*) and Killarney fern (*Trichomanes speciosum*). 12 of the 16 priority habitats can be found in the SE region. There are 33 SACs within the SE region, with some of these SACs supporting various habitats and species that are dependent on surface and/or groundwater sources. A number of significant pressures on these water bodies have been identified (Department of Housing, Planning and Local Government, 2018), including:

- Agriculture;
- Hydromorphological pressures;
- Forestry;
- Urban wastewater;
- Anthropogenic pressures;
- Abstractions; and
- Invasive species.

Of the pressures noted above, water abstraction is of particular relevance to the RWRP-SE. Both existing and new water abstractions from both ground and surface water have been identified as being a potential threat to some Annex I habitats and Annex II species. As discussed in Chapter 2.5.1 sustainable abstraction limits have been set as part of the RWRP-SE to ensure the protection of these Annexed species and habitats. A full list of water dependent species and habitats in the SE region is provided in Appendix F.

3.2 Special Protection Areas

SPAs are designated for the conservation of Special Conservation Interest (SCI)[10] Annex I birds and other regularly occurring migratory birds and their habitats. There are 166 SPAs in the Republic of Ireland, and 14 SPAs within the SE region. The majority of the SPAs located within the SE region are designated for wintering water birds and breeding seabirds/birds of prey with the majority considered to be regularly occurring migratory birds. Over 90% of the Annex I listed species that occur in the SE region on a regular basis belong to the breeding seabird and wintering waterbird groups.

The habitats within these SPA sites include bogs, loughs, estuaries, callows, rivers and reservoirs. Several of these habitats are dependent on surface and/or groundwater sources. Some of the productive marine intertidal zones of bays and estuaries within the SE region are included within SPAs and these

[10] The terms Special Conservation Interest (SCI) and Qualifying Interest (QI) have been used interchangeably throughout the document when referring to Annex I bird species for which an SPA has been designated.

provide vital food resources for several wintering wader species, including knot (*Calidris canutus*), dunlin (*Calidris alpina*) and bar-tailed godwit (*Limosa lapponica*).

Finally, a number of inland wetland sites and areas of bog and upland habitats within the SE region have also been designated as SPAs for wintering water birds and breeding birds. These sites provide important breeding and foraging areas for numerous other species including kingfisher (*Alcedo atthis*) and peregrine (*Falco peregrinus*). Agricultural land is also represented within the SE region SPA network ranging from the extensive farmland of upland areas where hedgerows, wet grassland and scrub offer feeding and/or breeding opportunities for hen harrier (*Circus cyaneus*), to the intensively farmed coastal polderland where internationally important numbers of swans and geese occur. A list of all water dependent QI bird species in the SE region is provided in Appendix G.

3.3 Conservation Objectives

The overall aim of the Habitats Directive is to maintain or restore the favourable conservation status of annexed habitats and annexed species of community interest for which an SAC or SPA has been designated. The conservation objectives (COs) for a European site are set out to ensure that the QIs/SCIs of that site are maintained or restored to a favourable conservation condition. Maintenance of favourable conservation condition of habitats and species at a site level in turn contributes to maintaining or restoring favourable conservation status of habitats and species at a national level and ultimately at the European site network level.

Detailed site synopses for each European site are also available from the NPWS website[11]. In Ireland 'generic' COs have been prepared for all European sites, while 'site specific' COs have been prepared for a number of individual sites to take account of the specific QIs/SCIs of that site. Both the generic and the site-specific COs aim to define the requirements for favourable conservation condition for habitats and species at the site level. Generic COs which have been developed by NPWS encompass the spirit of site-specific COs in the context of maintaining and restoring favourable conservation condition as follows;

- For SACs: "*To maintain or restore the favourable conservation condition of the Annex I habitats and/or Annex II species for which the SAC has been selected*".
- For SPAs: "*To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for the SPA*".

Following on from this, favourable conservation status (or condition, at a site level) of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue to exist for the foreseeable future; and
- The conservation status of its typical species is "favourable".

The favourable conservation status (or condition, at a site level) of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats; and

[11] https://www.npws.ie/protected-sites (Accessed, November 2023)

- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future, and there is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

A full list of the COs and QIs/SCIs that each European site is designated for, as well as the attributes and targets to maintain or restore the QIs/SCIs to a favourable conservation condition are available from the NPWS website[12].

3.4 Overview of European Sites within the South East region

As discussed in Chapter 2, all European sites within the South East region boundary were initially considered to be potentially within the ZoI of the RWRP-SE, therefore potential LSEs on the conservation objectives for these sites will be considered. There is a total of 33 SACs and 14 SPAs within the SE region boundary. There are a further two marine SACs and two marine SPAs that are not within the SE region boundary but are hydrologically linked to it. These sites are Blackwater Bank SAC, Long Bank SAC, Saltee Islands SPA, and Keeragh Islands SPA. Table 3.1 below provides a breakdown of European sites within each Study Area boundary within the SE region boundary. A summary of the European sites within the SE region boundary are shown in Figure 3.1 below.

Table 3.1 - Number of European Sites within each Study Area[13] within the SE region boundary

Study Area	No. of SACs	No. of SPAs
K (Waterford and South Tipperary)	17	7
L (Kilkenny)	7	1
M (Wexford and Wicklow)	14	7

[12] https://www.npws.ie/protected-sites/conservation-management-planning/conservation-objectives (Accessed, November 2023)
[13] Some SACs or SPAs fall within more than one study area.

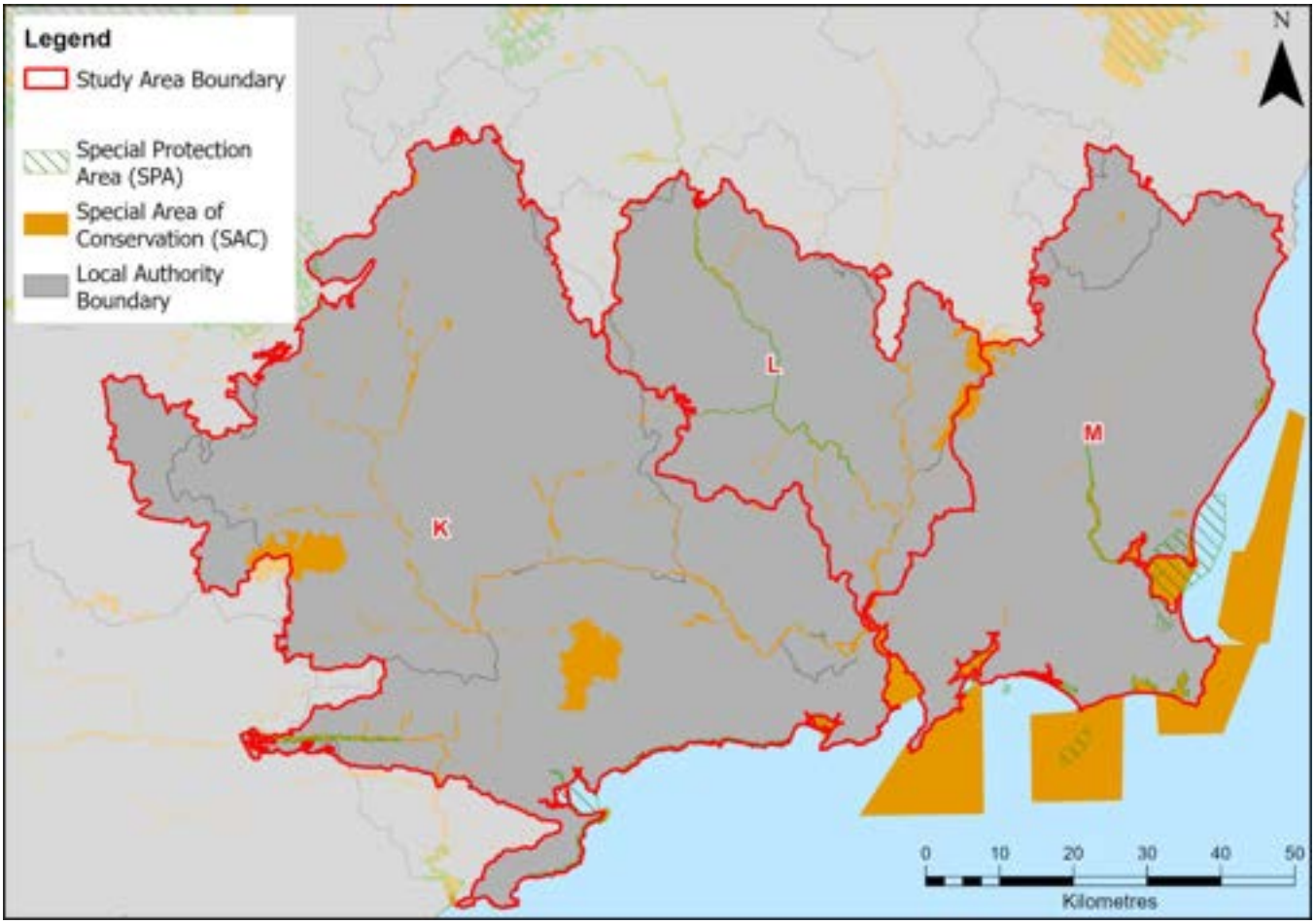

Figure 3.1 - European sites within the South East region boundary

4 South East – Preferred Approach

4.1 Overview of South East

The South East Region includes nine counties: Limerick, Tipperary, Waterford, Kilkenny, Laois, Cork, Carlow, Wicklow and Wexford. It covers approximately 9,200km^2 (representing about 13% of the Republic of Ireland) and extends from the south-east coast, south of Arklow, towards Youghal, Mitchelstown and Limerick in the west. Waterford City is the largest settlement, comprising 14% of the regional population. It is situated on the estuary, Waterford Harbour, which receives flows from the three major rivers draining the region – the Barrow, Nore and Suir.

The RWRP-SE has identified the Preferred Approach for the SE region. The South East Region is subdivided into three Study Areas (see Figure 4.1 below) based on factors such as:

- Groundwater body boundaries;
- Surface water sub-catchments;
- Geographical features;
- WRZ boundaries;
- Local authority functional areas; and
- Appropriate size for an efficient reporting structure.

The NIS has assessed the Preferred Approach options for the three Study Areas and the SE region as a whole.

For ease of assessment each Study Area and the Preferred Approach options for same is discussed in detail in Sections 4.2 to 4.4 below. Detailed information on the Preferred Approach (and how it was reached) for each Study Area is provided in the Study Area reports accompanying the RWRP-SE Plan and summarised in the relevant chapters below.

Figure 4.1 - Group Area 3 Study Areas

4.1.1 Solution Types considered across all Study Areas

When identifying the solutions that might be used to address need within a Study Area, Uisce Éireann have compiled the range of available solutions across three pillars; lose less (leakage reduction), use less (water conservation) and supply smarter (rationalisation etc.).

This enables Uisce Éireann to identify the short, medium- and long-term solutions, and the best combination of options. For each Study Area as part of the Unconstrained Options, measures around leakage reduction, water conservation and supplying smarter are looked at and taken into consideration in the SDB deficit although that is not yet possible for water conservation (see section 4.1.2 below). Any specific measures in relation to leakage reduction and supplying smarter is detailed in the various Study Area reports which are accompanying the RWRP-SE.

4.1.2 Water Conservation

At present, Uisce Éireann is conducting pilot studies in relation to water conservation stewardship in businesses and is actively progressing water conservation messaging campaigns. During drought conditions in 2018 a Water Conservation Order was implemented, in order to protect water supplies and reduce pressure on the natural environment during this period.

In order to measure the benefit of Water Conservation Activities, Uisce Éireann will need to collect and monitor data over a number of years. Due to these data limitations, as part of this NWRP, Uisce Éireann has not been able to apply reductions in demand due to water conservation to the Supply Demand Balance deficit.

4.1.3 Transboundary Effects

There will be no transboundary effects as there is no source-pathway between the SE region and European sites in NI. There will also be no transboundary effects on the basis that there are no shared groundwater WFD units, no possible marine effects and no shared hydrometric areas.

4.2 Overview of Study Area K – Waterford and South Tipperary

The location of Study Area K (SAK) in relation to the SE region is shown in Figure 4.1 above. The majority of the Study Area is split between County Tipperary and Waterford, with some schemes extending into County Kilkenny and Limerick. The total area of SAK is approximately 5,056 km^2 and lies within Limerick, Tipperary, Waterford City, Waterford, Kilkenny, Laois, Cork, and Wexford. The principal settlements (with a population of over 10,000) within SAK are Waterford City, Clonmel, and Tramore (Central Statistics Office, 2016).

There are seventeen SACs and seven SPAs within the SAK boundary as shown in Table 4.1. European sites within SAK where there is potential for LSE are discussed further in Section 6.2.1.

Table 4.1 - Number of European Sites within the SAK boundary

Study Area	No. of SACs	No. of SPAs
K (Waterford and South Tipperary)	17	7

4.2.1 Existing Water Supplies

SAK consists of 75 WRZs supplying a population of approximately 214,979 people via approximately 3,891km of distribution network. The city of Waterford is the largest demand centre, with other notable towns including Clonmel, Tipperary, Tramore, Dungarvan and Thurles. The sources of water supply consist of 26 surface water abstractions and 84 groundwater abstraction sites. The Study Area is summarised in Figure 4.2 below.

Regarding surface water availability, most of SAK is within the large River Suir catchment, with small parts of the Study Area crossing into the coastal Colligan-Mahon catchment and the River Blackwater catchment. The River Suir is one the largest rivers in Ireland, with a total catchment area of 3,542km^2, rising on the slopes of the Devil's Bit Mountain before draining large parts of County Tipperary as it flows south through wide karstified limestone plains. The Suir then turns sharply east to form the border with County Waterford, flowing through Clonmel before turning tidal at Carrick-on-Suir, joining the Nore and Barrow Rivers east of Waterford City, before finally entering the sea at Waterford Harbour. The River Suir is designated as the Lower River Suir SAC, and one of its tributaries, the Clodiagh River (Portlaw), is also designated as a freshwater pearl mussel SAC catchment.

Currently around 60% of the water supplies to SAK come from surface water sources, with most of these abstractions being from the River Suir system. The East Waterford WRZ, by far the largest WRZ in SAK, has three large surface water abstractions feeding the Adamstown WTP near Waterford City to deliver up to 58Ml/d: two river intake sources, Clodiagh (Portlaw) and Mahon Rivers, and the Ballyshonnock Impounding Reservoir source. Other notable surface water sources in SAK include an abstraction from Clodiagh River (Tipperary), near the top of the Suir catchment, feeding Thurles WTP to supply up to 11.46Ml/d to Thurles/Borrisoleigh WRZ. Elsewhere in the Study Area, there are many abstractions from smaller upland river and stream sources. These include the Muskry and College Streams sources which are combined with groundwater to feed Rossadrehid WTP to supply up to 13Ml/d to Galtee Regional WRZ. The Ahernes Glen and Glenbreda Streams feed Goatenbridge WTP to supply up to 11.336Ml/d to Ardfinnan Regional WRZ. Whilst the Gurtnapisha, Walshbog and Cloran Streams are combined with an abstraction from the Anner River to feed Fethard WRZ to supply up to 6.5Ml/d to Fethard & Mullenbawn Regional PWS WRZ.

Overall, 84 groundwater schemes are managed by Uisce Éireann in the region. The predominant aquifer type of the area is made up of poorly productive bedrock (60%), followed by karstic (28%) and productive fissured (12%). There are extensive swathes of regionally important karst aquifer present in the Suir catchment/south Tipperary, which could offer potential for groundwater development. Similar feasible, but challenging, prospects exist in Waterford with an extensive body of productive fissured bedrock stretching from Wexford in the north east to Stradbally on the coast of Waterford.

Devonian old red sandstone consists mainly of coarse and fine sandstones, siltstones, shales, and conglomerates, and along with the Dinantian lower impure limestones, make up the dominant bedrock geology in SAK. The limestones are often characterised by the occurrence of chert and shale bands and are generally less productive than the pure bedded limestones. These sandstones are predominantly of a poorly productive bedrock flow regime and assumed to be generally devoid of intergranular permeability, with groundwater flow occurring predominantly through fractures and faults. Most groundwater flow occurs in the top 15-20m of the aquifer, with levels generally mirroring topography, although deeper flows along fault zones or connected fractures are encountered which can provide

much higher yields. Significant flows can be found at springs issuing from bedding planes marking a change in lithology. However, since the yield often depends on the permeability developed in the uppermost few metres of broken and weathered rock, yields will often decrease markedly in dry spells as the water table falls, and these supplies may therefore be unreliable. Much of western and central Waterford, as well as parts of western Tipperary, is characterised by a larger proportion of old red sandstone bedrock resulting in lower groundwater potential in these areas.

There are extensive swathes of regionally important karst aquifer in some areas, particularly in southern Tipperary. The distribution of permeability and yield is more homogenous where the development of karst has resulted in a more diffuse network of flow pathways. This provides a slightly more reliable flow regime than conduit dominated aquifers, however these karstic environments are still prone to pollution from point sources such as septic tanks, disposal sites and land spreading. A number of large abstractions take place from these pure bedded limestones, namely Mullenbawn spring (0.65 – 2.2Ml/d) and Monroe/Caherclough Borehole (c. 1Ml/d) in South Tipperary. The regionally important aquifers are generally smaller in extent in this part of the country and are banded by locally important old red sandstone.

An extensive body of productive fissured bedrock, made up primarily of volcanics, stretches along southern Waterford to Stradbally at the coast. The most productive yields are sourced from the well-developed fissures in the felsic rhyolites and andesites, which appear to decrease the further south west one moves from Gorey in Wexford. Lower permeabilities and yields can be more common here, with intrusive rocks forming a barrier to groundwater flow. The potential for productive wells becomes less frequent in Co. Waterford due to the greater proportion of intrusive rocks (dykes and sills). Although covering a less extensive area than the Ordovician volcanics, the Devonian Kiltorcan sandstones form a regionally important fissured aquifer and can be found along the base of the Galtee Mountains, while also extending in a narrow band through Waterford, Tipperary to Kilkenny. This type of bedrock has shown to be able to provide good yields (c. 0.7Ml/d at Cappoquin), where permeability depends on fractures and fissures. The cleaner sandstones are likely to have a denser network of fracturing and fracture permeability in the shalier sandstones.

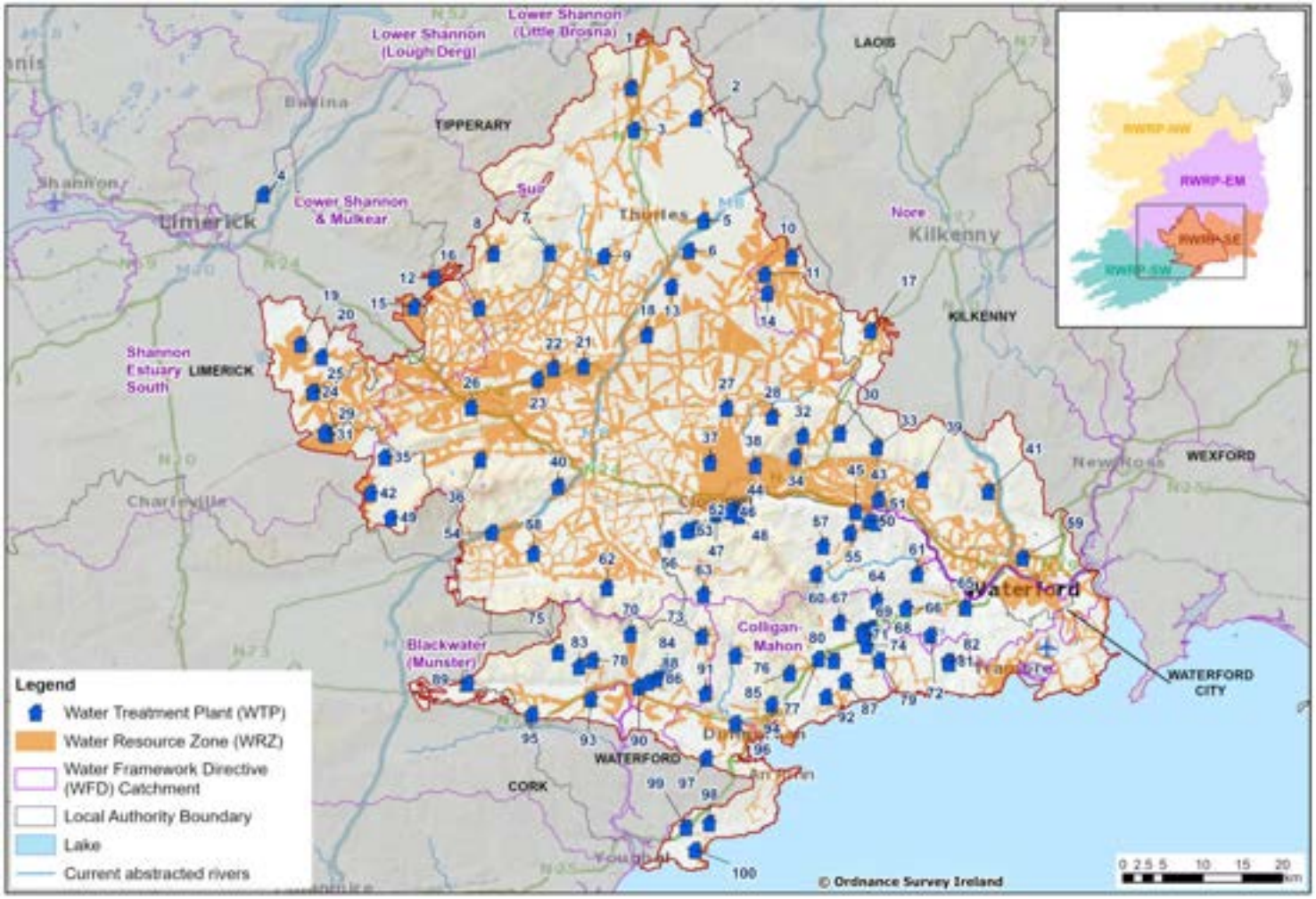

Figure 4.2 - Study Area K Waterford and South Tipperary Summary. See Table 4.2 for list of WTPs referenced on figure

Table 4.2 – WTPs referenced in SAK Summary figure (Figure 4.2)

Index Code	WTP Name	Index Code	WTP Name
1	Templemore (College Hill) WTP	51	Crehanagh WTP
2	Templetouhy WTP	52	Glenary WTP
3	Whitefield WTP	53	Russelstown WTP
4	Clareville WTP	54	Glengarra WTP
5	Two Mile Borris WTP	55	Ballyknock WTP
6	Littleton WTP	56	Kilmanahan WTP
7	Stooke WTP	57	Rathgormack WTP
8	Hollyford WTP	58	Ballylooby Springs WTP
9	Thurles WTP	59	Mullinabro WTP
10	Commons WTP	60	Crottys Lake WTP
11	Coalbrook WTP	61	Portlaw WTP
12	Glengar WTP	62	Goatenbridge WTP
13	Horse & Jockey (Curragheen) WTP	63	Ballyrohan WTP
14	Ballincurry WTP	64	Carrigeen WTP
15	Carrigmore WTP	65	East Waterford (Adamstown)WTP
16	Ironmills WTP	66	Ballyshonnock WTP
17	Callan WTP	67	Fews WTP
18	Dualla WTP	68	Scrahan WTP
19	Herbertstown WTP	69	Pairc an Aonaigh WTP
20	Kilteely WTP	70	Melleray WTP
21	Farranamanagh WTP	71	Kilmacthomas WTP
22	Golden to Cashel Town (Springmount Source) WTP	72	Smoorbeg WTP
23	Thomastown Augmentation WTP	73	Touraneena WTP
24	Hospital WTP 2	74	Ballyogarty WTP

25	Hospital WTP 1	75	Ballysaggart WTP
26	Fawnagown WTP	76	Kilbrien (Ballinakill) WTP
27	Mullinbawn WTP	77	Garrahylish WTP
28	Fethard WTP	78	Carrignagower WTP
29	Knocklong Church Road WTP	79	Ballylaneen WTP
30	Ballinvir WTP	80	Faha WTP
31	Knocklong WTP	81	Dunhill Ballynageeragh WTP
32	Tullohea WTP	82	Dunhill Cois Coille WTP
33	Ahenny (Ahenny) WTP	83	Monatarrif WTP
34	Kilcash WTP	84	Modeligo WTP
35	Galbally WTP	85	Kilrossanty WTP
36	Rossadrehid WTP	86	Moore's Well WTP
37	Monroe WTP	87	Graiguenageeha WTP
38	Templetney WTP	88	Lacken WTP
39	Piltown-Fiddown (Jamestown) WTP	89	Inchinleamy WTP
40	Lissava WTP	90	LCB Cappoquin WTP
41	Mooncoin (Clonassy) WTP	91	Carrowgarriff WTP
42	Ballylanders WTP	92	Stradbally WTP
43	Carrick-on-Suir (Linguan) WTP	93	LCB Lismore Deerpark WTP
44	Clonmel-Poulnagunoge WTP	94	Deelish WTP
45	Coolnamuck WTP	95	LCB Ballyduff WTP
46	Poulavanogue WTP	96	Ballinamuck WTP
47	Glennagad WTP	97	Ballyguiry WTP
48	Lyrenaleara WTP	98	Liskealty WTP
49	Anglesboro WTP	99	Ardmore Grange WTP
50	Garravoone WTP	100	Monea WTP

4.2.2 SAK Options Removed at Coarse Screening

The options detailed in Table 4.3 below were removed at Coarse Screening on environmental grounds.

Table 4.3 - SAK – Options removed at Coarse Screening on environmental grounds

Option Reference	Option Description	Rejection Reasoning
SAK-007	Rationalise Ballylanders, Kilteely, Knocklong/ Hospital and Galbally WRZs to Galtee Regional WRZ [Rossadrehid WTP and new abstraction from River Aherlow].	Abstracting the volume of water required is considered unfeasible.
SAK-010	Rationalise Kilteely and Herbertstown WRZs to Knocklong/Hospital WRZ.	Turbidity issues when over pumping at Hospital BH1 WTP.
SAK-021	Rationalise Kilteely and Herbertstown WRZs to Knocklong/Hospital WRZ.	Abstracting the volume of water required is considered unfeasible.
SAK-022	Increase GW abstraction at Hospital BH1 and upgrade Hospital BH1 WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-023	Increase GW abstraction at Hospital BH1 and upgrade Hospital BH1 WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-024	Increase GW abstraction at Hospital BH2 and upgrade Hospital BH2 WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-025	Increase GW abstraction at Hospital BH2 and upgrade Hospital BH2 WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-034	Rationalise Ballylanders, Kilteely, Knocklong/ Hospital and Galbally WRZs to Galtee Regional WRZ [Rossadrehid WTP and new abstraction from River Aherlow].	Abstracting the volume of water required is considered unfeasible.
SAK-042	Rationalise Ballylanders, Kilteely, Knocklong/ Hospital and Galbally WRZs to Galtee Regional WRZ [Rossadrehid WTP and new abstraction from River Aherlow].	Abstracting the volume of water required is considered unfeasible.

SAK-053	Rationalise Ballylanders, Kilteely, Knocklong/ Hospital and Galbally WRZs to Galtee Regional WRZ [Rossadrehid WTP and new abstraction from River Aherlow].	Abstracting the volume of water required is considered unfeasible.
SAK-061	Increase SW abstraction from River Blackwater (Mullinavat) and upgrade Mooncoin (Clonassy) WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-062	Increase SW abstractionfrom River Blackwater (Mullinavat) and upgrade Mooncoin (Clonassy) WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-063	Increase SW abstraction from Pollanasa River and upgrade Mooncoin (Clonassy) WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-064	Increase SW abstraction from Pollanasa River and upgrade Mooncoin (Clonassy) WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-067	Rationalise South Kilkenny to East Waterford WRZ [new GW abstraction and upgrade Adamstown WTP].	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-070	Interconnect South Kilkenny and East Waterford WRZ for improved resilience and supply deficit from Adamstown WTP.	Abstracting the volume of water required is considered unfeasible.
SAK-072	Increase existing GW abstraction and upgrade Jamestown WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-075	Rationalise Piltown-Fiddown to South Kilkenny WRZ [Mooncoin (Clonassy) WTP].	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-079	Rationalise Callan to Kilkenny City & Bennetts bridge WRZ.	Abstracting the volume of water might be considered unfeasible.
SAK-080	Rationalise Callan to Fethard WRZ [Fethard WTP].	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-082	Interconnect Callan and Fethard WRZ for improved resilience and supply deficit from Fethard WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.

SAK-101	Supply spare capacity to neighbouring WRZs in deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-103	Increase GW abstraction at Templetuohy BH and upgrade Templetuohy WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-108	Increase GW abstraction at Whitefield BH and upgrade Whitefield WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-116	Increase SW abstraction from Collage stream and Muskry stream and upgrade Rossadrehid WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-121	New SW abstraction from Aherlow river and upgrade Rossadrehid WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-131	Rationalise Galtee Regional, Clonmel and Ardfinnan Regional WRZs to the New Shannon Source.	Abstracting the volume of water required is considered unfeasible.
SAK-135	Increase abstraction at Monroe BHs and upgrade Monroe WTP to partly supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-136	Increase abstraction at Monroe BHs and upgrade Monroe WTP to partly supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-137	Increase abstraction at Monroe BHs and upgrade Monroe WTP to partly supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-147	Rationalise Galtee Regional, Clonmel and Ardfinnan Regional WRZs to the New Shannon Source.	Abstracting the volume of water required is considered unfeasible. Not a suitable option for Cork WRZ due to location.
SAK-149	Increase abstraction from Glenary River and upgrade Glenary WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-150	Increase abstraction from Glenary River and upgrade Glenary WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-151	Increase SW abstraction from Poulavanogue stream and upgrade Poulavanogue WTP to address water quality	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.

	issues and partly supply deficit.	
SAK-154	Increase SW abstraction from Glengalla stream [Ahernes Glen Abstraction] and upgrade Goatenbridge WTP to partly supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-155	Increase SW abstraction from Kildanoge stream [Glenbreda Stream] and upgrade Goatenbridge WTP to partly supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-158	Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel [increase GW abstraction].	Abstracting the volume of water required is considered unfeasible.
SAK-160	Rationalise Galtee Regional, Clonmel and Ardfinnan Regional WRZs to the WSP.	Abstracting the volume of water required is considered unfeasible.
SAK-164	Increase SW abstraction from Muiteen [East] River and upgrade Stooke WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-167	Interconnect Dundrum Regional with Fethard Regional WRZs and supply deficit from Fethard Regional WRZ.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-169	New SW abstraction from Muiteen [East] River further south of Stooke WTP to replace existing abstraction and upgrade Stooke WTP	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-170	Rationalise Dundrum Regional to Thurles WRZ.	Abstracting the volume of water required is considered unfeasible.
SAK-175	Rationalise Hollyford to Stooke WTP. Rationalisation within WRZ.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-189	Rationalise Templetney/Brackford Bridge to Clonmel (increase GW abstraction).	Abstracting the volume of water required is considered unfeasible.
SAK-191	Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (increase GW abstraction).	Abstracting the volume of water required is considered unfeasible.

SAK-198	Increase SW abstraction from Crottys Lake and upgrade Crottys Lake WTP to partly supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-210	New SW abstraction from Clodiagh River and upgrade Crottys Lake WTP to partly supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-215	Increase SW abstraction from Burncourt River and upgrade Glengarra WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-224	Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighboring WRZ in deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-229	Increase SW abstraction from Anner River and upgrade Fethard WTP to supply spare capacity to neighbouring WRZ in deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-230	Increase SW abstraction from Anner River and upgrade Fethard WTP to supply spare capacity to neighbouring WRZ in deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-231	Increase SW abstraction from Anner River and upgrade Fethard WTP to supply spare capacity to neighbouring WRZ in deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-234	Increase GW abstraction from Tullohea spring and upgrade Tullohea WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-238	Reintroduce old Toor GWS source and upgrade Tullohea WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-249	Increase GW abstraction from Kilcash Spring and upgrade Kilcash WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-253	New GW abstraction (two wellfields) and treat at Adamstown WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-255	Increase SW abstraction from Clodiagh River and upgrade East Waterford (Adamstown) WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.

SAK-256	Increase SW abstraction from Ballyshonock Impoundment and upgrade East Waterford (Adamstown) WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-257	Increase SW abstraction from Mahon River and upgrade East Waterford (Adamstown) WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-263	Rationalise Glennagad to Clonmel WRZ [Glenary WTP].	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-267	Rationalise Poulavanogue (Waterford) to Clonmel WRZ [Glenary WTP].	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-297	Increase abstraction from exisitng spring and upgrade Glengar WRZ to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-363	Increase SW abstraction from Clodiagh River, Ballyshonock impoundment and Mahon River and upgrade East Waterford (Adamstown) WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-364	Increase SW abstraction from Ballyshonock Impoundment and upgrade East Waterford (Adamstown) (resolve algae issues) WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-368	Increase GW abstraction from existing BH and upgrade LCB Ballyduff WTP to partly supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-369	Increase GW abstraction from existing BH and upgrade LCB Cappoquin WTP to partly supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-370	Increase GW abstraction from existing BH and upgrade LCB Cappoquin WTP to partly supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-376	New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-378	New GW abstraction and upgrade WTP LCB Cappoquin WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.

SAK-395	New SW abstraction from Mahon River and new WTP to supply deficit	Abstracting the volume of water required is considered unfeasible.
SAK-396	Rationalise Ballyogarty to Kilmacthomas WRZ [new SW abstraction from Mahon River]	Abstracting the volume of water required is considered unfeasible.
SAK-401	Rationalise Ballyogarty to Kill/Ballylneen WRZ.	Abstracting the volume of water required is considered unfeasible.
SAK-409	Rationalise Moores Well to Lismore/ Cappoquin/ Ballyduf (LCB) WRZ [new GW abstraction and upgrade Cappoquin WTP].	Abstracting the volume of water required is considered unfeasible.
SAK-434	New SW abstraction from Mahon River and new WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-435	New SW abstraction from Mahon River and new WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-440	Increase GW abstraction from Ballymacarbry two BHs and upgrade Ballyrohan WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-487	New SW abstraction from Ballyshunnock impoundment and new WTP.	The desktop assessments undertaken indicate that the abstraction cannot increase due to WFD allowable abstraction limits and other constraints such as water quality issues. Therefore, there is no scope to increase abstraction.
SAK-527	New SW abstraction from Knockaderry impoundment and new WTP to supply deficit.	As per Local Authority information this reservoir is out of use, therefore not an option. Screened out due to resilience and sustainability issues.
SAK-561	New SW abstraction from Clodiagh River and new WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-602	Increase SW abstraction from Mahon River and upgrade Ballylaneen WTP to supply spare capacity to neighbouring WRZ in deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-621	Increase existing GW abstraction and upgrade Carrignagower WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAK-627	Rationalise Ballysaggart / Carrignagower to Lismore / Cappoquin / Ballyduff (LCB) WRZ [new SW abstraction	Abstracting the volume of water required is considered unfeasible.

	from Blackwater River and new WTP].	
SAK-761	New SW abstraction from Aherlow river and upgrade Rossadrehid WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAK-762	Interconnect Tipperary Town and Galtee Regional and supply deficit from Galtee Regional.	Abstracting the volume of water required is considered unfeasible.

4.2.3 Preferred Approach for SAK

Full details of the Preferred Approach (and how it was reached) are included in the SAK Technical Report in Appendix 1 of the RWRP-SE. The final Preferred Approach for SAK is shown in Table 4.4 below. The findings of the Preferred Approach Development for SAK Waterford and South Tipperary at WRZ level, include the following:

- There are seven options that score a 0 in relation to potential impact on a designated European site.
- There are nine -3 scores against designated European sites within the Preferred Approach; options SAK-077, SAK-120, SAK-211 and SAK-618 (in-combination with SAK-560), and Group options SAK-853, SAK-949, SAK-973, SAK-983 and SAK-985c.
- The remaining options within the Preferred Approach have either a -1 or a -2 score against European sites.

In summary, the Preferred Approach for SAK is the Combination 3 approach which consists of local WRZ supplies solutions for Anglesboro Water Supply, South Kilkenny, Piltown-Fiddown, Callan PWS, Templemore/Templetuohy, Galtee Regional, Tipperary Town Supply, Burncourt Ballylooby, Ballynoe/ Melleray, Deelish/Ballinacourty/Kilnafrehan, Ardmore, Carrowgarriff, Ballymacarbry, Boolavoonteen/ Kilcooney/Touraneena, Adramone/Kilrossanty, Ballyguiry, Inchinleamy, Modeligo, Liskealty, Ballyshunnock, Kilbrien, Garryahylish, Smoore, Carrigeen, Portlaw, Lyrenaleara, and Ardmore Grange WRZs, primarily driven by the small scale of the supplies and difficulties in transporting small volumes of water over long distances.

Proposed solutions for Carrick-On-Suir are a new groundwater abstraction and rationalisation of Rathgormack, Ballyknock, Crehanagh and Garravoone WRZs. It is proposed to interconnect Coalbrook/ Commons and Fethard & Mullenbawn WRZs. Rationalise Graiguenageeha to Stradbally WRZ. Rationalise Lacken, and Moores Well, Monatarrif, Carrignagower and Ballysaggart to Lismore/ Cappoquin/Ballyduff (LCB) WRZ. Rationalise Horse & Jockey, Littleton, Glengar and Two Mile Borris to Thurles and interconnect with Dundrum Regional. The Preferred Approach for Clonmel involves a new abstraction from River Suir and new WTP, interconnection with Templetney/Brackford Bridge and Ardfinnan Regional, and rationalisation of Russelstown, Kilmanahan, Tullohea, Kilcash, Ahenny and Ballinvir, Glenagad and Poulavanogue WRZs. The Preferred Approach for Carrigmore, Kilteely, Herbertstown, Knocklong/Hospital, Ballylanders and Galbally is rationalisation to Limerick City WRZ. The preferred approach for Graiguenageeha and Stradbally is rationalisation to Dungarvan WRZ. Finally, the Preferred Approach for East Waterford Water Supply Scheme involves a new surface water abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at

Adamstown WTP to supply deficit. Rationalise Ballyogarty, Kilmacthomas, Faha, Smoore, Fews, Kill/Ballylaneen, Scrahan, Dunhill - Cois Coille and Dunhill Ballinageeragh to East Waterford WRZ.

Delivery of the Preferred Approach will secure all of the supplies in the area in terms of Quality, Quantity, Sustainability and Resilience. The Preferred Approach for SAK Waterford and South Tipperary also includes for demand side (**Lose Less** and **Use Less**) measures, including:

- Ongoing leakage management including active leakage control, pressure management and find and fix activities to offset Natural Rate of Leakage Rise (NRR).
- Nett leakage reduction in Fethard & Mullenbawn Regional Public Water Supply, Galtee Regional and Tipperary Town Supply Water Resource Zones, amounting to 0.347Ml/d (applied to SDB Deficit) to move towards achieving the National SELL Target by 2034.
- Continuation of Uisce Éireann household and business water conservation campaigns, initiatives and education programmes.
- The option to implement legally enforceable Water Conservation Orders in drought periods in order to protect the environment and our public water supplies.

The Preferred Approach provides benefits for the environment and European sites through decommissioning the existing abstraction at Carrignagower WTP which currently extracts from the Blackwater River (Cork/Waterford) SAC.

All of the options that make up the Preferred Approach and assessed as part of this NIS are listed in Table 4.4 and shown in Figure 4.3.

Table 4.4 - Final Preferred Approach for SAK – Options

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAK-055 1900SC0026 Anglesboro Water Supply	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ not in deficit. WTP upgrade works only • WRZ current WAFU DYCP 2044 = 0.046Ml/d, DYCP 2044 demand = 0.019Ml/d so surplus of 0.027Ml/d • Existing GW abstraction maintained • Existing GW source (Knockaskallen GWB) WFD status 2016-2021 – Good
SAK-648 1500SC0001 South Kilkenny Environs	-1	**Bring back Silverspring WTP to production and supply deficit** • WRZ in deficit. Recommission Silverspring WTP and abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 9.789Ml/d, DYCP 2044 demand = 10.192Ml/d so additional 0.403Ml/d required to meet WRZ deficit • Existing GW abstraction recommissioned • Existing GW abstraction (Clonmel GWB) WFD status 2016-2021 – Good
SAK-073 1500SC0019 Piltown-Fiddown	-1	**New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL)** • New GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.379Ml/d, DYCP 2044 demand = 1.567Ml/d so additional 1.188Ml/d required to meet WRZ deficit • New GW abstraction (Carrick-on-Suir GWB) WFD status 2016-2021 - Good
SAK-077 1500SC0005 Callan PWS	-3	**Increase GW abstraction from existing spring and BH and upgrade Callan WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.99Ml/d, DYCP 2044 demand = 1.501Ml/d so additional 0.511Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW abstraction (Clifden Northwest GWB) WFD status 2016-2021 - Good
SAK-106 2900SC0042	-1	**Rationalise Templetuohy to Templemore [rationalise to College Hill WTP]. Rationalisation within WRZ**

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
Templemore/Templetuohy		• WRZ in deficit. Rationalise Templetuohy to Templemore and increase GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 2.536Ml/d, DYCP 2044 demand = 2.998Ml/d so additional 0.462Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW abstraction (Templemore GWB) WFD status 2016-2021 - Good
SAK-120 2900SC0032 Galtee Regional	-3	**New SW abstraction from Aherlow river and upgrade Rossadrehid WTP, Thomas Augmentation WTP, Springmount Source WTP and Farranamnagh WTP for water quality and to supply deficit** • WRZ in deficit. New SW abstraction to supply future deficit • WRZ current WAFU DYCP 2044 = 6.72Ml/d, DYCP 2044 demand = 12.819Ml/d so additional 6.099Ml/d required to meet WRZ deficit • New SW abstraction (Aherlow SWB) WFD status 2016-2021 - Good
SAK-180 2900SC0049 Tipperary Town Supply	-1	**New GW abstraction, new WTP to supply deficit and upgrade of Fawnagown WTP for water quality purposes** • WRZ in deficit. New GW abstraction to supply future deficit • WRZ current WAFU DYCP 2044 = 2.292Ml/d, DYCP 2044 demand = 3.591Ml/d so additional 1.299Ml/d required to meet WRZ deficit • New GW abstraction (Tipperary GWB) WFD status 2016-2021 - Good
SAK-211 2900SC0023 Burncourt Ballylooby	-3	**Increase GW abstraction from two BHs and upgrade Ballylooby Springs WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to supply future deficit • WRZ current WAFU DYCP 2044 = 2.52Ml/d, DYCP 2044 demand = 3.853Ml/d so additional 1.333Ml/d required to meet WRZ deficit • Existing GW abstraction (Clonmel GWB) WFD status 2016-2021 - Good
SAK-386 3100SC0077 Ballynoe/Melleray	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in projected surplus • WRZ current WAFU DYCP 2044 = 0.6Ml/d, DYCP 2044 demand = 0.082Ml/d so surplus of 0.517Ml/d • Existing GW abstraction maintained

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
		• Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 - Good
SAK-387 3100SC0111 Deelish/Ballinacourty	-2	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in projected surplus • WRZ current WAFU DYCP 2044 = 0.417Ml/d, DYCP 2044 demand = 0.274Ml/d so surplus of 0.143Ml/d • Existing SW abstraction maintained • Existing SW abstraction (Deelish Reservoir) WFD status 2016-2021 - Moderate
SAK-392 3100SC0005 Ardmore	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in projected surplus • WRZ current WAFU DYCP 2044 = 0.706Ml/d, DYCP 2044 demand = 0.466Ml/d so surplus of 0.24Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Helvick Head GWB) WFD status 2016-2021 - Good
SAK-416 3100SC0030 Carrowgarriff	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in projected surplus • WRZ current WAFU DYCP 2044 = 0.182Ml/d, DYCP 2044 demand = 0.02Ml/d so surplus of 0.162Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 - Good
SAK-441 3100SC0054 Ballymacarbry	-2	**New GW abstraction (karstic) and new WTP to supply deficit** • WRZ in deficit. New GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.299Ml/d, DYCP 2044 demand = 0.294Ml/d so additional 0.065Ml/d required to meet WRZ deficit • New GW abstraction (Comeragh GWB) WFD status 2016-2021 - Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAK-444 3100SC0027 Boolavoonteen/ Kilcooney/ Touraneena	-1	**Increase GW abstraction from Tooraneena BH and upgrade Touraneena WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.128Ml/d, DYCP 2044 demand = 0.191Ml/d so additional 0.062Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 - Good
SAK-450 3100SC0079 Adramone / Kilrossanty	-1	**Increase GW abstraction from Kilrossanty BH and upgrade Kilrossanty WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.114Ml/d, DYCP 2044 demand = 0.173Ml/d so additional 0.06Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW abstraction (Tramore GWB) WFD status 2016-2021 - Good
SAK-783 **(Part of Grouped Option SAK-995)** 3100SC0001 Dungarvan	-2	**Increase GW abstraction from four BH and upgrade Ballinamuck WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 6.638Ml/d, DYCP 2044 demand = 8.549Ml/d so additional 1.911Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW abstraction (Dungarvan GWB) WFD status 2016-2021 - Good
SAK-472 3100SC0051 Ballyguiry	-1	**Increase GW abstraction from Ballyguiry BH and upgrade Ballyguiry WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.037Ml/d, DYCP 2044 demand = 0.074Ml/d so additional 0.037Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW abstraction (Helvick Head GWB) WFD status 2016-2021 - Good
SAK-476 **(Part of Grouped Option SAJ-614)**	-2	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ not in deficit. WTP upgrade works only • WRZ current WAFU DYCP 2044 = 0.055Ml/d, DYCP 2044 demand = 0.024Ml/d so surplus of 0.03Ml/d

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
3100SC0053 Inchinleamy		• Existing GW abstraction maintained • Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 - Good
SAK-477 3100SC0112 Modeligo	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in surplus, WTP upgrade works only • WRZ current WAFU DYCP 2044 = 0.11Ml/d, DYCP 2044 demand = 0.08Ml/d so surplus of 0.03Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 - Good
SAK-478 3100SC0114 Liskealty	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in surplus, WTP upgrade works only • WRZ current WAFU DYCP 2044 = 0.04Ml/d, DYCP 2044 demand = 0.012Ml/d so surplus of 0.029Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Helvick Head GWB) WFD status 2016-2021 - Good
SAK-481 3100SC0098 Ballyshunnock	0	**Increase GW abstraction from BH and Ballyshunnock WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.028Ml/d, DYCP 2044 demand = 0.044Ml/d so additional 0.016Ml/d required to meet WRZ deficit • Existing GW abstraction (Waterford GWB) WFD status 2016-2021 - Good
SAK-509 3100SC0116 Kilbrien	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in surplus, WTP upgrade works only • WRZ current WAFU DYCP 2044 = 0.055Ml/d, DYCP 2044 demand = 0.049Ml/d so surplus of 0.006Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Kilrion GWB) WFD status 2016-2021 - Good
SAK-525 3100SC0044 Garryahylish	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in surplus, WTP upgrade works only • WRZ current WAFU DYCP 2044 = 0.006Ml/d, DYCP 2044 demand = 0.001Ml/d so surplus of 0.004Ml/d • Existing GW abstraction maintained

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
		• Existing GW abstraction (Tramore GWB) WFD status 2016-2021 - Good
SAK-530 **(Part of Grouped Option SAK-949)** 3100SC0035 Smoore	-3	**Rationalise Smoore to East Waterford WRZ [new SW abstraction from River Suir]** • Smoore WRZ in deficit and WRZ is to be rationalised to East Waterford WRZ • WRZ current WAFU DYCP 2044 = 0.018Ml/d, DYCP 2044 demand = 0.022Ml/d so additional 0.004Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Waterford GWB) WFD status 2016-2021 - Good
SAK-548 3100SC0123 Carrigeen	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in surplus, WTP upgrade works only • WRZ current WAFU DYCP 2044 = 0.037Ml/d, DYCP 2044 demand = 0.009Ml/d so surplus of 0.027Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Waterford GWB) WFD status 2016-2021 - Good
SAK-560 & SAK-618 3100SC0124 Portlaw	-2 & -3	**Increase GW abstraction from Portlaw BH and Portlaw spring and upgrade Portlaw WTP to partly supply deficit. New GW abstraction and new WTP to partly supply deficit** • WRZ in deficit. New GW abstraction & new WTP, and increase existing GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.288Ml/d, DYCP 2044 demand = 0.693Ml/d so additional 0.405Ml/d required to meet WRZ deficit • Existing GW abstraction (Waterford GWB) WFD status 2016-2021 - Good • New GW abstraction (Clonmel GWB) WFD status 2016-2021 - Good
SAK-569 3100SC0120 Lyrenaleara	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in surplus, WTP upgrade works only • WRZ current WAFU DYCP 2044 = 0.037Ml/d, DYCP 2044 demand = 0.027MJl/d so surplus of 0.01Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Comeragh GWB) WFD status 2016-2021 - Good
SAK-604	-3	**Rationalise Kill/Ballylaneen to East Waterford WRZ [new SW abstraction from River Suir]**

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
(Part of Grouped Option SAK-949) 3100SC0102 Kill/Ballylaneen		• Kill/Ballylaneen WRZ in surplus but WRZ to be rationalised to East Waterford WRZ • WRZ current WAFU DYCP 2044 = 0.458Ml/d, DYCP 2044 demand = 0.402Ml/d so surplus of 0.056Ml/d • Existing SW abstraction to be decommissioned • Existing SW abstraction (Mahon RWB) WFD status 2016-2021 - Poor
SAK-625 3100SC0115 Ardmore Grange	0	**Increase GW abstraction and upgrade WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.138Ml/d, DYCP 2044 demand = 0.254Ml/d so additional 0.116Ml/d required to meet WRZ deficit • Existing GW abstraction (Glenville GWB) WFD status 2016-2021 - Good
SAK-289 **(Part of Grouped Option SAK-837)** 2900SC0024 Carrick-On-Suir	-2	**New GW abstraction and new Linguan WTP to supply deficit** • WRZ in deficit. Mew GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 1.607Ml/d, DYCP 2044 demand = 3.064Ml/d so additional 1.457Ml/d required to meet WRZ deficit • New GW abstraction (Clonmel GWB) WFD status 2016-2021 - Good
SAK-265 **(Part of Grouped Option SAK-837)** 3100SC0089 Rathgormack	-2	**Rationalise Rathgormack to Carrick on Suir WRZ [Linguan WTP]** • WRZ not in deficit, however WTP to be rationalised to Carrick-on-Suir WRZ • WRZ current WAFU DYCP 2044 = 0.204Ml/d, DYCP 2044 demand = 0.16Ml/d so surplus of 0.044Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Comeragh GWB) WFD status 2016-2021 - Good
SAK-269 **(Part of Grouped Option SAK-837)** 3100SC0107	-2	**Rationalise Ballyknock to Carrick-on-Suir WRZ [Linguan WTP]** • WRZ in deficit, however WTP to be rationalised to Carrick-on-Suir WRZ • WRZ current WAFU DYCP 2044 = 0.004Ml/d, DYCP 2044 demand = 0.015Ml/d so additional 0.011Ml/d required to meet WRZ deficit • Existing GW abstraction maintained

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
Ballyknock		• Existing GW abstraction (Comeragh GWB) WFD status 2016-2021 - Good
SAK-271 **(Part of Grouped Option SAK-837)** 3100SC0110 Crehanagh	-2	**Rationalise Crehanagh to Carrick-on-Suir WRZ [Linguan WTP]** • WRZ in deficit, however WTP to be rationalised to Carrick-on-Suir WRZ • WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.019Ml/d so additional 0.01Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Comeragh GWB) WFD status 2016-2021 - Good
SAK-273 **(Part of Grouped Option SAK-837)** 3100SC0108 Garravoone	-2	**Rationalise Garravoone to Carrick on Suir WRZ [Linguan WTP]** • Garravoone WRZ not in deficit, however WTP to be rationalised to Carrick-on-Suir WRZ • WRZ current WAFU DYCP 2044 = 0.083Ml/d, DYCP 2044 demand = 0.045Ml/d so surplus of 0.037Ml/d • Existing GW abstraction to be decommissioned • Existing GW abstraction (Comeragh GWB) WFD status 2016-2021 - Good
SAK-222 **(Part of Grouped Option SAK-853)** 2900SC0026 Fethard & Mullenbawn Regional Public Water Supply	-3	**Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighbouring WRZ in deficit** • Fethard & Mullenbawn Regional Public Water Supply not in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 8.521Ml/d, DYCP 2044 demand = 8.304Ml/d so surplus of 0.218Ml/d • Existing GW abstraction (Comeragh GWB) WFD status 2016-2021 - Good
SAK-239 **(Part of Grouped Option SAK-853)** 2900SC0067 Coalbrook/Commons	-3	**Interconnect Coalbrook/Commons and Fethard & Mullenbawn and supply deficit from Fethard & Mullenbawn [Mullinbawn WTP]** • WRZ in deficit. Interconnect with Fethard & Mullenbawn Regional Public Water Supply WRZ to supply future deficit • WRZ current WAFU DYCP 2044 = 1.043Ml/d, DYCP 2044 demand = 1.652Ml/d so additional 0.609Ml/d required to meet WRZ deficit • Existing GW abstraction maintained

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
		• Existing GW abstractions (Silveardagh Hills GWB) WFD status 2016-2021 – Good and (Ballingarry GWB) WFD status 2016-2021 – Good
SAK-784 **(Part of Grouped Option SAK-995)** 3100SC0083 Stradbally	-2	**Rationalise Stradbally to Dungarvan WRZ** • Stradbally WRZ in projected surplus • WRZ current WAFU DYCP 2044 = 0.55Ml/d, DYCP 2044 demand = 0.372Ml/d so surplus of 0.178Ml/d • Existing SW abstraction to be decommissioned • Existing SW abstraction (Tay SWB) WFD status 2016-2021 – Good
SAK-785 **(Part of Grouped Option SAK-995)** 3100SC0093 Graiguenageeha	-2	**Rationalise Graiguenageeha to Dungarvan WRZ** • WRZ in deficit and is to be rationalised to Dungarvan WRZ • WRZ current WAFU DYCP 2044 = 0.014Ml/d, DYCP 2044 demand = 0.024Ml/d so additional 0.01Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing SW abstraction (Tramore GWB) WFD status 2016-2021 – Good
SAK-608 **(Part of Grouped Option SAK-949)** 3100SC0101 Scrahan	-3	**Rationalise Scrahan to East Waterford WRZ [new SW abstraction from River Suir]** • Scrahan WRZ not in deficit however WTP to be rationalised to East Waterford WRZ • WRZ current WAFU DYCP 2044 = 0.3Ml/d, DYCP 2044 demand = 0.284Ml/d so surplus of 0.016Ml/d • Existing GW abstraction to be decommissioned • Existing GW abstraction (Tramore GWB) WFD status 2016-2021 – Good
SAK-399 **(Part of Grouped Option SAK-949)** 3100SC0097 Ballyogarty	-3	**Rationalise Ballyogarty to East Waterford WRZ [new SW abstraction from River Suir]** • WRZ in deficit. WRZ to be rationalised to East Waterford WRZ • WRZ current WAFU DYCP 2044 = 0.156Ml/d, DYCP 2044 demand = 0.367Ml/d so additional 0.211Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Tramore GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAK-438 **(Part of Grouped Option SAK-949)** 3100SC0099 Kilmacthomas	-3	**Rationalise Kilmacthomas to East Waterford WRZ [new SW abstraction from River Suir]** • WRZ in deficit. Rationalise Kilmacthomas WRZ to East Waterford WRZ • WRZ current WAFU DYCP 2044 = 0.165Ml/d, DYCP 2044 demand = 0.246Ml/d so additional 0.081Ml/d required to meet WRZ deficit • Existing abstractions to be decommissioned • Existing GW abstraction (Tramore GWB) WFD status 2016-2021 – Good
SAK-501 **(Part of Grouped Option SAK-949)** 3100SC0042 Faha	-3	**Rationalise Faha to East Waterford WRZ [new SW abstraction from River Suir]** • WRZ in deficit and WRZ is to be rationalised to East Waterford WRZ • WRZ current WAFU DYCP 2044 = 0.011Ml/d, DYCP 2044 demand = 0.014Ml/d so additional 0.003Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Tramore GWB) WFD status 2016-2021– Good
SAK-555 **(Part of Grouped Option SAK-949)** 3100SC0045 Fews	-3	**Rationalise Fews to East Waterford WRZ [new SW abstraction from River Suir]** • WRZ in deficit. WRZ to be rationalised to East Waterford WRZ • WRZ current WAFU DYCP 2044 = 0.06Ml/d, DYCP 2044 demand = 0.07Ml/d so additional 0.01Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Tramore GWB) WFD status 2016-2021 – Good
SAK-675 & SAK-756 **(Part of Grouped Option SAK-973)** 3100SC0095 Lismore/Cappoquin/Ballyduff (LCB)	-3	**Increase GW (to include commissioning new TW) abstraction from existing BH and upgrade LCB Lismore Deerpark WTP to supply deficit. New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit** • WRZ in deficit. Increase existing GW abstraction and new GW abstraction to supply future deficit • WRZ current WAFU DYCP 2044 = 1.546Ml/d, DYCP 2044 demand = 2.624Ml/d so additional 1.077Ml/d required to meet WRZ deficit • Existing GW abstractions (Lismore GWB) WFD status 2016-2021 – Good
SAK-677	-3	**Rationalise Lacken and Moores Well to Lismore/Cappoquin/Ballyduff (LCB) WRZ [Deerpark WTP]**

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
(Part of Grouped Option SAK-973) 3100SC0081 Moores Well		• WRZ in deficit and WTP is to be rationalised to LCB WRZ • WRZ current WAFU DYCP 2044 = 0.068Ml/d, DYCP 2044 demand = 0.134Ml/d so additional 0.066Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 – Good
SAK-672 **(Part of Grouped Option SAK-973)** 3100SC0024 Ballysaggart	-3	**Rationalise Ballysaggart, Monatariff and Carrognagower to Lismore/Cappoquin/Ballyduff (LCB) [Deerpark WTP]** • Ballysaggart WRZ not in deficit however WTP to be rationalised to Lismore/Cappoquin/Ballyduff (LCB) WRZ • WRZ current WAFU DYCP 2044 = 0.152Ml/d, DYCP 2044 demand = 0.019Ml/d so surplus of 0.134Ml/d • Existing GW abstraction to be decommissioned • Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 – Good
SAK-676 **(Part of Grouped Option SAK-973)** 3100SC0113 Lacken	-3	**Rationalise Lacken and Moores Well to Lismore/Cappoquin/Ballyduff (LCB) WRZ [Deerpark WTP]** • WRZ in deficit and WTP to be rationalised to Lismore Cappoquin/Ballyduff (LCB) WRZ • WRZ current WAFU DYCP 2044 = 0.033Ml/d, DYCP 2044 demand = 0.039Ml/d so additional 0.006Ml/d required to meet WRZ deficit • Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 – Good
SAK-673 **(Part of Grouped Option SAK-973)** 3100SC0126 Monatarrif	-3	**Rationalise Ballysaggart, Monatariff and Carrognagower to Lismore/Cappoquin/Ballyduff (LCB) [Deerpark WTP]** • WRZ in deficit and WTP to be rationalised to Lismore/Cappoquin/Ballyduff (LCB) WRZ • WRZ current WAFU DYCP 2044 = 0.019Ml/d, DYCP 2044 demand = 0.043Ml/d so additional 0.024Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 – Good
SAK-674	-3	**Rationalise Ballysaggart, Monatariff and Carrognagower to Lismore/Cappoquin/Ballyduff (LCB) [Deerpark WTP]**

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
(Part of Grouped Option SAK-973) 3100SC0127 Carrignagower		• WRZ in deficit and WTP to be rationalised to Lismore/Cappoquin/Ballyduff (LCB) WRZ • WRZ current WAFU DYCP 2044 = 0.037Ml/d, DYCP 2044 demand = 0.055Ml/d so additional 0.018Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Knockmealdown GWB) WFD status 2016-2021 – Good
SAK-687 **(Part of Grouped Option SAK-975)** 2900SC0009 Two Mile Borris	-2	**Rationalise Two Mile Borris to Thurles WRZ** • WRZ in deficit and WTP to be rationalised to Thurles WRZ • WRZ current WAFU DYCP 2044 = 0.303Ml/d, DYCP 2044 demand = 0.347Ml/d so additional 0.044Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Templemore GWB) WFD status 2016-2021 – Good
SAK-684 **(Part of Grouped Option SAK-975)** 2900SC0013 Horse & Jockey PWS	-2	**Rationalise Horse and Jockey to Thurles WRZ** • Horse & Jockey WRZ not in deficit however WTP to be rationalised to Thurles WRZ • WRZ current WAFU DYCP 2044 = 0.3Ml/d, DYCP 2044 demand = 0.252Ml/d so surplus of 0.048Ml/d • Existing GW abstraction (Templemore GWB) WFD status 2016-2021 – Good
SAK-688 **(Part of Grouped Option SAK-975)** 2900SC0014 Thurles/Borrisoleigh	-2	**Supply spare capacity to neighbouring WRZs in deficit** • WRZ in projected surplus • WRZ current WAFU DYCP 2044 = 11.676Ml/d, DYCP 2044 demand = 6.588Ml/d so surplus of 5.087Ml/d • Existing GW and SW abstractions to be maintained • Existing GW abstraction (Templemore GWB) WFD status 2016-2021 – Good • Existing SW abstraction (Clodiagh (Tipperary) RWB) WFD status 2016-2021 – Good
SAK-685 **(Part of Grouped Option SAK-975)**	-2	**Rationalise Littleton to Thurles WRZ** • Littleton PWS not in deficit, however WTP to be rationalised to Thurles/Borrisoleigh WRZ • WRZ current WAFU DYCP 2044 = 0.238Ml/d, DYCP 2044 demand = 0.205Ml/d so surplus of 0.033Ml/d • Existing GW to be decommissioned

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
2900SC0016 Littleton PWS		• Existing GW abstraction (Templemore GWB) WFD status 2016-2021 – Good
SAK-686 **(Part of Grouped Option SAK-975)** 2900SC0029 Dundrum Regional	-2	**Interconnect Dundrum Regional and Thurles and supply deficit from Thurles** • WRZ in deficit and is to be interconnected to to Thurles/Borrisoleigh WRZ • WRZ current WAFU DYCP 2044 = 4.684Ml/d, DYCP 2044 demand = 8.8Ml/d so additional 4.116Ml/d required to meet WRZ deficit • Existing GW and SW abstractions to be maintained • Existing GW abstraction (Templemore GWB) WFD status 2016-2021 – Good • Existing SW abstraction (Multeen (East) RWB) WFD status 2016-2021 – Good
SAK-689 **(Part of Grouped Option SAK-975)** 2900SC0069 Glengar	-2	**Rationalise Glengar to Dundrum regional WRZ** • WRZ in deficit. WTP to be rationalised to Thurles/Borrisoleigh WRZ • WRZ current WAFU DYCP 2044 = 0.284Ml/d, DYCP 2044 demand = 0.362Ml/d so additional 0.077Ml/d required to meet WRZ deficit • Existing abstraction to be decommissioned • Existing GW abstraction (Slieve Phelim GWB) WFD status 2016-2021 – Good
SAK-734 **(Part of Grouped Option SAK-983)** 2900SC0025 Clonmel & Environs	-3	**New abstraction from the River Suir and new WTP at Barnes (site identified)** • WRZ in deficit. New SW abstraction to supply future deficit • WRZ current WAFU DYCP 2044 = 4.256Ml/d, DYCP 2044 demand = 11.486Ml/d so additional 7.23Ml/d required to meet WRZ deficit • Existing GW abstraction (Clonmel GWB) WFD status 2016-2021 – Good • Existing SW abstractions (Suir RWB) WFD status 2016 – Good and (Glasha (Waterford) RWB) WFD status 2016-2021 – High and (Glenary RWB) WFD status 2016-2021 Good • New SW abstraction (Suir RWB) WFD status 2016-2021- Good
SAK-735 **(Part of Grouped Option SAK-983)**	-3	**Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel [new SW abstraction from River Suir]** • WRZ in deficit. Interconnect with Clonmel WRZ to supply future deficit

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
2900SC0021 Ardfinnan Regional		• WRZ current WAFU DYCP 2044 = 1.139Ml/d, DYCP 2044 demand = 7.415Ml/d so additional 6.276Ml/d required to meet WRZ deficit • Existing SW abstraction (Glengalla SWB) WFD status 2016-2021 – Good
SAK-733 **(Part of Grouped Option SAK-983)** 2900SC0039 Templetney/Brackford Bridge PWS	-3	**Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir)** • WRZ in deficit and is to be interconnected with Clonmel WRZ • WRZ current WAFU DYCP 2044 = 3.3Ml/d, DYCP 2044 demand = 4.549Ml/d so additional 1.249Ml/d required to meet WRZ deficit • Existing GW abstractions maintained • Existing GW abstraction (Clonmel GWB) WFD status 2016-2021 – Good
SAK-738 **(Part of Grouped Option SAK-983)** 2900SC0020 Ahenny	-3	**Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ [River Suir]** • Ahenny WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ • WRZ current WAFU DYCP 2044 = 0.132Ml/d, DYCP 2044 demand = 0.058Ml/d so surplus of 0.074Ml/d • Existing GW abstraction to be decommissioned • Existing GW abstraction (Clonmel GWB) WFD status 2016-2021 – Good
SAK-736 **(Part of Grouped Option SAK-983)** 2900SC0031 Tullohea	-3	**Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ [River Suir]** • WRZ in deficit and the WTP is to be rationalised to Clonmel WRZ • WRZ current WAFU DYCP 2044 = 0.303Ml/d, DYCP 2044 demand = 0.356Ml/d so additional 0.053Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Mullinavat GWB) WFD status 2016-2021 – Good
SAK-739 **(Part of Grouped Option SAK-983)** 2900SC0022	-3	**Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ [River Suir]** • Ballinvir WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ • WRZ current WAFU DYCP 2044 = 0.066Ml/d, DYCP 2044 demand = 0.041Ml/d so surplus of 0.026Ml/d • Existing GW abstraction to be decommissioned • Existing GW abstraction (Mullinavat GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
Ballinvir		
SAK-737 **(Part of Grouped Option SAK-983)** 2900SC0036 Kilcash	-3	**Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ [River Suir]** • WRZ in deficit and WTP to be rationalised to Clonmel WRZ • WRZ current WAFU DYCP 2044 = 0.06Ml/d, DYCP 2044 demand = 0.075Ml/d so additional 0.016Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Carrick-on-Suir GWB) WFD status 2016-2021 – Good
SAK-740 **(Part of Grouped Option SAK-983)** 3100SC0118 Russelstown	-3	**Rationalise Russelstown to Clonmel WRZ** • Russelstown WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ • WRZ current WAFU DYCP 2044 = 0.041Ml/d, DYCP 2044 demand = 0.039Ml/d so surplus of 0.003Ml/d • Existing GW abstraction to be decommissioned • Existing GW abstraction (Carrick-on-Suir GWB) WFD status 2016-2021 – Good
SAK-742 **(Part of Grouped Option SAK-983)** 3100SC0087 Glenagad	-3	**Rationalise Glennagad to Clonmel WRZ [new abstraction from the River Suir and new WTP at Barnes site]** • Glenagad WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ • WRZ current WAFU DYCP 2044 = 0.037Ml/d, DYCP 2044 demand = 0.025Ml/d so surplus of 0.012Ml/d • Existing GW abstraction to be decommissioned • Existing GW abstraction (Comeragh GWB) WFD status 2016-2021 – Good
SAK-741 **(Part of Grouped Option SAK-983)** 3100SC0129 Kilmanahan	-3	**Rationalise Kilmanahan to Clonmel WRZ** • Kilmanahan WRZ not in deficit, however WTP to be rationalised to Clonmel WRZ • WRZ current WAFU DYCP 2044 = 0.019Ml/d, DYCP 2044 demand = 0.016Ml/d so surplus of 0.003Ml/d • Existing GW abstraction to be decommissioned • Existing GW abstraction (Carrick-on-Suir GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAK-743 **(Part of Grouped Option SAK-983)** 3100SC0119 Poulavanogue (Waterford)	-3	**Rationalise Poulavanogue (Waterford) to Clonmel WRZ [new abstraction from the River Suir and new WTP at Barnes site]** • WRZ in deficit • WRZ current WAFU DYCP 2044 = 0.013Ml/d, DYCP 2044 demand = 0.082Ml/d so additional 0.069Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Carrick-on-Suir GWB) WFD status 2016-2021 – Good
SAK-749 **(Part of Grouped Option SAK-985c)** 1900SC0030 Kilteely	-3	**Rationalise Kilteely to Limerick City [Clareville WTP] WRZ** • WRZ in deficit and WTP to be rationalised to Clareville WTP • WRZ current WAFU DYCP 2044 = 0.257Ml/d, DYCP 2044 demand = 0.37Ml/d so additional 0.113Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Knockroe Southwest GWB) WFD status 2016-2021 – Good
SAK-750 **(Part of Grouped Option SAK-985c)** 1900SC0008 Herbertstown	-3	**Rationalise Herbertstown to Limerick City [Clareville WTP] WRZ** • WRZ in deficit and WTP to be rationalised to Clareville WTP • WRZ current WAFU DYCP 2044 = 0.275Ml/d, DYCP 2044 demand = 0.314Ml/d so additional 0.039Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Herbertstown GWB) WFD status 2016-2021 – Good
SAK-751 **(Part of Grouped Option SAK-985c)** 1900SC0010 Knocklong/Hospital	-3	**Rationalise Knocklong/Hospital to Limerick City (Clareville WTP)** • WRZ in deficit and WTP to be rationalised to Clareville WTP • WRZ current WAFU DYCP 2044 = 1.357Ml/d, DYCP 2044 demand = 1.475Ml/d so additional 0.119Ml/d required to meet WRZ deficit • Existing GW abstractions to be decommissioned • Existing GW abstraction (Herbertstown GWB) WFD status 2016-2021 – Good and (Hospital GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAK-753 **(Part of Grouped Option SAK-985c)** 1900SC0011 Galbally Water Supply	-3	**Rationalise Galbally to Limerick City (Clareville WTP)** • WRZ in deficit and WTP to be rationalised to Clareville WTP • WRZ current WAFU DYCP 2044 = 0.183Ml/d, DYCP 2044 demand = 0.283Ml/d so additional 0.099Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Bansha GWB) WFD status 2016-2021 – Good
SAK-752 **(Part of Grouped Option SAK-985c)** 1900SC0012 Ballylanders Water Supply	-3	**Rationalise Ballylanders to Limerick City (Clareville WTP)** • WRZ in deficit and WTP to be rationalised to Clareville WTP • WRZ current WAFU DYCP 2044 = 0.229Ml/d, DYCP 2044 demand = 0.436Ml/d so additional 0.207Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Knockaskallen GWB) WFD status 2016-2021 – Good
SAK-748 **(Part of Grouped Option SAK-985c)** 1900SC0038 Carrigmore	-3	**Rationalise Carrigmore to Limerick City (Clareville WTP)** • WRZ in deficit and WTP to be rationalised to Clareville WTP • WRZ current WAFU DYCP 2044 = 0.092Ml/d, DYCP 2044 demand = 0.278Ml/d so additional 0.186Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Slieve Phelim GWB) WFD status 2016-2021 – Good
SAK-356 **(Part of Grouped Option SAK-949)** 3100SC0033 East Waterford Water Supply Scheme	-3	**New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit** • WRZ in deficit. New GW abstraction to supply the future deficit • WRZ current WAFU DYCP 2044 = 35.211Ml/d, DYCP 2044 demand = 42.153Ml/d so additional 6.942Ml/d required to meet WRZ deficit • Existing SW abstractions retained • Existing SW abstractions (Mahon RWB) WFD 2016-2021 – Poor, (Ballyshunnock LWB) 2016-2021 – Poor and (Clodiagh (Portlaw) RWB) WFD 2016-2021 – Good • New SW abstraction (Suir RWB) WFD status 2016-2021– Moderate

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAK-495 **(Part of Grouped Option SAK-949)** 3100SC0091 Dunhill - Cois Coille	-3	**Rationalise Dunhill - Cois Coille to East Waterford WRZ [new SW abstraction from River Suir]** • Dunhill - Cois Coille WRZ in deficit and WRZ is to be rationalised to East Waterford WRZ • WRZ current WAFU DYCP 2044 = 0.019Ml/d, DYCP 2044 demand = 0.034Ml/d so additional 0.015Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Tramore GWB) WFD status 2016-2021– Good
SAK-538 **(Part of Grouped Option SAK-949)** 3100SC0092 Dunhill Ballinageeragh	-3	**Rationalise Dunhill Ballinageeragh to East Waterford WRZ [new SW abstraction from River Suir]** • Dunhill Ballinageeragh WRZ in deficit and WRZ is to be rationalised to East Waterford WRZ • WRZ current WAFU DYCP 2044 = 0.011Ml/d, DYCP 2044 demand = 0.014Ml/d so additional 0.003Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Tramore GWB) WFD status 2016-2021– Good

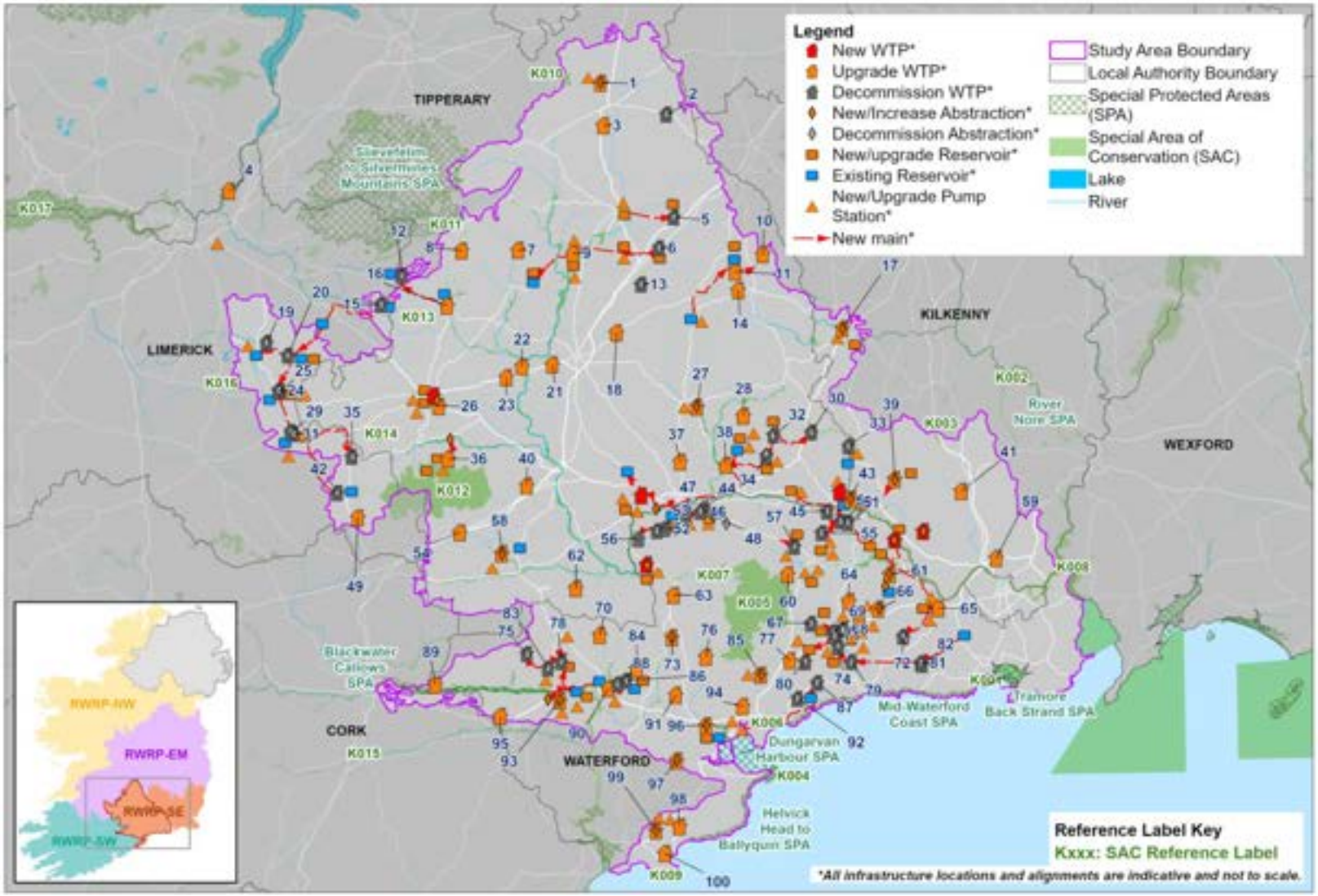

Figure 4.3 - Study Area K – Preferred Approach and European sites within SAK boundary. See Table 4.2 for list of WTPs and Table 4.5 for list of SACs referenced on figure

Table 4.5 – SACs referenced in SAK Preferred Approach figure (Figure 4.3)

Index Code	SAC/SPA Name
K001	Tramore Dunes and Backstrand SAC
K002	River Barrow And River Nore SAC
K003	Hugginstown Fen SAC
K004	Helvick Head SAC
K005	Comeragh Mountains SAC
K006	Glendine Wood SAC
K007	Nier Valley Woodlands SAC
K008	Lower River Suir SAC
K009	Ardmore Head SAC
K010	Kilduff, Devilsbit Mountain SAC
K011	Anglesey Road SAC
K012	Galtee Mountains SAC
K013	Philipston Marsh SAC
K014	Moanour Mountain SAC
K015	Blackwater River (Cork/Waterford) SAC
K016	Glen Bog SAC
K017	Lower River Shannon SAC

4.3 Overview of Study Area L – Kilkenny

The location of Study Area L (SAL) in relation to the SE region is shown in Figure 4.1 above. The majority of the Study Area is in County Kilkenny, with small eastern parts crossing into County Carlow and Wexford. The total area of SAL is approximately 1,699km^2 and lies within the counties of Tipperary, Carlow, Kilkenny, Laois, and Wexford. The principal settlement (with a population of over 10,000) within SAL is Kilkenny (Central Statistics Office, 2016).

There are seven SACs and one SPA within the SAL boundary as shown in Table 4.6. European sites within SAL where there is potential for LSE are discussed further in Section 6.2.2.

Table 4.6 - Number of European Sites within the SAL boundary

Study Area	No. of SACs	No. of SPAs
L (Kilkenny)	7	1

4.3.1 Existing Water Supplies

SAL consists of 10 WRZs supplying a population of approximately 53,617 people via approximately 714km of distribution network. Kilkenny City is the largest demand centre, with other notable towns including New Ross and Thomastown. The sources of water supply consist of seven surface water abstractions and nine groundwater abstraction sites. The Study Area is summarised in Figure 4.4 below.

Regarding surface water availability in the Study Area, SAL is split between the River Barrow and River Nore catchments. The Barrow and Nore are two of the largest rivers in Ireland, with catchment areas of 3,025km^2 and 2,595km^2, respectively. Along with the Suir, these three principal rivers are known as the 'Three Sisters' and drain the South East region of the country. The Barrow rises in the Slieve Bloom Mountains in County Laois, flowing a distance south before crossing into SAL at Muine Bheag, turning tidal at Saint Mullins, being joined by the Nore at Ringwood before flowing through New Ross into the Suir Estuary at Cheekpoint. The Nore rises on the slopes of Borrisnoe Mountain in County Tipperary, flowing south east into SAL around Durrow, traveling through Kilkenny City, turning tidal at Inistioge, before its confluence with the Barrow. Both rivers are designated as part of the large River Barrow and River Nore SAC. Furthermore, three sub-catchments of the Barrow are designated as freshwater pearl mussel SAC catchments: Mountain, Ballymurphy and Aughavaud.

Around 80% of the water supplies to SAL come from surface water sources, with these comprised from some large river abstractions from the Nore system, and some smaller volumes taken from the Barrow catchment. The Kilkenny City WRZ, by far the largest WRZ in the Study Area, has three river abstractions: an intake from the main Nore channel near Kilkenny City feeds Troyswood WTP to supply up to 23.413Ml/d; whilst two smaller abstractions from the River Dinin sub-catchment feed Radestown WTP to supply up to 7Ml/d. In the south-east of the Study Area, within the Barrow system, abstractions from the River Pollmounty and Dranagh Impoundment sources feed the Castlemoyle WTP to supply up to 3.6Ml/d to New Ross WRZ. Elsewhere within the Barrow catchment in the north-east of the Study Area, the Mountain River source supplies up to 0.4Ml/d to Borris WRZ, and the Duiske River is combined with groundwater sources to supply up to 0.185Ml/d to Graiguenamanagh PWS WRZ.

Overall, nine groundwater sources are managed by Uisce Éireann in the region. The predominant aquifer type of the area is made up of poorly productive bedrock (69%), followed by karstic (19%), productive fissured (7%) and sand and gravel (5%). Groundwater provides around 60% of the drinking water supply in Kilkenny, highlighting its importance as a developable resource here. The region's larger groundwater supplies mainly occur in the limestones and gravels.

The poorly productive rocks consist of a combination of Namurian shales and sandstones, granites, Ordovician metasediments and Dinantian upper impure limestones. This class of rocks will often yield enough water to supply a house or small farm (0.2-0.5 l/s) and occasionally in major fracture zones may yield a good deal more. However, since the yield often depends on the permeability developed in the uppermost few metres of broken and weathered rock, yields will often decrease markedly in dry spells as the water table falls, and these supplies may therefore be unreliable. The granites, which feature in the south-east of the county, are characterised by the absence of an intergranular permeability and the

presence of low fissure permeability. Although fractured, the Ordovician rocks generally have a low permeability and are mostly regarded as a poor aquifer. The Namurian rocks can often result in groundwaters high in iron, manganese and hydrogen sulphide. This can be from contamination but more often results from a combination of natural iron sulphide within the shalier elements coupled with slow groundwater circulation.

The karst forms a key regionally important aquifer in some areas. The pure bedded limestones make up a relatively minor proportion of the bedrock in this Study Area. The distribution of permeability and yield is more homogenous where the development of karst has resulted in a more diffuse network of flow pathways. This provides a slightly more reliable flow regime than conduit dominated aquifers, however these karstic environments are still prone to pollution from point sources such as septic tanks, disposal sites and land spreading. Previous groundwater exploration in the area showed the productive limestone zones to be relatively localised and associated with areas of dolomitization Some trial well drilling in this setting has indicated the potential for large (>1 MLD) abstractions, such as at Gowran-Goresbridge-Paulstown and Bausheenmore. Often the wells may be sites proximal to high permeability fractures at depth, resulting in the larger yields. The regionally important aquifers are generally smaller in extent in this part of the country and are banded by locally important, less permeable bedrock.

The productive fissured bedrock and sand and gravel aquifers make up a relatively small proportion of the areas for potential groundwater development. The productive fissured bedrock aquifer comprises a relatively thin band of Devonian Kiltorcan-type sandstones running through the centre of the Study Area. There are a number of locally important sand and gravel aquifers in the region, namely at Bennetsbridge and Thomastown and a large gravel body stretching northwards from Kilkenny city which remains largely underdeveloped. The gravel wells at Beenetsbridge are capable of supplying approximately 2.85Ml/d. When overlying lesser productive aquifers such as at Thomastown, the gravels can provide baseflow and storage to the aquifer as well as a degree of protection from surface contaminants.

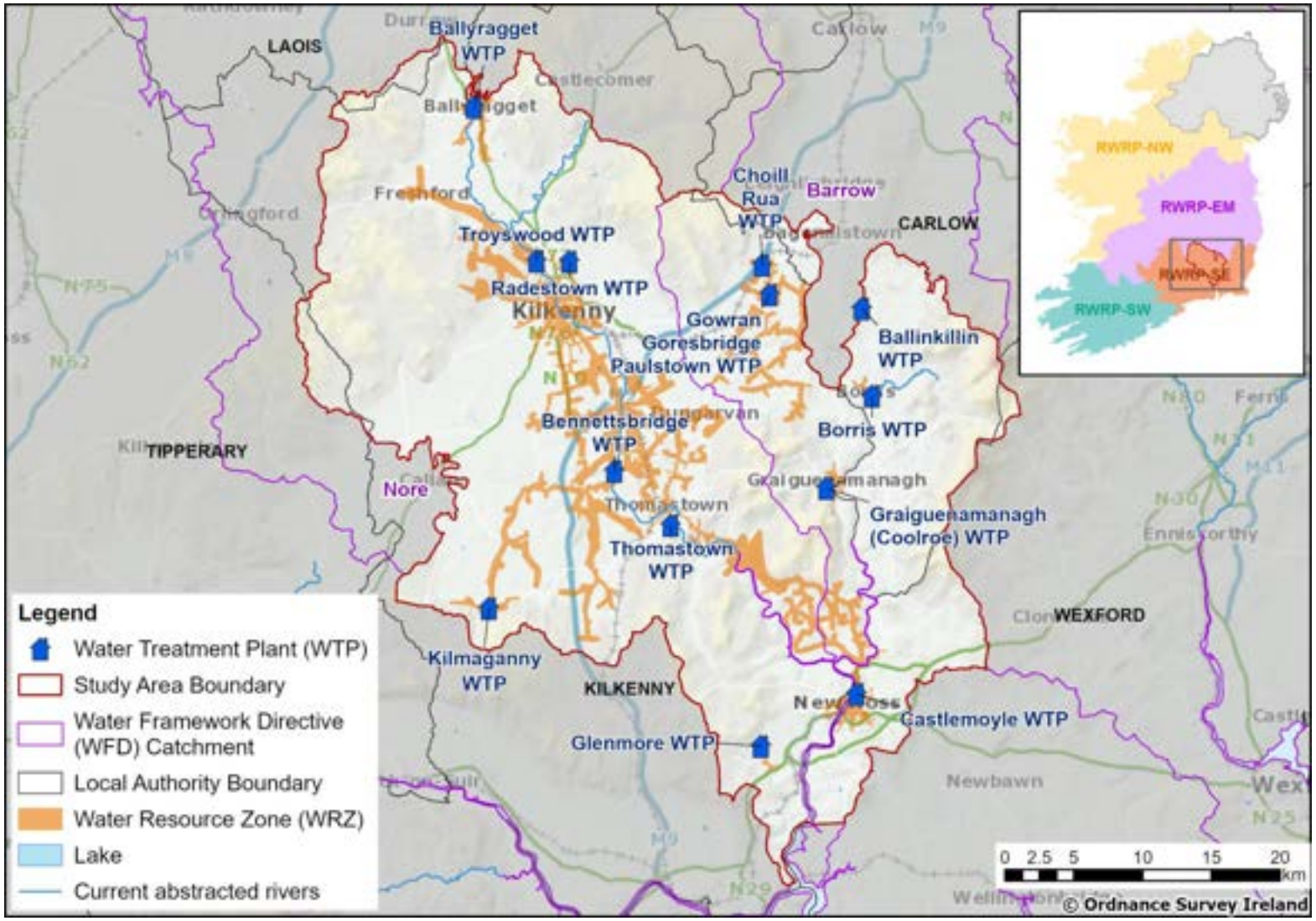

Figure 4.4 - Study Area L Kilkenny Summary

4.3.2 SAL Options Removed at Coarse Screening

The options detailed in Table 4.7 below were removed at Coarse Screening on environmental grounds.

Table 4.7 - SAL – Options removed at Coarse Screening on environmental grounds

Option Reference	Option Description	Rejection Reasoning
SAL-019	Increase existing GW abstraction from Tobergoorlick Pool and upgrade Gowran Goresbridge Paulstown WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAL-031	Increase GW abstraction and upgrade Graiguenamanagh (Coolroe) WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAL-032	Increase SW abstraction from Duiske River and upgrade Graiguenamanagh (Coolroe) WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAL-034	Riverbank filtration from River Barrow and new WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAL-044	Rationalise Thomastown to New Ross WRZ.	Abstracting the volume of water required is considered unfeasible.
SAL-046	Interconnect Thomastown with New Ross WRZ for increased resilience and supply deficit from New Ross.	Abstracting the volume of water required is considered unfeasible.
SAL-058	Increase abstraction from River Dinan and River Douglas and upgrade Radestown WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAL-059	Increase GW abstraction at Bennettsbridge WTP and new WTP to supply deficit. New WTP is required for Bennettsbridge. Decommission existing Bennettsbridge WTP.	Abstracting the volume of water required is considered unfeasible.
SAL-068	Increase SW abstraction from Dranagh impoundment/raw water storage and upgrade Castlemoyle WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAL-069	Increase SW abstraction from River Pollmounty and upgrade Castlemoyle WTP (including new fishpass) to supply deficit.	Abstracting the volume of water required is considered unfeasible.

Option Reference	Option Description	Rejection Reasoning
SAL-070	Increase SW abstraction from River Pollmounty and upgrade Castlemoyle WTP (including new fishpass) to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAL-071	Increase SW abstraction from River Pollmounty and upgrade Castlemoyle WTP (including new fishpass) to supply deficit.	Abstracting the volume of water required is considered unfeasible.

4.3.3 Preferred Approach for SAL

Full details of the Preferred Approach (and how it was reached) are included in the SAL Technical Report in Appendix 2 of the RWRP-SE. The findings of the Preferred Approach Development for SAL Kilkenny include the following:

- There are no options that score a 0 in relation to potential impact on a designated European site.
- There are two -3 scores against designated European sites within the Preferred Approach; option SAL-078 and Group option SAL-521.
- All other options within the Preferred Approach have a -2 score against European sites.

In summary, the Preferred Approach for SAL is the Combination 1 approach which consists of local WRZ option for three of the ten Water Resource Zones in the Study Area, primarily driven by the small scale of the supplies and difficulties in transporting small volumes of water over long distances. Proposed solutions for Ballyragget PWS, Borris, Ballinkillen, Gowran-Goresbridge-Paulstown, Graiguenamanagh PWS, Kilkenny City and Thomastown/Inistioge WRZs involve constructing connections across one or more supplies. The Preferred Approach for Glenmore PWS WRZs involves increasing the abstraction and upgrading the WTP to meet deficit. The preferred approach for Bennettsbridge & Kilmaganny and New Ross WRZs involve new GW abstractions and WTPs.

Delivery of the Preferred Approach will secure all of the supplies in the area in terms of Quality, Quantity, Sustainability and Resilience. The Preferred Approach for SAL Kilkenny also includes for demand side (**Lose Less** and **Use Less**) measures, including:

- Ongoing leakage management including active leakage control, pressure management and find and fix activities to offset Natural Rate of Leakage Rise (NRR).
- Nett leakage reduction in Kilkenny City Water Resource Zone, amounting to 0.321Ml/d (applied to SDB Deficit) to move towards achieving the National SELL Target by 2034.
- Continuation of Uisce Éireann household and business water conservation campaigns, initiatives and education programmes.
- The option to implement legally enforceable Water Conservation Orders in drought periods in order to protect the environment and our public water supplies.

The Preferred Approach provides benefits for the environment and European sites through decommissioning existing abstractions at Ballyragget WTP and Radestown WTP which currently extract from the River Barrow and River Nore SAC.

All of the options that make up the Preferred Approach and assessed as part of the NIS are shown in Table 4.8 and shown in Figure 4.5 below.

Table 4.8 - Final Preferred Approach for SAL – Options

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAL-083 **(Part of Grouped Option SAL-526)** 0100SC0009 Borris	-2	**Rationalise Borris WRZ to Gowran-Goresbridge-Paulstown WRZ** • WRZ in projected surplus but is to be rationalised to Gowran-Goresbridge-Paulstown WRZ • WRZ current WAFU DYCP 2044 = 0.367Ml/d, DYCP 2044 demand = 0.219Ml/d so surplus of 0.148Ml/d • Existing SW abstraction to be decommissioned • Existing SW source (Mountain (Carlow) RWB) WFD status 2016-2021 – Good
SAL-084 **(Part of Grouped Option SAL-526)** 0100SC0010 Ballinkillen	-2	**Rationalise Ballinkillen WRZ to Gowran-Goresbridge-Paulstown WRZ** • WRZ in deficit and is to be rationalised to Gowran-Goresbridge-Paulstown WRZ • WRZ current WAFU DYCP 2044 = 0.023Ml/d, DYCP 2044 demand = 0.024Ml/d so additional 0.001Ml/d required to meet WRZ deficit • Existing GW source (New Ross GWB) WFD status 2016-2021 – Good
SAL-015 1500SC0002 Glenmore PWS	-2	**Increase GW abstraction from Busherstown Springs and upgrade Glenmore WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to supply future deficit • WRZ current WAFU DYCP 2044 = 0.083Ml/d, DYCP 2044 demand = 0.117Ml/d so additional 0.033Ml/d required to meet WRZ deficit • Existing GW source (Inistioge GWB) WFD status 2016-2021 – Good
SAL-085 **(Part of Grouped Option SAL-526)** 1500SC0012 Gowran-Goresbridge-Paulstown	-2	**New GW abstraction and new WTP located at Woodquater to supply full demand, and maintain existing abstraction - currently under development** • WRZ in deficit. New GW abstraction and WTP to supply future DYCP demand • WRZ current WAFU DYCP 2044 = 1.012Ml/d, DYCP 2044 demand = 1.201Ml/d so additional 0.189Ml/d required to meet WRZ deficit • Existing GW abstractions to be decommissioned • Existing GW sources (Bagenalstown Lower GWB) WFD status 2016-2021 – Good and (Goresbridge North GWB) WFD status 2016-2021 – Good • New GW source (Bagenalstown Lower GWB) WFD status 2016-2021 – Good
SAL-078 1500SC0020	-3	**New GW abstraction and new WTP for Bennettsbridge** • WRZ in deficit. New GW abstraction and WTP to supply future DYCP demand

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
Bennettsbridge & Kilmaganny		• WRZ current WAFU DYCP 2044 = 2.77Ml/d, DYCP 2044 demand = 4.242Ml/d so additional 1.472Ml/d required to meet WRZ deficit • Existing GW abstractions to be decommissioned • Existing GW sources (Thomastown GWB) WFD status 2016-2021 – Good and (Stoneyford Gravels GWB) WFD status 2016-2021 – Good • New GW source (Stoneyford Gravels GWB) WFD status 2016-2021 – Good
SAL-073 3300SC0025 New Ross	-2	**New GW abstraction/wellfield located south of New Ross WRZ and new WTP to supply deficit** • WRZ in deficit. New GW abstraction and WTP to supply future deficit • WRZ current WAFU DYCP 2044 = 3.3Ml/d, DYCP 2044 demand = 4.442Ml/d so additional 1.142Ml/d required to meet WRZ deficit • Existing SW abstractions maintained • Existing SW source (Pollmounty SWB) WFD status 2016-2021 – Moderate • New GW source (Enniscorthy GWB) WFD status 2016-2021 – Good
SAL-052 **(Part of Grouped Option SAL-511)** 1500SC0003 Kilkenny City	-2	**Upgrade Troyswood WTP and abandon Radestown WTP** • WRZ in deficit. Increase SW abstraction to supply future deficit • WRZ current WAFU DYCP 2044 = 22.138Ml/d, DYCP 2044 demand = 14.622Ml/d so additional 7.517Ml/d required to meet WRZ deficit • Existing Radestown WTP SW abstraction to be decommissioned • Existing Troyswood WTP SW abstraction to be maintained • Existing SW sources (Dinin (Main channel) SWB) WFD status 2016-2021 – Moderate and (Nore RWB) WFD status 2016-2021 – Good
SAL-007 **(Part of Grouped Option SAL-511)** 1500SC0007 Ballyragget PWS	-2	**Rationalise Ballyragget to Kilkenny City WRZ for increased resilience and long term OPEX savings** • WRZ in projected surplus but is to be rationalised to Kilkenny City WRZ • WRZ current WAFU DYCP 2044 = 1.137Ml/d, DYCP 2044 demand = 0.565Ml/d so surplus of 0.571Ml/d • Existing GW abstraction to be decommissioned • Existing GW sources (Kilkenny-Ballynakill Gravels GWB) WFD status 2016-2021 – Good
SAL-036 **(Part of Grouped Option SAL-521)**	-3	**Rationalise Graiguenamanagh to Thomastown WRZ** • WRZ in deficit and is to be rationalised to Thomastown WRZ • WRZ current WAFU DYCP 2044 = 0.17Ml/d, DYCP 2044 demand = 0.586Ml/d so additional 0.416Ml/d required to meet WRZ deficit

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
1500SC0013 Graiguenamanagh PWS		• Existing GW and SW abstractions to be decommissioned • Existing GW sources (New Ross GWB) WFD status 2016-2021 – Good • Existing SW sources (Duiske SWB) WFD status 2016-2021 – Moderate
SAL-039 **(Part of Grouped Option SAL-521)** 1500SC0017 Thomastown/Inistioge	-3	**New GW abstraction and upgrade Thomastown WTP to supply deficit** • WRZ in deficit. New GW abstraction to supply future deficit • WRZ current WAFU DYCP 2044 = 2.292Ml/d, DYCP 2044 demand = 2.875Ml/d so additional 0.583Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW sources (Stoneyford Gravels GWB) WFD status 2016-2021 – Good and (Inistigoe GWB) WFD status 2016-2021 – Good • New GW sources (Inistigoe GWB) WFD status 2016-2021 – Good

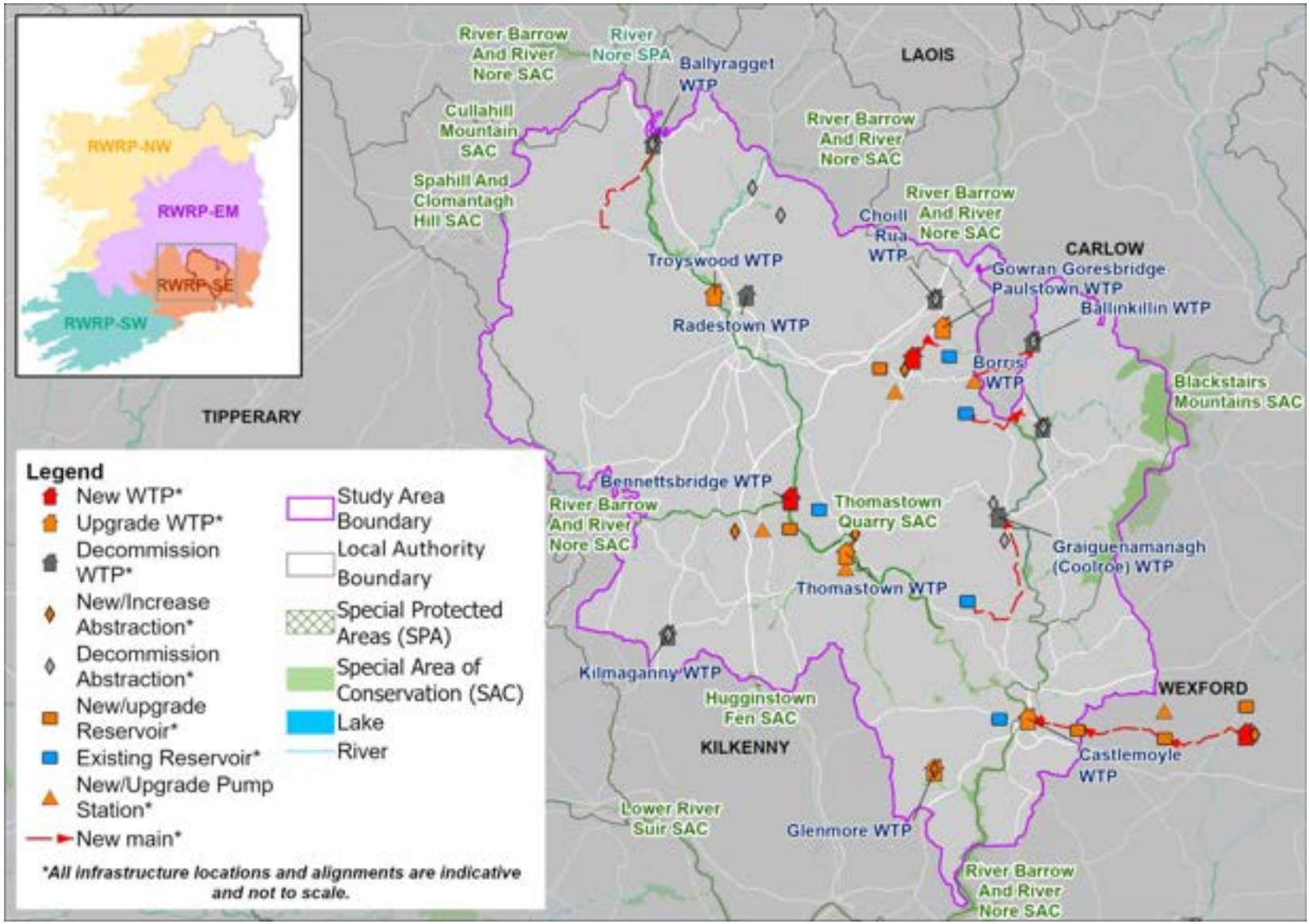

Figure 4.5 - Study Area L – Preferred Approach and European sites within SAL boundary

4.4 Overview of Study Area M – Wexford and Wicklow

The location of Study Area M (SAM) in relation to the SE region is shown in Figure 4.1 above. The majority of the Study Area is in County Wexford, with the northeast boundary in County Wicklow. The total area of SAM is approximately 2,240km^2 and lies within the counties of Carlow, Wexford, and Wicklow. The principal settlements (with a population of over 10,000) within SAM are Wexford, and Enniscorthy (Central Statistics Office, 2016).

There are fourteen SACs and seven SPAs within the SAM boundary as shown in Table 4.9. European sites within SAM where there is potential for LSE are discussed further in Section 6.2.3.

Table 4.9 - Number of European Sites within the SAM boundary

Study Area	No. of SACs	No. of SPAs
M (Wexford and Wicklow)	14	7

4.4.1 Existing Water Supplies

SAM consists of 26 WRZs supplying a population of approximately 100,642 people via approximately 1,716km of distribution network. Wexford Town is the largest demand centre, with other notable towns including Gorey and Enniscorthy. The sources of water supply consist of ten surface water abstractions and 27 groundwater abstraction sites. The Study Area is summarised in Figure 4.6 below.

Regarding surface water availability, most of SAM is within the large River Slaney & Wexford Harbour catchment, whilst elsewhere the Study Area crosses into the small catchments of the Ballyteigue-Bannow catchment in the south, and the River Owenavorragh catchment in the north east. The River Slaney rises on Lugnaquillia Mountain, draining the western Wicklow Mountains as it flows south, crossing into SAM at Bunclody, continuing south across central County Wexford, becoming tidal at Enniscorthy before entering Wexford Harbour at Wexford Town. The Slaney has a total catchment area of 1,980km^2, and is designated as the Slaney River Valley SAC. In comparison, the Ballyteigue-Bannow and Owenavorragh catchments are much smaller coastal catchments characterised by several short rivers flowing to sea.

Around 50% of the water supplies to SAM come from surface water sources, with most of these being river abstractions from the River Slaney system. The Wexford Town WRZ, the largest WRZ in SAM, is supplied by an abstraction from the River Sow (tributary of the Slaney) and a small impounding reservoir source, Coolree, which combine to deliver up to 7.5Ml/d to Newtown WTP. Elsewhere in the Slaney catchment, in the centre of the Study Area, the Enniscorthy WRZ is supplied by an abstraction from the main Slaney channel which feeds Vinegar Hill WTP to deliver up to 4Ml/d. The Sow Regional WRZ is supplied from a combination of groundwater and an abstraction from the River Sow, feeding Killmallock Bridge WTP to deliver up to 3.2Ml/d. In the north east of the WRZ, the Gorey WRZ is supplied from two abstractions from the River Bann (tributary of the Slaney), which are supplemented by groundwater to feed Creagh WTP to deliver up to 2.5Ml/d. There is another notable surface water abstraction in the south of the Study Area, where the South Regional WRZ is supplied by an abstraction from the River Owenduff (part of the Owenavorragh catchment), feeding Taylorstown WTP to deliver up to 5.45Ml/d.

Overall, 27 groundwater sources are managed by Uisce Éireann in the region. The predominant aquifer type of the area is made up of poorly productive bedrock (70%), followed by productive fissured (22%), gravel (5%) and karstic (3%). Surface water abstractions dominate the total water supply for the region,

highlighting the vast areas underlain by poorly productive aquifers with lower potential. There are extensive swathes of productive fissured bedrock stretching from Gorey in the northeast to Stradbally on the coast of Waterford, which could offer potential for groundwater development however challenging.

The poorly productive rocks consist primarily of Ordovician and Cambrian metasediments. This class of rocks will often yield enough water to supply a house or small farm (0.2-0.5 l/s) and occasionally in major fracture zones may yield a good deal more. However, since the yield often depends on the permeability developed in the uppermost few metres of broken and weathered rock, yields will often decrease markedly in dry spells as the water table falls, and these supplies may therefore be unreliable. The Precambrian quartzites, which feature in the south-east of the county, are characterised by the absence of an intergranular permeability and the presence of low fissure permeability. Although fractured the Ordovician rocks generally have a low permeability and are mostly regarded as a poor aquifer. The Cambrian rocks, mostly seen in southeast Wexford, generally show low aquifer potential but are occasionally capable of supplying group schemes and small commercial interests.

An extensive body of productive fissured bedrock, made up primarily of volcanics, stretches from Gorey in the northeast to Stradbally on the coast of Waterford. The most productive yields are sourced from the well-developed fissures in the felsic rhyolites and andesites, which appear to decrease the further south west one moves from Gorey in Wexford. Lower permeabilities and yields can be more common here, with intrusive rocks forming a barrier to groundwater flow. There are some productive wellfields in this formation, such as Gorey in Wexford which has in the past supplied upwards of 7Ml/d.

There are extensive swathes of regionally important karst aquifer in some areas, particularly in south east Wexford. The distribution of permeability and yield is more homogenous where the development of karst has resulted in a more diffuse network of flow pathways. This provides a slightly more reliable flow regime than conduit dominated aquifers, however these karstic environments are still prone to pollution from point sources such as septic tanks, disposal sites and land spreading. A number of large abstractions take place from these pure bedded limestones, namely Fardystown (supplies c. 9.5Ml/d) in Wexford. The regionally important aquifers are generally smaller in extent in this part of the country and are banded by lesser productive bedrock aquifers.

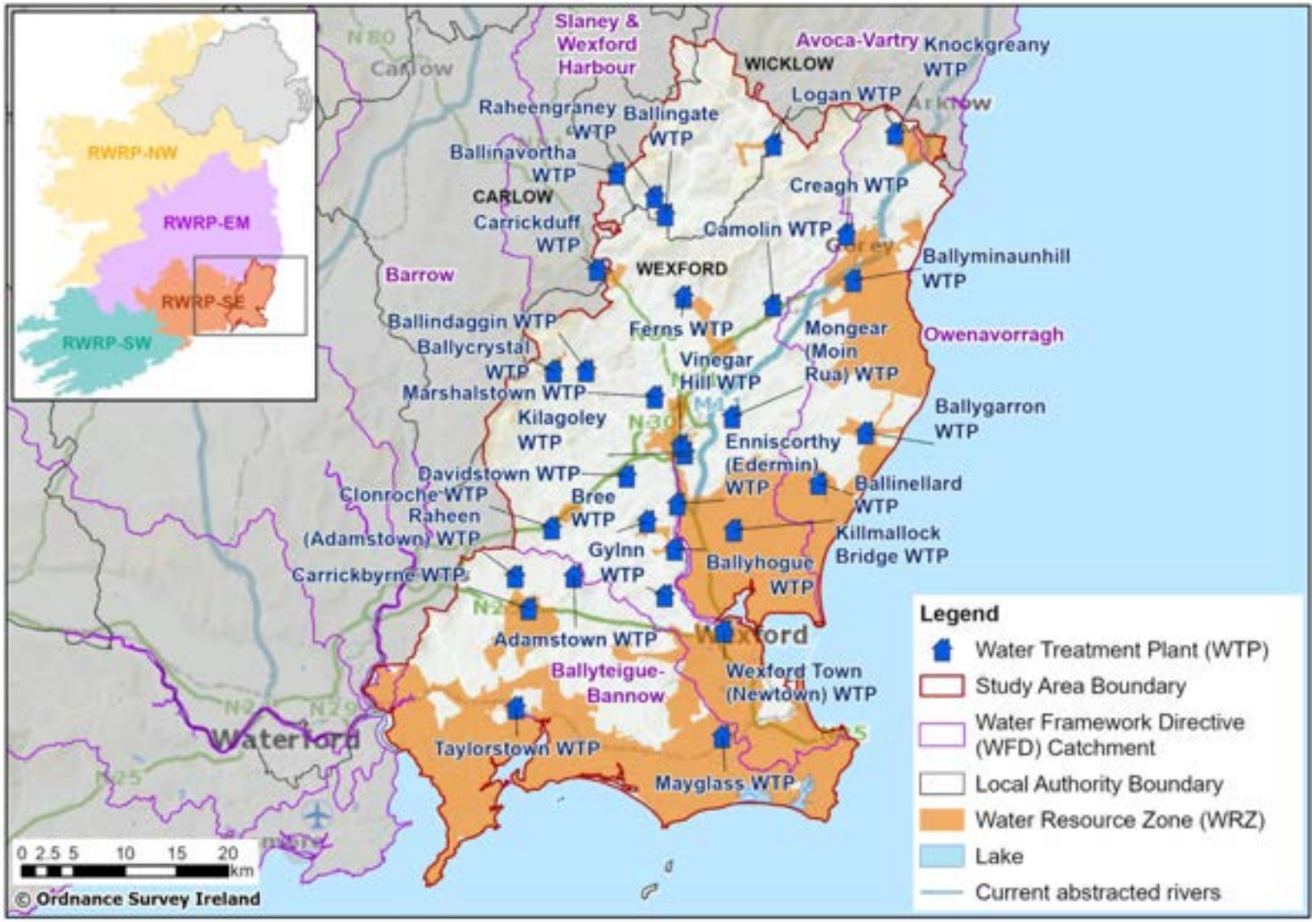

Figure 4.6 - Study Area M Wexford and Wicklow Summary

4.4.2 SAM Options Removed at Coarse Screening

The options detailed in Table 4.10 below were removed at Coarse Screening on environmental grounds.

Table 4.10 – SAM – Options removed at Coarse Screening on environmental grounds

Option Reference	Option Description	Rejection Reasoning
SAM-010	Increase SW abstraction from River Bann (Pallis Upper) and upgrade Creagh WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-011	Increase SW abstraction from River Bann (Kilmichael) and upgrade Creagh WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-012	New SW abstraction from River Owenavorragh and new WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-028	Increase SW abstraction from Ballingale Stream and upgrade Ferns WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-037	Increase SW abstraction from Bakers Stream and Clody River and upgrade Carrickduff WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-039	Increase GW abstraction and upgrade Kilmyshall WTP to partly supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-049	Interconnect Kiltealy with neighbouring Rathnure/Blackstairs GWS and supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAM-051	Interconnect Ballindaggin with neighbouring Rathnure/Blackstairs GWS and supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAM-054	Interconnect Ballindaggin and Bola Beg WTP and supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-069	Rationalise Enniscorthy to Sow Regional WRZ.	Abstracting the volume of water required is considered unfeasible. This option also requires a significant length of pipeline.
SAM-070	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible. This option also requires a significant length of pipeline.

Option Reference	Option Description	Rejection Reasoning
SAM-071	Interconnect Enniscorthy with Sow Regional WRZ for increased resilience and supply deficit.	The plan required a significant length of the pipeline. Therefore, it was considered not feasible at coarse screening stage, due to age of water and sedimentation. Rationalisation of the WRZs individually or in smaller groups was considered in other options. This option has also yield issues.
SAM-072	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	The plan required a significant length of the pipeline. Therefore, it was considered not feasible at coarse screening stage, due to age of water and sedimentation. Rationalisation of the WRZs individually or in smaller groups was considered in other options. This option has also yield issues.
SAM-082	Interconnect Bree with Sow Regional WRZ for increased resilience and supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-083	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-091	Interconnect Ballyhogue with Sow Regional WRZ (Kilmallock Bridge WTP) and supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-092	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-095	Rationalise Ballyhogue to Sow Regional WRZ (Killmallock Bridge WTP).	Abstracting the volume of water required is considered unfeasible.
SAM-096	Increase GW abstraction at Kilmallock Bridge WTP to supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-103	Interconnect Clonroche with neighbouring Rathnure/Blackstairs GWS and supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAM-126	Increase GW abstraction and three new wells at Ballinellard WTP to supply deficit.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving WFD objectives.
SAM-128	Increase SW abstraction from River Owenduff and upgrade Taylorstown WTP to partly supply deficit.	The desktop assessments undertaken indicate that increase of surface water abstraction is not feasible.

Option Reference	Option Description	Rejection Reasoning
SAM-130	Increase SW abstraction from River Sow and upgrade Killmallock Bridge WTP to partly supply deficit.	The desktop assessments undertaken indicate that increase of surface water abstraction is not feasible.
SAM-131	Increase SW abstraction from Coolree impoundment and upgrade Newtown WTP to partly supply deficit.	The desktop assessments undertaken indicate that increase of surface water abstraction is not feasible.
SAM-170	New GW abstraction and new WTP to supply Sow Regional deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-181	Develop Ballyfarnogue well and new WTP to partly supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-208	New GW and new WTP in Castlebridge village.	Abstracting the volume of water required is considered unfeasible.
SAM-209	Interconnect Sow Regional and Gorey and supply deficit.	Abstracting the volume of water required is considered unfeasible.
SAM-210	Increase abstraction in Gorey and interconnect with Sow regional.	Abstracting the volume of water required is considered unfeasible.

4.4.3 Preferred Approach for SAM

Full details of the Preferred Approach (and how it was reached) are included in the SAM Technical Report in Appendix 3 of the RWRP-SE. The final Preferred Approach for SAM is shown in Table 4.11 below. The findings of the Preferred Approach Development for SAM Wexford and Wicklow at WRZ level, include the following:

- There are five options that scores a 0 in relation to potential impact on a designated European site.
- There is one -3 score against designated European sites within the Preferred Approach; option SAM-036.
- The remaining options within the Preferred Approach have either a -1 or a -2 score against European sites.

In summary, the Preferred Approach for SAM is the Combination 1 approach which consists of local WRZ solutions for 17 of the 26 WRZs, primarily driven by the small scale of the supplies and difficulties in transporting small volumes of water over long distances. There are nine WRZs that involve constructing connections across one or more supplies. The Preferred Approach will result in a reduction of WRZs from 26 to 22. Four of the existing 26 abstractions in SAM are proposed to be decommissioned, providing significant environmental benefit.

Delivery of the Preferred Approach will secure all of the supplies in the area in terms of Quality, Quantity, Sustainability and Resilience. The Preferred Approach for SAM Wexford and Wicklow also includes for demand side (**Lose Less** and **Use Less**) measures, including:

- Ongoing leakage management including active leakage control, pressure management and find and fix activities to offset Natural Rate of Leakage Rise (NRR).
- Nett leakage reduction in Gorey, Enniscorthy and Fardystown Water Resource Zones, amounting to 0.238Ml/d (applied to SDB Deficit) to move towards achieving the National SELL Target by 2034.
- Continuation of Uisce Éireann household and business water conservation campaigns, initiatives and education programmes.
- The option to implement legally enforceable Water Conservation Orders in drought periods in order to protect the environment and our public water supplies.

All of the options that make up the final Preferred Approach and assessed as part of the NIS are shown in Table 4.11 and shown in Figure 4.7 below.

Table 4.11 - Final Preferred Approach for SAM – Options

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAM-004 **(Part of Grouped Option SAM-501)** 3300SC0020 Coolgreaney WS	0	**Rationalise Coolgreaney to Arklow WRZ (SA1 increase GW abstraction)** • Coolgreaney WRZ in deficit. Coolgreaney WRZ to be rationalised to Arklow WRZ • WRZ current WAFU DYCP 2044 = 0.642Ml/d, DYCP 2044 demand = 0.679Ml/d so additional 0.037Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Inch GWB) WFD status 2016-2021 – Good
SAM-198 3300SC0001 Gorey	0	**Upgrade Creagh WTP for water quality improvements. Rationalise Kilmuckridge (Ballygarron) WTP to new Ballyminaunhill WTP. Rationalisation within WRZ** • WRZ in projected surplus. Ballygarron WTP to be rationalised to Ballyminaunhill WTP • WRZ current WAFU DYCP 2044 = 11.856Ml/d, DYCP 2044 demand = 11.451Ml/d so surplus of 0.405Ml/d • Existing Ballygarron WTP GW abstraction to be decommissioned • Existing Ballyminaunhill and Creagh WTPs, GW and SW abstractions maintained • Existing GW abstraction (Inch GWB) WFD status 2016-2021 – Good and (Gorey GWB) WFD status 2016-2021 – Good • Existing SW abstraction (Bann_030 SWB) WFD status 2016-2021 – Good and (Bann_030 SWB) WFD status 2016-2021 – Good
SAM-017 3300SC0002 Camolin WSS	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in projected surplus. WTP WQ upgrade only • WRZ current WAFU DYCP 2044 = 0.183Ml/d, DYCP 2044 demand = 0.174Ml/d so surplus of 0.01Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Enniscorthy GWB) WFD status 2016-2021 – Good
SAM-029 3300SC0003 Ferns WS	-2	**New GW abstraction and new WTP to supply deficit** • WRZ in deficit. New GW abstraction and WTP to meet future deficit • WRZ current WAFU DYCP 2044 = 0.596Ml/d, DYCP 2044 demand = 0.867Ml/d so additional 0.271Ml/d required to meet WRZ deficit • New GW abstraction (Enniscorthy GWB) WFD status 2016-2021 – Good
SAM-036	-3	**New GW abstraction and upgrade Carrickduff WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
3300SC0004 Bunclody WS		• WRZ current WAFU DYCP 2044 = 0.704Ml/d, DYCP 2044 demand = 1.436Ml/d so additional 0.732Ml/d required to meet WRZ deficit • New GW abstraction (Ballyglass GWB) WFD status 2016-2021 – Good
SAM-044 3300SC0012 Kiltealy	-1	**Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.038Ml/d, DYCP 2044 demand = 0.108Ml/d so additional 0.07Ml/d required to meet WRZ deficit • Existing GW abstraction (Ballyglass GWB) WFD status 2016-2021 – Good
SAM-050 3300SC0011 Ballindaggin	-1	**Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.083Ml/d, DYCP 2044 demand = 0.144Ml/d so additional 0.061Ml/d required to meet WRZ deficit • Existing GW abstraction (Ballyglass GWB) WFD status 2016-2021 – Good
SAM-061 3300SC0014 Monagear	-1	**Increase GW abstraction and upgrade Monagear WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.064Ml/d, DYCP 2044 demand = 0.113Ml/d so additional 0.049Ml/d rquired to meet WRZ deficit • Existing GW abstraction (Enniscorthy GWB) WFD status 2016-2021 – Good
SAM-073 3300SC0015 Davidstown	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in projected surplus, WTP WQ upgrade only • WRZ current WAFU DYCP 2044 = 0.073Ml/d, DYCP 2044 demand = 0.023Ml/d so surplus of 0.051Ml/d • Existing GW abstraction maintained • Existing GW abstraction (Enniscorthy GWB) WFD status 2016-2021 – Good
SAM-100 3300SC0013 Clonroche	-1	**New GW abstraction and upgrade Clonroche WTP to supply full demand** • WRZ in deficit. New GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.275Ml/d, DYCP 2044 demand = 0.37Ml/d so additional 0.095Ml/d to meet WRZ deficit • New GW abstraction (Enniscorthy GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAM-105 3300SC0027 Woodview Drive Adamstown	0	**Increase GW abstraction and upgrade WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.018Ml/d, DYCP 2044 demand = 0.034Ml/d so additional 0.016Ml/d required to meet WRZ deficit • Existing GW abstraction (Adamstown GWB) WFD status 2016-2021 – Good
SAM-108 3300SC0066 Raheen (Adamstown)	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in projected surplus. WTP WQ upgrade only • WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.005Ml/d so surplus of 0.004Ml/d • Existing GW abstraction (Adamstown GWB) WFD status 2016-2021 – Good
SAM-148 3300SC0078 Fardystown	-1	**New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused BHs back to production (GW abstraction from existing BHs currently not in supply)** • WRZ in deficit. New GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 10.45Ml/d, DYCP 2044 demand = 13.827Ml/d so additional 3.377Ml/d to meet WRZ deficit • Existing GW abstractions maintained • Existing GW abstraction (Fardystown GWB) WFD status 2016-2021 – Good • New GW abstraction (Fardystown GWB) WFD status 2016-2021 – Good
SAM-127 & SAM-207 3300SC0080 Sow Regional	-1	**Increase GW abstraction and upgrade WTP to partly supply deficit. New GW and new WTP to partly supply deficit** • WRZ in deficit. Increase GW abstraction, new GW abstraction and new WTP to meet future deficit • WRZ current WAFU DYCP 2044 = 3.346Ml/d, DYCP 2044 demand = 4.97Ml/d so additional 1.624Ml/d required to meet WRZ deficit • Existing GW abstractions maintained • Existing GW abstraction (Curracloe Gravels GWB) WFD status 2016-2021 – Good and (Castlebridge North GWB) WFD status 2016-2021 – Good • Existing SW abstraction (Sow_020 SWB) WFD status 2016-2021 – Moderate • New GW abstraction (Castlebridge North GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAM-141 3400SC0045 Ballynavortha Public Supply	-1	**Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit** • WRZ in deficit. Increase GW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 0.001Ml/d, DYCP 2044 demand = 0.003Ml/d so additional 0.002Ml/d required to meet WRZ deficit • Existing GW abstraction (Ballyglass GWB) WFD status 2016-2021 – Good
SAM-144 3400SC0010 Coolboy Coolafancy Public Supply	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in projected surplus, WTP WQ upgrade only • WRZ current WAFU DYCP 2044 = 0.19Ml/d, DYCP 2044 demand = 0.151Ml/d so surplus of 0.039Ml/d • Existing GW abstraction (Ballyglass GWB) WFD status 2016-2021 – Good
SAM-146 3400SC0013 Raheengraney Public Supply	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • WRZ in projected surplus, WTP WQ upgrade only • WRZ current WAFU DYCP 2044 = 0.006Ml/d, DYCP 2044 demand = 0.003Ml/d so surplus of 0.002Ml/d • Existing GW abstraction (Ballyglass GWB) WFD status 2016-2021 – Good
SAM-149 3300SC0081 Wexford Town	-1	**New GW wellfield at Adamstown and new WTP to supply deficit** • WRZ in deficit. New GW abstraction and new WTP to supply future deficit • WRZ current WAFU DYCP 2044 = 4.495Ml/d, DYCP 2044 demand = 11.208Ml/d so additional 6.713Ml/d required to meet WRZ deficit • New GW abstraction (Enniscorthy GWB) WFD status 2016-2021 – Good
SAM-140 **(Part of Grouped Option SAM-547)** 3400SC0053 Ballingate Public Supply	-1	**Rationalise Ballingate to Tinahely WRZ (SA1)** • WRZ in deficit. WRZ to be rationalised to Tinahely WRZ • WRZ current WAFU DYCP 2044 = 0.003Ml/d, DYCP 2044 demand = 0.005Ml/d so additional 0.002Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Ballyglass GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAM-224 **(Part of Grouped Option SAM-575)** 3300SC0022 Carrickbyrne WS	-1	**Rationalise Carrickbyrne to South Regional WRZ** • WRZ in deficit. WRZ to be rationalised to South Regional WRZ • WRZ current WAFU DYCP 2044 = 0.413Ml/d, DYCP 2044 demand = 0.746Ml/d so additional 0.334Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Adamstown GWB) WFD status 2016-2021 – Good
SAM-225 **(Part of Grouped Option SAM-575)** 3300SC0079 South Regional	-1	**New GW abstraction and new WTP to supply deficit** • WRZ in deficit. New GW abstraction and new WTP to meet future deficit • WRZ current WAFU DYCP 2044 = 4.996Ml/d, DYCP 2044 demand = 7.53Ml/d so additional 2.534Ml/d required to meet WRZ deficit • New GW abstraction (Adamstown GWB) WFD status 2016-2021 – Good
SAM-226 **(Part of Grouped Option SAM-576)** 3300SC0023 Enniscorthy Town	-2	**Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit** • WRZ in deficit. Increase SW abstraction to meet future deficit • WRZ current WAFU DYCP 2044 = 4.129Ml/d, DYCP 2044 demand = 6.453Ml/d so additional 2.324Ml/d required to meet WRZ deficit • Existing GW and SW abstractions maintained • Existing GW abstraction (Enniscorthy GWB) WFD status 2016-2021 – Good • Existing SW abstraction (Slaney_170 RWB) WFD status 2016-2021 – Good
SAM-227 **(Part of Grouped Option SAM-576)** 3300SC0077 Bree	-2	**Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ** • WRZ in deficit. WRZ to be rationalised to Enniscorthy WRZ • WRZ current WAFU DYCP 2044 = 0.128Ml/d, DYCP 2044 demand = 0.316Ml/d so additional 0.188Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Enniscorthy GWB) WFD status 2016-2021 – Good
SAM-228 **(Part of Grouped Option SAM-576)** 3300SC0032	-2	**Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ** • WRZ in deficit. WRZ to be rationalised to Enniscorthy WRZ • WRZ current WAFU DYCP 2044 = 0.062Ml/d, DYCP 2044 demand = 0.109Ml/d so additional 0.047Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Castlebridge North GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
Ballyhogue		
SAM-229 **(Part of Grouped Option SAM-576)** 3300SC0017 Glynn WS	-2	**Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ** • WRZ in deficit. WRZ to be rationalised to Enniscorthy WRZ • WRZ current WAFU DYCP 2044 = 0.037Ml/d, DYCP 2044 demand = 0.084Ml/d so additional 0.048Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW abstraction (Castlebridge North GWB) WFD status 2016-2021 – Good
SAM-230 **(Part of Grouped Option SAM-576)** 3300SC0010 Marshalstown	-2	**Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ** • WRZ in projected surplus deficit, however WRZ to be rationalised to Enniscorthy WRZ • WRZ current WAFU DYCP 2044 = 0.028Ml/d, DYCP 2044 demand = 0.025Ml/d so surplus of 0.003Ml/d • Existing GW abstraction to be decommissioned • Existing GW abstraction (Ballyglass GWB) WFD status 2016-2021 – Good

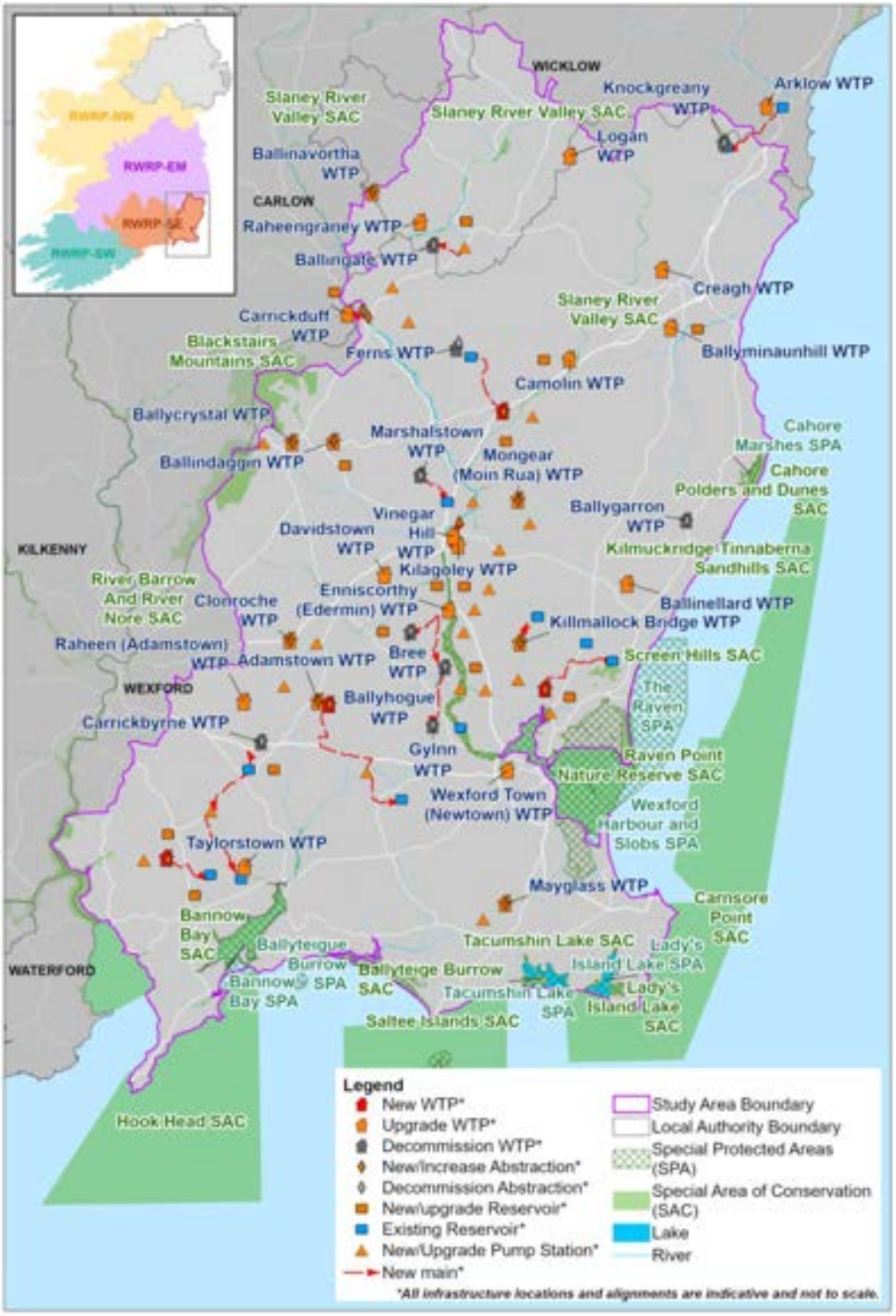

Figure 4.7 - Study Area M – Preferred Approach and European sites within SAM boundary

5 Summary of Screening for Appropriate Assessment

5.1 Identification of potential impacts and pathways for effect

Table 5.1 outlines broad categories of potential impacts that could occur as a result of construction and or operation of the Preferred Approach for each Study Area, and the likely significant effects on European sites and their qualifying interest.

Table 5.1 - Potential effect pathways of Preferred Approaches arising from the RWRP-SE

Broad categories of potential impacts on European sites	Potential effect pathways *(distance assumptions shown in italics)*
Physical loss of habitats/supporting habitat *(Construction-related)*	• Development of built infrastructure associated with the various options, for example pipelines, WTPs, temporary weirs and access routes, could result in direct loss of QI habitat (terrestrial or aquatic) in a European site (for example, smothering of gravel beds). *Physical loss of habitat is only likely to be significant if it is within the boundary of a European site, or within an area of supporting habitat outside of the European site (for example, off-site area of known foraging, roosting, breeding habitat for a QI for which a European site is designated).*
Mortality *(Construction-related)*	• Mortality of some species could occur through an increase in wildlife casualty incidents, for example through smothering of spawning gravels from a pollution event during construction. • Mortality may also occur as a result of pollution events to habitats that support QI animal or plant species during construction, in particular aquatic QI species.
Habitat degradation – changes in water quality (pollution) *(Construction-related)*	• Water quality can be affected by oil, chemicals, heavy metals and other material, or through chronic runoff of such materials. • Water quality can also be affected by sedimentation through runoff from construction sites. Construction of new infrastructure as a result of options taken forward could result in both acute and chronic runoff of sediments. • Changes in water quality could directly affect QI species or habitats or affect them indirectly through loss of aquatic prey species, or through changes in their habitat. *Pollution effects can occur outside of a European site and at a distance from works (for example, via a hydrological link).*
Disturbance (including biological disturbance) *(Construction-related)*	• Development associated with any potential option taken forward could result in disturbance of QI species. This disturbance may include, but not be limited to, noise, vibration, movement (of people and/or vehicles) and lighting. • Disturbance may lead to the abandonment of habitats or resting sites by QI species, which could include designated or supporting habitats outside of a European site[14] • Creation of new pathways for non-native invasive species.
Habitat degradation – hydrological/ hydrogeological changes *(Operation-related)*	• Operational effects from the construction phase related to tunnelling and deep excavations affecting groundwater quality and/or quantity and thereby the existing hydrological regime. • Operational effects due to ground and/or surface water abstraction. • Changes in hydrology can alter geomorphological processes which can affect the deposition of shingle or other material potentially impacting on QI fish species

[14] The need to consider use of habitat areas outside of an SPA by SCI bird species is set out in the Conservation Objectives Supporting Documents for a number of SPAs. For example, the North Bull Island and South Dublin Bay and River Tolka Estuary SPA Conservation Objectives Supporting Documents Version 1 (NPWS, 2014) states: "*Ex-situ factors: several of the listed waterbird species may at times use habitats situated within the immediate hinterland of the SPA or in areas outside of the SPA but ecologically connected to it. The reliance on these habitats will vary from species to species and from site to site*." Where SPAs do not have site specific conservation objectives, this is the approach taken. Furthermore, this document notes that brent geese from this and surrounding SPAs in the Dublin area feed at inland (terrestrial grassland) sites but roost within the SPA.

Broad categories of potential impacts on European sites	Potential effect pathways *(distance assumptions shown in italics)*
	amongst others. • Changes in these processes can impact aquatic/riparian/terrestrial habitats and species either directly or indirectly. • Brine discharged during operation of a desalination plant may lead to increased salinity and thermal changes in the surrounding marine habitat. This has the potential to alter the diversity, activity and abundance of species within and surrounding the habitat it disperses into.
Water table/availability *(Operation-related)*	• Changes to water levels and flows due to water abstraction from ground or surfaces waters. *These effects are only likely to be significant where the boundary of the scheme extends within the same ground or surface water catchment as the European site.*

5.2 Assessment of Likely Significant Effects

The AA screening report for the RWRP-SE is provided in Appendix A. The RWRP-SE has applied the methodology developed in the Framework Plan to identify suitable water resource management options for the various WRZs throughout the region. The focus of the RWRP-SE is on the South East region (core baseline area – see Section 3.5 of the SEA Scoping Report).

All of the Preferred Approaches as outlined in Chapters 4.2 to 4.4 identified in the RWRP-SE have been considered for their potential for LSE as part of this NIS for the RWRP-SE (as presented in Appendix C). The Preferred Approaches with identified potential LSEs that could lead to adverse effects on site integrity (AESI) are assessed for the purposes of AA in Chapter 6 of this report. Where Preferred Approaches were determined not to give rise to potential LSEs, no further assessment for the purposes of AA was carried out.

6 Assessment of Adverse Effects on Site Integrity

6.1 Preferred Approach taken forward to Appropriate Assessment

This section assesses the LSEs that may occur from the identified impact pathways as a result of progressing activities associated with the various Preferred Approaches for South East region (Study Areas K-M), the implications they may have for European site(s) and their conservation objectives, and mitigation measures required to ensure there are no AESI.

As outlined above, all of the Preferred Approaches identified in the RWRP-SE were considered for their potential to give rise to LSEs as part of this NIS. The Preferred Approaches outlined in Chapter 6 below were assessed as having potential for LSEs (see Appendix C) and therefore taken forward to full AA. As noted in Section 5.2, a number of other Preferred Approaches were assessed as not having the potential for LSEs (see Appendix C), and therefore no further assessment was carried out of those options for the purposes of AA.

6.1.1 Study Area K

The Preferred Approaches for SAK with potential for LSEs on European sites are shown in Table 6.1.1.

Table 6.1.1 – SAK Preferred Approaches subject to AA

WRZ Name and Option Reference	Option Description
SAK-648 1500SC0001 South Kilkenny Environs	Bring back Silverspring WTP to production and supply deficit
SAK-073 1500SC0019 Piltown-Fiddown	New GW and upgrade Jamestown WTP to supply deficit (progressing as project to address RAL)
SAK-077 1500SC0005 Callan PWS	Increase GW abstraction from existing spring and BH and upgrade Callan WTP to supply deficit
SAK-106 2900SC0042 Templemore/Templetuohy	Rationalise Templetuohy to Templemore [rationalise to College Hill WTP]. Rationalisation within WRZ
SAK-120 2900SC0032 Galtee Regional	New SW abstraction from Aherlow river and upgrade Rossadrehid WTP, Thomas Augmentation WTP, Springmount Source WTP and Farranamnagh WTP for water quality and to supply deficit
SAK-180 2900SC0049 Tipperary Town Supply	New GW abstraction, new WTP to supply deficit and upgrade of Fawnagown WTP for water quality purposes
SAK-211 2900SC0023 Burncourt Ballylooby	Increase GW abstraction from two BHs and upgrade Ballylooby Springs WTP to supply deficit
SAK-386 3100SC0077 Ballynoe/Melleray	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit

WRZ Name and Option Reference	Option Description
SAK-387 3100SC0111 Deelish/Ballinacourty	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAK-441 3100SC0054 Ballymacarbry	New GW abstraction (karstic) and new WTP to supply deficit
SAK-444 3100SC0027 Boolavoonteen/Kilcooney/Touraneena	Increase GW abstraction from Tooraneena BH and upgrade Touraneena WTP to supply deficit
SAK-450 3100SC0079 Adramone/Kilrossanty	Increase GW abstraction from Kilrossanty BH and upgrade Kilrossanty WTP to supply deficit
SAK-783 **(Part of Grouped Option SAK-995)** 3100SC0001 Dungarvan	Increase GW abstraction from four BH and upgrade Ballinamuck WTP to supply deficit
SAK-472 3100SC0051 Ballyguiry	Increase GW abstraction from Ballyguiry BH and and upgrade Ballyguiry WTP to supply deficit
SAK-476 **(Part of Grouped Option SAJ-614)** 3100SC0053 Inchinleamy	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAK-477 3100SC0112 Modeligo	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAK-478 3100SC0114 Liskealty	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAK-525 3100SC0044 Garryahylish	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAK-530 **(Part of Grouped Option SAK-949)** 3100SC0035 Smoore	Rationalise Smoore to East Waterford WRZ [new SW abstraction from River Suir]

WRZ Name and Option Reference	Option Description
SAK-560 & SAK-618 3100SC0124 Portlaw	Increase GW abstraction from Portlaw BH and Portlaw spring and upgrade Portlaw WTP to partly supply deficit. New GW abstraction and new WTP to partly supply deficit
SAK-569 3100SC0120 Lyrenaleara	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAK-604 **(Part of Grouped Option SAK-949)** 3100SC0102 Kill/Ballylaneen	Rationalise Kill/Ballylaneen to East Waterford WRZ [new SW abstraction from River Suir]
SAK-289 **(Part of Grouped Option SAK-837)** 2900SC0024 Carrick-On-Suir	New GW abstraction and new Linguan WTP to supply deficit
SAK-265 **(Part of Grouped Option SAK-837)** 3100SC0089 Rathgormack	Rationalise Rathgormack to Carrick on Suir WRZ [Linguan WTP]
SAK-269 **(Part of Grouped Option SAK-837)** 3100SC0107 Ballyknock	Rationalise Ballyknock to Carrick-on-Suir WRZ [Linguan WTP]
SAK-271 **(Part of Grouped Option SAK-837)** 3100SC0110 Crehanagh	Rationalise Crehanagh to Carrick-on-Suir WRZ [Linguan WTP]
SAK-273 **(Part of Grouped Option SAK-837)** 3100SC0108 Garravoone	Rationalise Garravoone to Carrick on Suir WRZ [Linguan WTP]
SAK-222 **(Part of Grouped Option SAK-853)** 2900SC0026 Fethard & Mullenbawn Regional Public Water Supply	Increase abstraction at Mullinbawn spring and upgrade Mullinbawn WTP to supply deficit to neighbouring WRZ in deficit
SAK-239 **(Part of Grouped Option SAK-853)** 2900SC0067	Interconnect Coalbrook/Commons and Fethard & Mullenbawn and supply deficit from Fethard & Mullenbawn [Mullinbawn WTP]

WRZ Name and Option Reference	Option Description
Coalbrook/Commons	
SAK-784 **(Part of Grouped Option SAK-995)** 3100SC0083 Stradbally	Rationalise Stradbally to Dungarvan WRZ
SAK-785 **(Part of Grouped Option SAK-995)** 3100SC0093 Graiguenageeha	Rationalise Graiguenageeha to Dungarvan WRZ
SAK-608 **(Part of Grouped Option SAK-949)** 3100SC0101 Scrahan	Rationalise Scrahan to East Waterford WRZ [new SW abstraction from River Suir]
SAK-399 **(Part of Grouped Option SAK-949)** 3100SC0097 Ballyogarty	Rationalise Ballyogarty to East Waterford WRZ [new SW abstraction from River Suir]
SAK-438 **(Part of Grouped Option SAK-949)** 3100SC0099 Kilmacthomas	Rationalise Kilmacthomas to East Waterford WRZ [new SW abstraction from River Suir]
SAK-501 **(Part of Grouped Option SAK-949)** 3100SC0042 Faha	Rationalise Faha to East Waterford WRZ [new SW abstraction from River Suir]
SAK-555 **(Part of Grouped Option SAK-949)** 3100SC0045 Fews	Rationalise Fews to East Waterford WRZ [new SW abstraction from River Suir]
SAK-675 & SAK-756 **(Part of Grouped Option SAK-973)** 3100SC0095 Lismore/Cappoquin/Ballyduff (LCB)	Increase GW (to include commissioning new TW) abstraction from existing BH and upgrade LCB Lismore Deerpark WTP to supply deficit. New GW abstraction and upgrade WTP LCB Cappoquin WTP to partly supply deficit
SAK-677 **(Part of Grouped Option SAK-973)** 3100SC0081 Moores Well	Rationalise Lacken and Moores Well to Lismore/Cappoquin/Ballyduff (LCB) WRZ [Deerpark WTP]

WRZ Name and Option Reference	Option Description
SAK-672 **(Part of Grouped Option SAK-973)** 3100SC0024 Ballysaggart	Rationalise Ballysaggart, Monatariff and Carrognagower to Lismore/Cappoquin/Ballyduff (LCB) [Deerpark WTP]
SAK-676 **(Part of Grouped Option SAK-973)** 3100SC0113 Lacken	Rationalise Lacken and Moores Well to Lismore/Cappoquin/Ballyduff (LCB) WRZ [Deerpark WTP]
SAK-673 **(Part of Grouped Option SAK-973)** 3100SC0126 Monatarrif	Rationalise Ballysaggart, Monatariff and Carrognagower to Lismore/Cappoquin/Ballyduff (LCB) [Deerpark WTP]
SAK-674 **(Part of Grouped Option SAK-973)** 3100SC0127 Carrignagower	Rationalise Ballysaggart, Monatariff and Carrognagower to Lismore/Cappoquin/Ballyduff (LCB) [Deerpark WTP]
SAK-687 **(Part of Grouped Option SAK-975)** 2900SC0009 Two Mile Borris	Rationalise Two Mile Borris to Thurles WRZ
SAK-684 **(Part of Grouped Option SAK-975)** 2900SC0013 Horse & Jockey PWS	Rationalise Horse and Jockey to Thurles WRZ
SAK-688 **(Part of Grouped Option SAK-975)** 2900SC0014 Thurles/Borrisoleigh	Supply spare capacity to neighbouring WRZs in deficit
SAK-685 **(Part of Grouped Option SAK-975)** 2900SC0016 Littleton PWS	Rationalise Littleton to Thurles WRZ
SAK-686 **(Part of Grouped Option SAK-975)** 2900SC0029 Dundrum Regional	Interconnect Dundrum Regional and Thurles and supply deficit from Thurles
SAK-689 **(Part of Grouped Option SAK-975)**	Rationalise Glengar to Dundrum regional WRZ

WRZ Name and Option Reference	Option Description
2900SC0069 Glengar	
SAK-734 **(Part of Grouped Option SAK-983)** 2900SC0025 Clonmel & Environs	New abstraction from the River Suir and new WTP at Barnes (site identified)
SAK-735 **(Part of Grouped Option SAK-983)** 2900SC0021 Ardfinnan Regional	Interconnect Ardfinnan Regional with Clonmel WRZ and supply deficit from Clonmel [new SW abstraction from River Suir]
SAK-733 **(Part of Grouped Option SAK-983)** 2900SC0039 Templetney/Brackford Bridge PWS	Interconnect Templetney/Brackford Bridge and Clonmel WRZs and supply deficit from Clonmel (new SW from River Suir)
SAK-738 **(Part of Grouped Option SAK-983)** 2900SC0020 Ahenny	Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ [River Suir]
SAK-736 **(Part of Grouped Option SAK-983)** 2900SC0031 Tullohea	Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ [River Suir]
SAK-739 **(Part of Grouped Option SAK-983)** 2900SC0022 Ballinvir	Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ [River Suir]
SAK-737 **(Part of Grouped Option SAK-983)** 2900SC0036 Kilcash	Rationalise Tullohea, Kilcash, Ahenny and Ballinvir to Templetney/Brackford Bridge WRZ [River Suir]
SAK-740 **(Part of Grouped Option SAK-983)** 3100SC0118 Russelstown	Rationalise Russelstown to Clonmel WRZ
SAK-742 **(Part of Grouped Option SAK-983)** 3100SC0087 Glenagad	Rationalise Glennagad to Clonmel WRZ [new abstraction from the River Suir and new WTP at Barnes site]

WRZ Name and Option Reference	Option Description
SAK-741 **(Part of Grouped Option SAK-983)** 3100SC0129 Kilmanahan	Rationalise Kilmanahan to Clonmel WRZ
SAK-743 **(Part of Grouped Option SAK-983)** 3100SC0119 Poulavanogue (Waterford)	Rationalise Poulavanogue (Waterford) to Clonmel WRZ [new abstraction from the River Suir and new WTP at Barnes site]
SAK-749 **(Part of Grouped Option SAK-985c)** 1900SC0030 Kilteely	Rationalise Kilteely to Limerick City [Clareville WTP] WRZ
SAK-750 **(Part of Grouped Option SAK-985c)** 1900SC0008 Herbertstown	Rationalise Herbertstown to Limerick City [Clareville WTP] WRZ
SAK-751 **(Part of Grouped Option SAK-985c)** 1900SC0010 Knocklong/Hospital	Rationalise Knocklong/Hospital to Limerick City (Clareville WTP)
SAK-753 **(Part of Grouped Option SAK-985c)** 1900SC0011 Galbally Water Supply	Rationalise Galbally to Limerick City (Clareville WTP)
SAK-752 **(Part of Grouped Option SAK-985c)** 1900SC0012 Ballylanders Water Supply	Rationalise Ballylanders to Limerick City (Clareville WTP)
SAK-748 **(Part of Grouped Option SAK-985c)** 1900SC0038 Carrigmore	Rationalise Carrigmore to Limerick City (Clareville WTP)
SAK-356 **(Part of Grouped Option SAK-949)** 3100SC0033 East Waterford Water Supply Scheme	New SW abstraction from River Suir upstream of Carrick-on-Suir. Pump raw water to Adamstown WTP and treat at Adamstown WTP to supply deficit
SAK-495 **(Part of Grouped Option SAK-949)**	Rationalise Dunhill - Cois Coille to East Waterford WRZ [new SW abstraction from River Suir]

WRZ Name and Option Reference	Option Description
3100SC0091 Dunhill - Cois Coille	
SAK-538 **(Part of Grouped Option SAK-949)** 3100SC0092 Dunhill Ballinageeragh	Rationalise Dunhill Ballinageeragh to East Waterford WRZ [new SW abstraction from River Suir]

6.1.2 Study Area L

The Preferred Approaches for SAL with potential for LSEs on European sites are shown in Table 6.1.2.

Table 6.1.2- SAL Preferred Approaches subject to AA

WRZ Name and Option Reference	Option Description
SAL-083 **(Part of Grouped Option SAL-526)** 0100SC0009 Borris	Rationalise Borris WRZ to Gowran-Goresbridge-Paulstown WRZ
SAL-084 **(Part of Grouped Option SAL-526)** 0100SC0010 Ballinkillen	Rationalise Ballinkillen WRZ to Gowran-Goresbridge-Paulstown WRZ
SAL-015 1500SC0002 Glenmore PWS	Increase GW abstraction from Busherstown Springs and upgrade Glenmore WTP to supply deficit
SAL-085 **(Part of Grouped Option SAL-526)** 1500SC0012 Gowran-Goresbridge-Paulstown	New GW abstraction and new WTP located at Woodquater to supply full demand, and maintain existing abstraction - currently under development
SAL-078 1500SC0020 Bennettsbridge & Kilmaganny	New GW abstraction and new WTP for Bennettsbridge
SAL-073 3300SC0025 New Ross	New GW abstraction/wellfield located south of New Ross WRZ and new WTP to supply deficit
SAL-052 **(Part of Grouped Option SAL-511)** 1500SC0003 Kilkenny City	Upgrade Troyswood WTP and abandon Radestown WTP
SAL-007 **(Part of Grouped Option SAL-511)**	Rationalise Ballyragget to Kilkenny City WRZ for increased resilience and long term OPEX savings

WRZ Name and Option Reference	Option Description
1500SC0007 Ballyragget PWS	
SAL-036 **(Part of Grouped Option SAL-521)** 1500SC0013 Graiguenamanagh PWS	Rationalise Graiguenamanagh to Thomastown WRZ
SAL-039 **(Part of Grouped Option SAL-521)** 1500SC0017 Thomastown/Inistioge	New GW abstraction and upgrade Thomastown WTP to supply deficit

6.1.3 Study Area M

The Preferred Approaches for SAM with potential for LSEs on European sites are shown in Table 6.1.3.

Table 6.1.3 – SAM Preferred Approaches subject to AA

WRZ Name and Option Reference	Option Description
SAM-017 3300SC0002 Camolin WSS	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAM-029 3300SC0003 Ferns WS	New GW abstraction and new WTP to supply deficit
SAM-036 3300SC0004 Bunclody WS	New GW abstraction and upgrade Carrickduff WTP to supply deficit
SAM-044 3300SC0012 Kiltealy	Increase GW abstraction and upgrade Ballycrystal WTP to supply deficit
SAM-050 3300SC0011 Ballindaggin	Increase GW abstraction and upgrade Ballindaggin WTP to supply deficit
SAM-061 3300SC0014 Monagear	Increase GW abstraction and upgrade Monagear WTP to supply deficit
SAM-100 3300SC0013 Clonroche	New GW abstraction and upgrade Clonroche WTP to supply full demand

WRZ Name and Option Reference	Option Description
SAM-148 3300SC0078 Fardystown	New GW abstraction and upgrade Mayglass WTP to supply deficit. Bring unused BHs back to production (GW abstraction from existing BHs currently not in supply)
SAM-127 & SAM-207 3300SC0080 Sow Regional	Increase GW abstraction and upgrade WTP to partly supply deficit. New GW and new WTP to partly supply deficit
SAM-141 3400SC0045 Ballynavortha Public Supply	Increase GW abstraction and upgrade Ballinavortha WTP to supply deficit
SAM-144 3400SC0010 Coolboy Coolafancy Public Supply	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAM-146 3400SC0013 Raheengraney Public Supply	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAM-149 3300SC0081 Wexford Town	New GW wellfield at Adamstown and new WTP to supply deficit
SAM-140 **(Part of Grouped Option SAM-547)** 3400SC0053 Ballingate Public Supply	Rationalise Ballingate to Tinahely WRZ (SA1)
SAM-224 **(Part of Grouped Option SAM-575)** 3300SC0022 Carrigbyrne WS	Rationalise Carrigbyrne to South Regional WRZ
SAM-225 **(Part of Grouped Option SAM-575)** 3300SC0079 South Regional	New GW abstraction and new WTP to supply deficit
SAM-226 **(Part of Grouped Option SAM-576)** 3300SC0023 Enniscorthy Town	Increase SW abstraction from River Slaney and upgrade Vinegar Hill WTP to supply deficit
SAM-227 **(Part of Grouped Option SAM-576)** 3300SC0077	Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ

WRZ Name and Option Reference	Option Description
Bree	
SAM-228 **(Part of Grouped Option SAM-576)** 3300SC0032 Ballyhogue	Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ
SAM-229 **(Part of Grouped Option SAM-576)** 3300SC0017 Glynn WS	Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ
SAM-230 **(Part of Grouped Option SAM-576)** 3300SC0010 Marshalstown	Rationalise Bree, Ballyhogue, Glynn and Marshalstown to Enniscorthy WRZ

6.2 Appraisal of LSE leading to potential AESI

An overview of the potential impact types/pathways leading to LSEs identified as part of this NIS, and that could arise as a result of progressing the various Preferred Approaches for the SE region, and which could potentially lead to AESI in the absence of mitigation are outlined below. The European sites and their qualifying interest (QI) species or habitats potentially affected are detailed further in Appendix D (Tables D1 [SAK] – D3 [SAM]) and summarised below.

Note:

- To decipher whether “Habitat Degradation” has been considered a construction-related and/or an operation-related impact, a “C” (construction-related), “O” (operation-related) or “C&O” (both construction and operation-related) has been included in the tables in Sections 6.2.1 – 6.2.3.
- To decipher between these impacts being related to a ground or surface water abstraction, a “GW” (groundwater abstraction) or “SW” (surface water abstraction) has been included in the tables in Sections 6.2.1 – 6.2.3 if the option includes an abstraction. If the option does not include an abstraction, for example, a WTP upgrade only, then neither “GW” or “SW” has been included.

6.2.1 Study Area K

European sites identified as at risk of LSEs as a result of progressing the Preferred Approaches for SAK are shown in Table 6.2.1 while potential impact types identified for SAK are discussed below and outlined in Tables 6.2.2 – 6.2.32.

Table 6.2.1 - European sites within the ZoI of Study Area K (Waterford and South Tipperary) with LSE identified and the potential for AESI (in the absence of more detail/mitigation)

SACs	SPAs
Blackwater River (Cork/Waterford) SAC (002170)	Blackwater Callows SPA (004094)
Lower River Shannon SAC (002165)	Blackwater Estuary SPA (004028)
Lower River Suir SAC (002137)	Dungarvan Harbour SPA (004032)
Philipston Marsh SAC (001847)	Helvick Head to Ballyquin SPA (004192)
River Barrow And River Nore SAC (002162)	Mid-Waterford Coast SPA (004193)
	River Nore SPA (004233)
	River Shannon and River Fergus Estuaries SPA (004077)
	Slievefelim to Silvermines Mountains SPA (004165)
	Tramore Back Strand SPA (004027)

The Preferred Approach for SAK includes both new and increased surface and groundwater abstractions. Potential operational LSEs were identified as a result of progressing eleven Preferred Approaches associated with SAK. Four of these options include surface water abstractions (SAK-120, Group SAK-949, Group SAK-983 and Group SAK-985c). The other seven options involve groundwater abstractions (SAK-077, SAK-211, SAK-441, SAK-560 & SAK-618 combined, SAK-648, Group SAK-853 and Group SAK-973). The surface water abstractions could potentially impact on aquatic QI species including freshwater pearl mussel (*Margaritifera margaritifera*), otter (*Lutra lutra*), lamprey species, twaite shad (*Alosa fallax fallax*) and salmon (*Salmo salar*), associated with Lower River Suir SAC and/or Lower River Shannon SAC through a reduction or changes in water levels/flows (water table/availability) and or changes in water quality (habitat degradation/hydrological changes). These impacts could also affect water dependent habitats designated within SACs, such as water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation within Lower River Suir SAC and Lower River Shannon SAC. The groundwater abstractions associated with the Preferred Approach could also potentially affect groundwater dependent habitats designated within SACs, such as hydrophilous tall herb fringe communities, water courses of plain to montane levels, petrifying springs with tufa formation and alluvial forests in River Barrow and River Nore SAC, Lower River Suir SAC and/or Blackwater River (Cork/Waterford) SAC. Species that utilise groundwater dependent habitats such as Desmoulin's whorl snail (*Vertigo moulinsiana*) within River Barrow and River Nore SAC may also be impacted.

The main construction related LSEs identified were in relation to disturbance, pollution, habitat degradation with the potential for the spread of invasive species, mortality and/or physical loss of habitat associated with works adjacent to or crossing a SAC. For example, works associated with options SAK-120, SAK-211, SAK-560 & SAK-618 combined, Group SAK-837, Group SAK-853, Group SAK-949, Group SAK-975 and Group SAK-983 are within and/or adjacent to Lower River Suir SAC, and a number of these options involve new watermains crossing the SAC. These works could potentially impact freshwater pearl mussel through habitat loss, mortality, disturbance and pollution within this SAC. Other European sites that may be impacted by works being carried out within them are River Barrow And River

Nore SAC (from SAK-077), Blackwater River (Cork/Waterford) SAC (from Group SAK-973) and Lower River Shannon SAC (from Group SAK-985c).

Potential LSEs were also identified in relation to habitat degradation, disturbance and the potential for the spread of invasive species and changes in water quality during construction where European sites are hydrologically linked to or adjacent to potential works areas (e.g. Lower River Suir SAC, Blackwater River (Cork/Waterford) SAC, River Barrow And River Nore SAC, Lower River Shannon SAC, and Philipston Marsh SAC). Changes in water quality from a pollution event could impact on a number of aquatic QI species including but not limited to white-clawed crayfish (*Austropotamobius pallipes*), salmon, shad, lamprey species, freshwater pearl mussel and otter, as well as aquatic habitats including water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation (within Lower River Suir SAC, Blackwater River (Cork/Waterford) SAC, River Barrow And River Nore SAC, and Lower River Shannon SAC), and transition mires and quaking bogs (within Philipston Marsh SAC).

In addition, works within or in close proximity to Dungarvan Harbour SPA associated with Group SAK-995 could result in disturbance, habitat degradation, and/or physical loss of habitat related impacts to a number of QI bird species utilising habitats situated within the immediate hinterland of this SPA or in areas outside of the SPA but ecologically connected to it (e.g. grassland, arable farmland). Species that may be impacted include light-bellied brent goose (*Branta bernicla hrota*), lapwing (*Vanellus vanellus*), and curlew (*Numenius arquata*). Other potential LSEs were identified in relation to disturbance of QI birds and changes in water quality during construction where European sites are hydrologically linked to or adjacent to potential works area (e.g. River Nore SPA, Blackwater Callows SPA, Dungarvan Harbour SPA, Mid-Waterford Coast SPA, Helvick Head to Ballyquin SPA, Tramore Back Strand SPA, Blackwater Estuary SPA, Slievefelim to Silvermines Mountains SPA, and River Shannon and River Fergus Estuaries SPA).

Table 6.2.2 - Summary of potential LSEs from options SAK-073 and SAK-180 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)		✓ (C) (GW)			✓

Table 6.2.3 - Summary of potential LSEs from option SAK-077 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Barrow And River Nore SAC (002162)	✓	✓ (C&O) (GW)	✓	✓	✓

Table 6.2.4 - Summary of potential LSEs from option SAK-106 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)		✓ (C) (GW)			

Table 6.2.5 - Summary of potential LSEs from options SAK-120 and SAK-Group 983 (733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743) on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)	✓	✓ (C&O) (SW)	✓	✓	✓

Table 6.2.6 - Summary of potential LSEs from options SAK-211, and SAK-560 & SAK-618 combined on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)	✓	✓ (C&O) (GW)	✓	✓	✓

Table 6.2.7 - Summary of potential LSEs from option SAK-386 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Blackwater River (Cork/Waterford) SAC (002170)		✓ (C)			

Table 6.2.8 - Summary of potential LSEs from option SAK-441 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)		✓ (C&O) (GW)	✓		✓

Table 6.2.9 - Summary of potential LSEs from option SAK-444 on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Blackwater River (Cork/Waterford) SAC (002170)		✓ (C) (GW)			✓

Table 6.2.10 - Summary of potential LSEs from option SAK-477 on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Blackwater River (Cork/Waterford) SAC (002170)		✓ (C)			

Table 6.2.11 - Summary of potential LSEs from option SAK-569 on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)		✓ (C)			✓

Table 6.2.12 - Summary of potential LSEs from option SAK-648 on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)		✓ (C&O) (GW)	✓		✓
River Barrow And River Nore SAC (002162)		✓ (C) (GW)			

Table 6.2.13 - Summary of potential LSEs from option SAK-Group 837 (265, 269, 271, 273, 289) on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)		✓ (C) (GW)		✓	✓

Table 6.2.14 - Summary of potential LSEs from option SAK-Group 853 (222, 239) on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)	✓	✓ (C&O) (GW)	✓	✓	✓

River Barrow And River Nore SAC (002162)		✓ (C) (GW)			

Table 6.2.15 - Summary of potential LSEs from option SAK-Group 949 (356, 399, 438, 495, 501, 530, 538, 555, 604, 608) on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)	✓	✓ (C&O) (SW)	✓	✓	✓
River Barrow And River Nore SAC (002162)		✓ (C) (SW)			

Table 6.2.16 - Summary of potential LSEs from option SAK-Group 973 (672, 673, 674, 675, 676, 677, 756) on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Blackwater River (Cork/Waterford) SAC (002170)	✓	✓ (C&O) (GW)	✓	✓	✓

Table 6.2.17 - Summary of potential LSEs from option SAK-Group 975 (684, 685, 686, 687, 688, 689) on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Suir SAC (002137)	✓	✓ (C)		✓	✓
Lower River Shannon SAC (002165)		✓ (C)			✓
Philipston Marsh SAC (001847)		✓ (C)			

Table 6.2.18 - Summary of potential LSEs from option SAK-Group 985c (748, 749, 750, 751, 752, 753) on SACs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Lower River Shannon SAC (002165)		✓ (C&O) (SW)	✓	✓	✓
Lower River Suir SAC (002137)		✓ (C) (SW)			✓

Table 6.2.19 - Summary of potential LSEs from option SAK-077 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Nore SPA (004233)		✓ (C) (GW)			✓

Table 6.2.20 - Summary of potential LSEs from options SAK-211 and SAK-Group 983 (733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Blackwater Callows SPA (004094)					✓

Table 6.2.21 - Summary of potential LSEs from option SAK-387 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Dungarvan Harbour SPA (004032)		✓ (C)			✓

Table 6.2.22 - Summary of potential LSEs from option SAK-441 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Dungarvan Harbour SPA (004032)					✓
Blackwater Callows SPA (004094)					✓

Table 6.2.23 - Summary of potential LSEs from option SAK-450 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Dungarvan Harbour SPA (004032)					✓
Mid-Waterford Coast SPA (004193)		✓ (C) (GW)			

Table 6.2.24 - Summary of potential LSEs from option SAK-472 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Dungarvan Harbour SPA (004032)		✓ (C) (GW)			✓
Blackwater Callows SPA (004094)					✓

Table 6.2.25 - Summary of potential LSEs from option SAK-478 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Helvick Head to Ballyquin SPA (004192)		✓ (C)			✓

Table 6.2.26 - Summary of potential LSEs from option SAK-525 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Mid-Waterford Coast SPA (004193)		✓ (C)			

Table 6.2.27 - Summary of potential LSEs from option SAK-560 & SAK-618 combined on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Tramore Back Strand SPA (004027)					✓

Table 6.2.28 - Summary of potential LSEs from option SAK-Group 949 (356, 399, 438, 495, 501, 530, 538, 555, 604, 608) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Mid-Waterford Coast SPA (004193)		✓ (C) (SW)			✓
Tramore Back Strand SPA (004027)					✓
Dungarvan Harbour SPA (004032)					✓

Table 6.2.29 - Summary of potential LSEs from option SAK-Group 973 (672, 673, 674, 675, 676, 677, 756) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Blackwater Callows SPA (004094)		✓ (C) (GW)			✓
Dungarvan Harbour SPA (004032)					✓
Blackwater Estuary SPA (004028)		✓ (C) (GW)			

Table 6.2.30 - Summary of potential LSEs from option SAK-Group 975 (684, 685, 686, 687, 688, 689) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Slievefelim to Silvermines Mountains SPA (004165)					✓

Table 6.2.31 - Summary of potential LSEs from option SAK-Group 985c (748, 749, 750, 751, 752, 753) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Shannon and River Fergus Estuaries SPA (004077)		✓ (C) (SW)			✓

Table 6.2.32 - Summary of potential LSEs from option SAK-Group 995 (783, 784, 785) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Dungarvan Harbour SPA (004032)	✓	✓ (C) (GW)			✓
Mid-Waterford Coast SPA (004193)		✓ (C) (GW)			✓
Blackwater Callows SPA					✓

(004094)					

6.2.2 Study Area L

European sites identified as at risk of LSE as a result of progressing the Preferred Approaches for SAL are shown in Table 6.2.33 while potential impact types identified for SAL are discussed below and outlined in Tables 6.2.34 – 6.2.41.

Table 6.2.33 - European sites within the ZoI of Study Area L (Kilkenny) with LSEs identified and the potential for AESI (in the absence of more detail/mitigation)

SACs	SPAs
Bannow Bay SAC (000697) River Barrow And River Nore SAC (002162)	Ballyteige Burrow SPA (004020) Bannow Bay SPA (004033) River Nore SPA (004233) Wexford Harbour and Slobs SPA (004076)

The Preferred Approach for SAL includes a number of new or increased surface and groundwater abstractions. Potential operational LSEs were identified as a result of progressing three options associated with the Preferred Approach for SAL. All three of these options are associated with groundwater abstractions, SAL-015, SAL-078 and Group SAL-521. These groundwater abstractions within SAL could potentially affect the groundwater dependent habitats designated within River Barrow And River Nore SAC, including petrifying springs with tufa formation and hydrophilous tall herb fringe communities, as well as species that utilise groundwater dependent habitats such as Desmoulin's whorl snail (*Vertigo moulinsiana*).

The main construction related LSEs identified were in relation to disturbance, pollution, habitat degradation with the potential for the spread of invasive species, mortality and/or physical loss of habitat associated with works adjacent to or crossing SACs. For example, works associated with Group SAL-511 require pipeline crossings of River Barrow And River Nore SAC in an area important for the Nore pearl mussel (*Margaritifera durrovensis*). This could potentially lead to habitat loss and mortality of the species. The works associated with SAL-078, Group SAL-521 and Group SAL-526 could also lead to habitat loss within and adjacent to the same SAC.

There were also potential LSEs identified in relation to habitat degradation, disturbance, the potential for the spread of invasive species and changes in water quality during construction where European sites are hydrologically linked to or adjacent to potential works areas. The SACs that could potentially be impacted are River Barrow And River Nore SAC from options SAL-015 and SAL-073, and Bannow Bay SAC from option SAL-073. Changes in water quality from a pollution event could impact on a number of aquatic QI species including but not limited to, Nore pearl mussel, twaite shad, salmon, otter, and white-clawed crayfish.

Potential construction related LSEs were identified for four SPAs. Works adjacent to or in close proximity to the River Nore SPA (associated with Group SAL-511), could result in disturbance, habitat degradation, mortality and/or physical loss of habitat related impacts to kingfisher utilising habitats situated within this SPA or in areas outside of the SPA but ecologically connected to it. There may be disturbance and/or habitat degradation related impacts to a number of QI bird species utilising habitats

situated within the immediate hinterland of SPAs or in areas outside of a SPA but ecologically connected to it (e.g. grassland, arable farmland). There may also be disturbance of QI birds and changes in water quality during construction where European sites are hydrologically linked to or adjacent to potential works area. The SPAs potentially affected by works within the SAL Preferred Approach include Wexford Harbour and Slobs SPA, Bannow Bay SPA, Ballyteige Burrow SPA (all from option SAL-073), and River Nore SPA (from options SAL-078, Group SAL-511 and Group SAL-521). Species that may be impacted include light-bellied Brent goose (*Branta bernicla hrota*), Greenland white-fronted goose (*Anser albifrons flavirostris*), whooper swan (*Cygnus cygnus*) and various waterbird species.

Table 6.2.34 - Summary of potential LSEs from option SAL-015 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Barrow And River Nore SAC (002162)		✓ (C&O) (GW)	✓		✓

Table 6.2.35 - Summary of potential LSEs from option SAL-073 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Barrow And River Nore SAC (002162)		✓ (C) (GW)			✓
Bannow Bay SAC (000697)		✓ (C) (GW)			

Table 6.2.36 - Summary of potential LSEs from options SAL-078 and SAL-Group 521 (036, 039) on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Barrow And River Nore SAC (002162)	✓	✓ (C&O) (GW)	✓	✓	✓

Table 6.2.37 - Summary of potential LSEs from option SAL-Group 511 (007, 052) on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Barrow And River Nore SAC (002162)	✓	✓ (C) (SW)		✓	✓

Table 6.2.38 - Summary of potential LSEs from option SAL-Group 526 (083, 084, 085) on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Barrow And River Nore SAC (002162)	✓	✓ (C) (GW)		✓	✓

Table 6.2.39 - Summary of potential LSEs from option SAL-073 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Wexford Harbour and Slobs SPA (004076)					✓
Bannow Bay SPA (004033)		✓ (C) (GW)			✓
Ballyteige Burrow SPA (004020)					✓

Table 6.2.40 - Summary of potential LSEs from options SAL-078 and SAL-Group 521 (036, 039) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Nore SPA (004233)		✓ (C) (GW)			✓

Table 6.2.41 - Summary of potential LSEs from option SAL-Group 511 (007, 052) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
River Nore SPA (004233)	✓	✓		✓	✓

		(C) (SW)			

6.2.3 Study Area M

European sites identified with potential for LSEs as a result of progressing the Preferred Approaches for SAM are shown in Table 6.2.42 while potential impact pathways identified for SAM and discussed below and outlined in Tables 6.2.43 – 6.2.64.

Table 6.2.42 - European sites within the ZoI of Study Area M (Wexford and Wicklow) with LSE identified and the potential for AESI (in the absence of more detail/mitigation)

SACs	SPAs
Ballyteige Burrow SAC (00696)	Ballyteige Burrow SPA (004020)
Bannow Bay SAC (000697)	Bannow Bay SPA (004033)
Screen Hills SAC (000708)	Cahore Marshes SPA (004143)
Slaney River Valley SAC (000781)	Tacumshin Lake SPA (004092)
	The Raven SPA (004019)
	Tramore Back Strand SPA (004027)
	Wexford Harbour and Slobs SPA (004076)

The Preferred Approach for SAM includes both new and increased groundwater abstractions as well as an increased surface water abstraction. Potential operational LSEs were identified as a result of progressing two options associated with the Preferred Approach for SAM. Both of these options are associated with new groundwater abstractions (SAM-029 and SAM-036). These abstractions could potentially impact on groundwater dependent habitats designated within Slaney River Valley SAC through a reduction or changes in water levels/flows (water table/availability) and or changes in water quality (habitat degradation/hydrological changes). The habitats that may be impacted include water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation, and alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion*, *Alnion incanae*, *Salicion albae*).

The main construction related LSEs identified were in relation to disturbance, pollution, habitat degradation with the potential for the spread of invasive species, mortality and/or physical loss of habitat associated with works within, adjacent to or crossing a SAC. These impacts were associated with two options within the SAM Preferred Approach. One option, SAM-036, involves works that require a pipeline crossing of Slaney River Valley SAC, while the other option, Group SAM-576, involves works within and adjacent to River Slaney SAC.

Potential LSEs were also identified in relation to habitat degradation, disturbance and the potential for the spread of invasive species and changes in water quality during construction where European sites are hydrologically linked to or adjacent to potential works areas (e.g. Ballyteigue Burrow SAC, Bannow Bay SAC, Screen Hills SAC and Slaney River Valley SAC). Changes in water quality from a pollution event could impact on a number of aquatic habitats including water courses of plain to montane levels, oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*), estuaries, and

coastal lagoons associated with the four previously mentioned SACs, as well as aquatic QI such as freshwater pearl mussel, lamprey species, twaite shad, otter and salmon within Slaney River Valley SAC.

Works in close proximity to Wexford Harbour and Slobs SPA associated with Group SAM-576 could result in disturbance, habitat degradation, and/or physical loss of habitat related impacts to a number of QI bird species utilising habitats situated within the immediate hinterland of this SPA or in areas outside of the SPA but ecologically connected to it (e.g. grassland, arable farmland). There may also be disturbance and/or habitat degradation related impacts to a number of QI bird species utilising habitats situated within the immediate hinterland of SPAs or in areas outside of a SPA but ecologically connected to it (e.g. grassland, arable farmland) due to the works associated with other options within the SAM Preferred Approach. Other potential LSEs were identified in relation to disturbance of QI birds and changes in water quality during construction where the SPAs were hydrologically linked to or adjacent to potential works areas. The SPAs potentially affected by works within the SAM Preferred Approach include Ballyteige Burrow SPA, Bannow Bay SPA, Cahore Marshes SPA, Tacumshin Lake SPA, The Raven SPA, Tramore Back Strand SPA, and Wexford Harbour and Slobs SPA. Species that may be impacted include Bewick's swan (*Cygnus columbianus bewickii*), whooper swan, Greenland white-fronted goose, light-bellied brent goose, and various wader and duck species.

Table 6.2.43 - Summary of potential LSEs from option SAM-029 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Slaney River Valley SAC (000781)		✓ (C&O) (GW)	✓		✓

Table 6.2.44 - Summary of potential LSEs from option SAM-036 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Slaney River Valley SAC (000781)	✓	✓ (C&O) (GW)	✓	✓	✓

Table 6.2.45 - Summary of potential LSEs from options SAM-044, SAM-050, SAM-100 and SAM-141 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Slaney River Valley SAC (000781)		✓ (C) (GW)			

Table 6.2.46 - Summary of potential LSEs from option SAM-061 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Slaney River Valley SAC (000781)		✓ (C) (GW)			✓

Table 6.2.47 - Summary of potential LSEs from options SAM-127 & SAM-207 combined on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Screen Hills SAC (000708)		✓ (C) (GW)			
Slaney River Valley SAC (000781)		✓ (C) (GW)			✓

Table 6.2.48 - Summary of potential LSEs from option SAM-144 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Slaney River Valley SAC (000781)		✓ (C)			

Table 6.2.49 - Summary of potential LSEs from options SAM-146 and SAM-Group 547 (140) on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Slaney River Valley SAC (000781)		✓ (C)			✓

Table 6.2.50 - Summary of potential LSEs from option SAM-148 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Ballyteige Burrow SAC (00696)		✓ (C) (GW)			

Table 6.2.51 - Summary of potential LSEs from option SAM-149 on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Slaney River Valley SAC (000781)					✓
Bannow Bay SAC (000697)		✓ (C) (GW)			
Ballyteige Burrow SAC (00696)		✓ (C) (GW)			

Table 6.2.52 - Summary of potential LSEs from option SAM-Group 575 (224, 225) on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Bannow Bay SAC (000697)		✓ (C) (GW)			

Table 6.2.53 - Summary of potential LSEs from option SAM-Group 576 (226, 227, 228, 229, 230) on SACs with the potential to give rise to AESI

SAC	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Slaney River Valley SAC (000781)	✓	✓ (C) (SW)		✓	✓

Table 6.2.54 - Summary of potential LSEs from option SAM-017 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Cahore Marshes SPA (004143)					✓
Wexford Harbour and Slobs SPA (004076)					✓

Table 6.2.55 - Summary of potential LSEs from option SAM-029 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Wexford Harbour and Slobs SPA (004076)		✓ (C) (GW)			✓
Cahore Marshes SPA (004143)					✓

Table 6.2.56 - Summary of potential LSEs from option SAM-036 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Wexford Harbour and Slobs SPA (004076)					✓

Table 6.2.57 - Summary of potential LSEs from options SAM-044 and SAM-050 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Wexford Harbour and Slobs SPA (004076)		✓ (C) (GW)			✓

Table 6.2.58 - Summary of potential LSEs from option SAM-061 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Wexford Harbour and Slobs SPA (004076)		✓ (C) (GW)			✓
The Raven SPA (004019)					✓
Cahore Marshes SPA (004143)					✓

Table 6.2.59 - Summary of potential LSEs from options SAM-100 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Wexford Harbour and Slobs SPA (004076)		✓ (C) (GW)			✓
Bannow Bay SPA (004033)					✓

Table 6.2.60 - Summary of potential LSEs from options SAM-127 & SAM-207 combined on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Wexford Harbour and Slobs SPA (004076)		✓ (C) (GW)			✓
The Raven SPA (004019)		✓ (C) (GW)			✓
Cahore Marshes SPA (004143)					✓

Table 6.2.61 - Summary of potential LSEs from option SAM-148 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Tacumshin Lake SPA					✓

(004092)					
Wexford Harbour and Slobs SPA (004076)					✓
Ballyteige Burrow SPA (004020)		✓ (C) (GW)			✓
The Raven SPA (004019)					✓
Bannow Bay SPA (004033)					✓

Table 6.2.62 - Summary of potential LSEs from option SAM-149 on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Wexford Harbour and Slobs SPA (004076)					✓
The Raven SPA (004019)					✓
Bannow Bay SPA (004033)		✓ (C) (GW)			✓
Ballyteige Burrow SPA (004020)		✓ (C) (GW)			✓
Tacumshin Lake SPA (004092)					✓

Table 6.2.63 - Summary of potential LSEs from option SAM-Group 575 (224, 225) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Bannow Bay SPA (004033)		✓ (C) (GW)			✓
Ballyteige Burrow SPA (004020)					✓
Wexford Harbour and Slobs SPA (004076)					✓
Tramore Back Strand SPA (004027)					✓

Table 6.2.64 - Summary of potential LSEs from option SAM-Group 576 (226, 227, 228, 229, 230) on SPAs with the potential to give rise to AESI

SPA	Habitat Loss (including supporting habitat outside designated sites)	Habitat degradation (impacts to water quality and hydrological/ hydrogeological changes etc.)	Water table/ availability	Mortality	Disturbance (incl. spread of non-native invasive species)
Wexford Harbour and Slobs SPA (004076)	✓	✓ (C) (SW)			✓
The Raven SPA (004019)		✓ (C) (SW)			✓
Bannow Bay SPA (004033)					✓
Ballyteige Burrow SPA (004020)					✓
Tacumshin Lake SPA (004092)					✓

6.3 Mitigation

6.3.1 Protection of European Sites in Plan Development

Set out in Chapter 2.5 of this report are a number of measures employed to ensure the protection of European sites in the Plan development process, while mitigation measures specific to the option types arising from the Preferred Approach for the SE region are detailed below.

6.3.2 Avoidance

The setting of sustainable abstraction limits (as outlined in Chapter 2.5.1) for any new or increased abstractions arising as a result of the RWRP-SE is intended to ensure impacts on aquatic QI species and habitats requiring high status water quality are avoided.

The Option Assessment Methodology has aimed to identify options that avoid or minimise impacts on European sites (as outlined in Chapter 2.5.3). The Best AA approach gives maximum consideration to those options with no potential for impacts on European Sites or options with LSEs that can be addressed with general/standard mitigation measures at the project level (based on desktop study). It puts avoidance of impacts on European sites at the forefront of the assessment taking account for the fact that options with a high likelihood of having adverse effects on a European site have already been removed at Coarse Screening stage. Taking this approach any Feasible Option that meets the objectives of the Plan and scores neutral or zero against the European Sites (Biodiversity) question is automatically selected as the Preferred Approach (this is in line with the provisions of Article 6(3) of the Habitats Directive to ensure the protection of European Sites).

As outlined in Section 2.5.4. no option arising from the Plan with the potential for AESI identified at project level will be progressed as the Plan will have identified other options that could be progressed at the project level if required. Such protective measures have been built into the Plan to ensure AESI are avoided as a result of adopting the RWRP-SE.

6.3.3 General Mitigation Measures and Principles

6.3.3.1 Overview

The various measures that may be applied to options include:

- **General Measures** (established construction best-practice, etc.) which will be applied to all options;
- **Option-specific Measures** (established and reliable measures identified to avoid specific potential effects on European sites, in particular for highly sensitive species incl. freshwater pearl mussel); and
- **Further assessments and data.**

These measures will be applied unless project-level AAs or project-specific environmental assessments demonstrate that they are not required (i.e. the predicted effect will not occur), not appropriate, or that alternative or additional measures are necessary or more appropriate.

Note that these measures are not exhaustive or exclusive and must be reviewed at the project stage, taking into consideration any changes in best-practice as well as project-specific survey information or studies.

As part of the feedback loop described in Figure 1.3 and Figure 1.4, during the project stage all options will be reassessed and monitored. Options will not be progressed if impacts to European sites cannot be mitigated against or if the mitigation measures are not effective. The results of monitoring will then

feedback into the project development and the future plan cycle to ensure the targets can be met without impacts to European sites.

6.3.3.2 General Mitigation Measures

Scheme Design and Planning

All options will be subject to project-level environmental assessment as and when they are brought forward, which will include assessments of their potential to affect European sites during their construction or operation. These assessments will consider or identify (*inter alia*):

- potential for avoiding effects on European sites through design (e.g. alternative pipeline routes; micro siting; etc);
- best practice construction measures that need to be incorporated into scheme design and/or planning to avoid or mitigate potential effects, for example, ensuring that sufficient working area is available for pollution prevention measures to be installed, such as sediment traps; and
- operational regimes required to ensure no adverse effects occur (e.g. compensation flow releases or reduced abstraction rates [seasonal restrictions]. **Note:** these measures could only be identified through detailed site assessments and agreed through the abstraction licensing process when in place).

Uisce Éireann will implement the objectives of their Biodiversity Action Plan (Uisce Éireann, 2021). Where appropriate this would include measures to ensure “no net loss” of biodiversity across Uisce Éireann sites when carrying out activities, delivering plans for example, or promote the use of nature-based solutions for water protection and wastewater treatment or manage invasive alien species on Uisce Éireann sites to increase biodiversity on their sites.

Pollution Prevention

Best practice construction methods will be applicable to all of the proposed options and can be relied on (at this level) to prevent significant or adverse effects on a European site occurring as a result of construction related impacts (e.g. pollutants). Pollution control measures will be detailed in project specific construction and environmental management plans. The following guidance documents detail the current industry best-practices in construction that are likely to be relevant to all options:

- Guidelines on Protection of Fisheries during Construction Works in and Adjacent to Waters; and
- Guidelines for the Crossing of Watercourses During the Construction of National Road Schemes[15]

Construction Industry Research and Information Association (CIRIA) guidance:

- CIRIA C532: Control of Water Pollution from Construction Sites, Guidance for Consultants and Contractors;
- CIRIA C741: Environmental Good Practice on Site Guide (4th edition);
- CIRIA C648: Control of Water Pollution from Linear Construction Projects: Technical Guidance; and
- CIRIA C649: Control of water pollution from linear construction projects: Site guide.

The best-practice procedures and measures detailed in these documents will be followed for all construction works arising from the RWRP-SE as a minimum standard, unless project-specific

[15] https://www.tii.ie/tii-library/environment/construction-guidelines/Guidelines-for-the-Crossing-of-Watercourses-during-the-Construction-of-National-Road-Schemes.pdf (Accessed, November 2023)

investigations identify additional measures and/or more appropriate non-standard approaches for dealing with potential site-derived pollutants.

General measures for species and habitats

Most species-specific avoidance or mitigation measures can only be determined at the project level, following detailed project-specific surveys. Detailed species-specific mitigation measures will vary according to a range of factors that cannot be determined at the strategic RWRP-SE level. In addition, some general 'best-practice' measures may not be appropriate to the QI of the European sites concerned (for example, clearing vegetation in winter is usually proposed to avoid impacts on nesting birds; however, this is unlikely to be necessary to avoid effects on some SPA species (such as overwintering estuarine birds) and the removal of vegetation in winter might actually have a negative effect on these species through disturbance). However, the following general measures will be followed to minimise the potential for impacts on QI species unless project level environmental assessments or project level AA indicate that they are not required or not appropriate, or that alternative or additional measures are more appropriate/necessary:

Works programme: The works programme and requirements for each option will be determined at the earliest opportunity to allow surveys and mitigation to be appropriately scheduled and to provide sufficient time for consultations with bodies such as the National Parks and Wildlife Service (NPWS), Environmental Protection Agency (EPA) and Inland Fisheries Ireland (IFI).

Scheme design: Will aim to minimise the environmental effects by 'designing to avoid' potential impacts.

Use less: Will aim to minimise environmental effects through water efficiency measures, for example, reducing water wastage.

Habitat Loss and Supporting Habitats Loss: Pipelines are usually (where practical) constructed within existing public roads, therefore limiting or avoiding the potential for habitat loss within European sites. Where possible all new infrastructure such as WTPs will be sited outside of European sites. Where preferred approach options are within or hydrologically/hydrogeologically linked to European sites, detailed surveys of habitats within the affected area will be undertaken to locate and avoid sensitive habitats to ensure there is no loss of QI Annex I habitats or Annex II species, such as slender naiad for example. Similarly, any upgrade of existing infrastructure within or adjacent to European sites will aim to avoid impacts on these species or habitats through appropriate scheme design.

Habitat features that may be used by QI species (supporting habitat) when outside the European site boundary will be avoided through project specific studies and appropriate scheme design. Surveys focusing on mobile QI species will ensure any significant areas of supporting habitat (for example, foraging areas for QI birds very near but outside of an SPA, otter holts outside an SAC boundary) will be identified and avoided or appropriate mitigation measures put in place to protect them.

Invasive Species: There is the potential for both terrestrial and aquatic non-native invasive species to be present across the country. If present, these could potentially be spread to habitats within SACs/SPAs during construction works/operation (for example, maintenance works to WTPs and pipelines). The introduction of invasive species into a European site can affect the conservation objectives for QI habitats or species, potentially adversely affecting the integrity of the European site (for example, affecting vegetation composition of an Annex I QI habitat, affecting species distribution and abundance and/or out-competing native species). Invasive species surveys (for species listed on Schedule 3 of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of

2011) will be undertaken for any future projects that may arise from the RWRP-SE. If invasive species are found to be present, an Invasive Species Management Plan will be prepared to outline the control and or removal measures. These measures will ensure such species are not spread during construction or operation of any future projects that may arise from option types outlined within the RWRP-SE. All works relating to invasive species will be implemented in line with relevant national guidelines as well as those relevant guidelines produced by Uisce Éireann (Uisce Éireann, n.d. a-e) including:

- Biosecurity protocols in relation to water quality and biological sampling.
- Invasive Species Management Guidelines for Japanese knotweed (*Reynoutria japonica*), Himalayan balsam (*Impatiens glandulifera*) and giant hogweed (*Heracleum mantegazzianum*).

Pre-construction Surveys/Seasonal Restrictions/Ecological Clerk of Works: To ensure appropriate protection of QI habitats and species, pre-construction surveys will be undertaken for all future projects (where required). Additionally, the implementation of seasonal working restrictions may be required. Furthermore, works in sensitive areas will be supervised by an experienced ecologist/Ecological Clerk of Works with appropriate qualifications to manage the risks associated with the specific conservation interests of the affected European Site.

6.3.4 Option Specific Measures

The plan-level assessment has identified option specific mitigation measures for a small number of options with highly sensitive QI species (e.g. freshwater pearl mussel) as outlined in Table 6.3.1 below.

Table 6.3.1 - Option specific mitigation measures

Study Area/Option	European Site	QI Features	Mitigation Measure (in addition to General Mitigation Measures.
SAK (Options SAK-120, SAK-211, SAK-560 & SAK-618 combined, SAK-949, SAK-973, SAK-975, SAK-983)	Lower River Suir SAC Blackwater River (Cork/Waterford) SAC	Salmon/ Freshwater pearl mussel (FWPM)	The pipelines associated with these options will cross these European sites. For SAC river crossings it is assumed that the least impactful solution will always be employed, for example, directional drilling beneath the river rather than open cut. *Note it is not anticipated that there would be any direct impacts on FWPM, as such impacts could be designed out through, for example, strategic positioning of crossing points. Only indirect effects are anticipated for FWPM through potential impacts on their host species. The potential for direct impacts can only be determined at the project stage which will influence the location for any crossing points.* Construction works (pipeline crossing of SAC) will avoid the main migration and spawning periods for salmon (this period is also critical to the lifecycle of the freshwater pearl mussel) to minimise the risk of displacement or barrier effects due to noise, vibration or site-derived pollutants, unless project-specific environmental assessments identify that any effects associated with construction works will be 'not significant' or will have no adverse effect on the integrity of the SAC. To note there are significant variations in the timing and duration of salmonid spawning activity

Study Area/Option	European Site	QI Features	Mitigation Measure (in addition to General Mitigation Measures.
			throughout the Republic of Ireland (IFI, 2016). Instream works should be carried out during the period July-September (except in exceptional circumstances and with agreement with IFI).
SAL (Options SAL-511, SAL-526)	River Barrow And River Nore SAC	Salmon/Freshwater pearl mussel (FWPM)/Nore pearl mussel	The pipelines associated with these options will cross this European site. For SAC river crossings it is assumed that the least impactful solution will always be employed, for example, directional drilling beneath the river rather than open cut. *Note it is not anticipated that there would be any direct impacts on FWPM or Nore pearl mussel, as such impacts could be designed out through, for example, strategic positioning of crossing points. Only indirect effects are anticipated for FWPM and/or Nore pearl mussel through potential impacts on their host species. The potential for direct impacts can only be determined at the project stage which will influence the location for any crossing points.* Construction works (pipeline crossing of SAC) will avoid the main migration and spawning periods for salmon (this period is also critical to the lifecycle of the freshwater pearl mussel and Nore pearl mussel) to minimise the risk of displacement or barrier effects due to noise, vibration or site-derived pollutants, unless project-specific environmental assessments identify that any effects associated with construction works will be 'not significant' or will have no adverse effect on the integrity of the SAC. To note there are significant variations in the timing and duration of salmonid spawning activity throughout the Republic of Ireland (IFI, 2016). Instream works should be carried out during the period July-September (except in exceptional circumstances and with agreement with IFI).
SAM (Option SAM-036)	Slaney River Valley SAC	Salmon/ Freshwater pearl mussel (FWPM)	The pipelines associated with this option will cross this European site. For SAC river crossings it is assumed that the least impactful solution will always be employed, for example, directional drilling beneath the river rather than open cut. *Note it is not anticipated that there would be any direct impacts on FWPM, as such impacts could be designed out through, for example, strategic positioning of crossing points. Only indirect effects are anticipated for FWPM through potential impacts on their host species. The potential for direct impacts can only be*

Study Area/Option	European Site	QI Features	Mitigation Measure (in addition to General Mitigation Measures.
			determined at the project stage which will influence the location for any crossing points. Construction works (pipeline crossing of SAC) will avoid the main migration and spawning periods for salmon (this period is also critical to the lifecycle of the freshwater pearl mussel) to minimise the risk of displacement or barrier effects due to noise, vibration or site-derived pollutants, unless project-specific environmental assessments identify that any effects associated with construction works will be 'not significant' or will have no adverse effect on the integrity of the SAC. To note there are significant variations in the timing and duration of salmonid spawning activity throughout the Republic of Ireland (IFI, 2016). Instream works should be carried out during the period July-September (except in exceptional circumstances and with agreement with IFI).

6.3.5 Further assessments and data to inform potential impacts

As discussed in Chapter 2.5 the management option types could have an effect on European sites and their water dependent QI species or habitats. Applying sustainable abstraction limits of 10% and 5% of Q95 or Q50 as appropriate will provide protection for European sites. However, as with all management option types arising from the Plan further assessments will be required at the project level to ensure the most robust data is used to inform any environmental assessment in support of planning applications/abstraction licences etc.

Further detailed site-specific hydrological assessments will be required for a number of the options relating to new or increased ground or surface water abstractions. These will be required to fully understand the potential impacts (if any) on European sites. These further assessments are particularly important for new groundwater abstractions where there is very limited information or knowledge on sustainable abstraction limits or potential zones of contribution (the area over which effects may occur). Outlined below are some of the assessments that may be required at the project level.

Potential effects include, but are not limited to, changes in water quality and/or water levels, habitat loss and disturbance. Prior to progressing any new management option, the following assessments will be required:

- **Measure 6.3.5a: Yield assessment:** This assessment will identify the amount of water that can be sustainably abstracted from a given waterbody, taking account of, for example, low flows and climate change. This data will be interpreted alongside field data on the QI(s) in question.
- **Measure 6.3.5b: Hydrological modelling:** This will indicate what change in water levels would result from a given abstraction. This data would need to be interpreted alongside field data on the QI(s) in question (for example fish habitat assessment undertaken at low flows). Modelling may also include potential changes in salinity associated with desalination plants.
- **Measure 6.3.5c: Hydrogeological modelling:** This will indicate the distribution and movement of groundwater sources. This data will need to be interpreted alongside field data on the QI(s) in

question (for example. how the groundwater abstraction may interact with groundwater dependent QI habitats or species).

- **Measure 6.3.5d: Examining lake/groundwater catchment (for abstractions):** To determine if the lake is a hydraulic sink or part of groundwater flow-through systems or linked to surrounding GWDTHs.

Note that this list of assessment is non-exhaustive and must be reviewed at the project stage, taking into account project-specific survey information or studies.

6.4 Conclusion to AESI

Appendix D (see Tables D1 [SAK] – D3 [SAM]) summarises the potential impacts to European sites and the corresponding mitigation measures to ensure any potential adverse effects on site integrity are avoided as a result of progressing the Preferred Approach for the SE region. Mitigation measures are referenced in Appendix D but detailed in Section 6.3 above.

7 In-combination Effects

7.1 Assessment of In-combination Effects

Under Article 6(3) of the Habitats Directive, an assessment of 'in-combination' effects with other plans and projects is required. The assessment used the best available information at the time of writing.

The assessment of in-combination effects focused on potential effects between options and effects between options and other major projects or plans. Table 7.1 presents the in-combination assessment for RWRP-SE with other plans. The assessment is undertaken at the regional level. The in-combination assessment for projects and between SAs is detailed in Appendix E (see Tables E1 [SAK] – E3 [SAM] and E4 [SE region]), the in-combination assessment between regional groups is detailed in Appendix E (see Table E5 [SE, NW, SW and EM region]), and all are summarised in Table 7.2 below.

In summary potential in-combination effects with other plans, projects, between options and between regional groups were identified. However, with the implementation of mitigation there will be no adverse effects on the integrity of any European site, either alone or in-combination with other plans or projects as a result of implementing the RWRP-SE.

As noted previously, at the project level further detailed assessment of potential in-combination effects in relation to surface or groundwater abstractions will be required and appropriate measures to avoid in-combination effects will be identified at that stage.

Table 7.1 - Summary of in-combination assessment with other plans

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
Uisce Éireann Plans [RWRP-EM, RWRP-SW and RWRP-NW not included in Table 7.1 as they are assessed in more detail in Table 7.2 below]				
Water Services Strategic Plan (WSSP)[16] The WSSP is the highest tier Uisce Éireann asset management plan. It sets the overarching framework for detailed Implementation Plans including the Framework Plan and specific water services projects over the next 25 years.	• Habitat loss and disturbance from new/upgraded infrastructure • Species disturbance/ mortality • Changes to water quality or quantity	Y	A screening for AA[17] was undertaken for the WSSP which concluded that there was potential for significant effects on European sites from the implementation of the plan. The WSSP is the highest tier (Tier 1) Uisce Éireann asset management plan. The WSSP is a high level plan with no location-specific information. The AA screening for both the WSSP and the RWRP-SE identify potential LSEs from impacts of a similar nature, and therefore a potential for in-combination effects was identified. The NIS for the WSSP highlighted the need for additional plan/project environmental assessments to be carried out at the Tier 2 and Tier 3 level. Page xii of the WSSP sets out a summary of the strategic objectives and aims of the plan. In particular, Chapter 6 presents overarching strategies (EN1 to EN3) that aim to protect and enhance the environment. Strategy EN2 is of particular relevance: *"Operate our water services infrastructure in a manner that supports the achievement of water body objectives under the Water Framework Directive and our obligations under the Birds and Habitats Directives"…"projects are designed and developed in accordance with statutory planning processes and environmental regulations from the outset. We will comply with the statutory processes relevant to our programmes and projects, including Strategic Environmental Assessment (SEA), Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) under the Habitats Directive, ensuring the avoidance of potential significant adverse effects on biodiversity (including protected sites), human health, water, air quality, cultural heritage (including archaeology), soil and landscape and visual amenity as a result of the upgrade*	N

[16] https://www.water.ie/docs/WSSP_Final.pdf (Accessed, November 2023)
[17] https://www.water.ie/docs/WSSP-AA-Natura-Impact-Statement-(Web).pdf (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
			to/construction of new infrastructure, including potential transboundary effects". The NIS for the RWRP-SE has highlighted the need for additional project level environmental assessments, while high-level mitigation measures have been outlined in Chapter 6 of this NIS. Mitigation required will be developed and delivered as options are advanced which will protect European sites within the SE region from in-combination effects that could lead to AESI. Given the overarching strategies and objectives within the WSSP to protect the environment, and with the implementation of mitigation measures, including project level AA, no AESI in light of European sites' conservation objectives are predicted as a result of in-combination effects.	
National Wastewater Sludge Management Plan (NWSMP) 2016-2021[18] The NWSMP is a Tier 2 plan which sets out the long-term strategy for the management of wastewater sludge produced at Waste WTPs under the control of Uisce Éireann. This is currently the most recent NWSMP.	• Habitat loss and disturbance from new/upgraded infrastructure • Changes in water quality (increased phosphorous in receiving waters) • Loss of or disturbance to habitats or species or their supporting features, for example water quality through inappropriate siting of new infrastructure.	Y	The AA screening for the NWSMP concluded that the NWSMP could lead to significant effects on European sites. This is a high level (Tier 2) plan with no location-specific information. However, the AA screenings for both the NWSMP and the RWRP-SE identify potential LSEs from impacts of a similar nature, and therefore a potential for in-combination effects has been identified. For example, siting of new wastewater sludge infrastructure has the potential to impact the same receptors as new infrastructure under the RWRP-SE. A number of mitigation measures have been outlined in Table 6-1 of the NIS for the NWSMP which includes a number of policies, actions and research initiatives which all aim to protect the environment, including European sites. Given the mitigation measures set out in the NIS for the NWSMP and the mitigation measures in Chapter 6 of this NIS, and with the requirement for project level assessments for any project arising from the plans, no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[18] https://www.water.ie/iw-documents/our-projects/Final-NWSMP.pdf (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
Lead in Drinking Water Mitigation Plan (LDWMP)[19] In 2015, the Government published the National Strategy with the aim to ensure the protection of human health and achieve a solution to the issue of lead in drinking water. As the national public water utility, Uisce Éireann developed the Lead in Drinking Water Mitigation Plan in order to address the risk of failure to comply with the drinking water quality standard for lead due to lead pipework serving properties connected to the public water network. The plan identified that Orthophosphate treatment would be required at the Water Supply Zone where lead replacement is not	• Changes to water quality • Increased phosphorous in receiving waters leading to nutrient enrichment and proliferation of plant growth (eutrophication)	Y	The AA screening for the LDWMP concluded that the LDWMP could lead to significant effects on European sites. This is a high level (Tier 2) plan with no location-specific information. Both the LDWMP and the RWRP-SE identify potential LSEs from impacts of a similar nature, and therefore a potential for in-combination effects has been identified. An AA Determination is available for this Plan[20]. As part of the LDWMP, Uisce Éireann developed a model to facilitate specific environmental risk assessment of any proposed orthophosphate treatment and provide a methodology to determine the risk to the receiving environment of this corrective water treatment. Mitigation measures have been outlined in Chapter 7 of the NIS for the LDWMP and states that, "*Where the EAM (Environmental Assessment Methodology) and NIS (if required) indicate an adverse effect on European site integrity in view of the site's conservation objectives, orthophosphate treatment will not be applied*". Given the mitigation measures set out in Chapter 7 of the NIS for the LDWMP and the mitigation measures in Chapter 6 of this NIS, and with the requirement for project level assessments for any project arising from the plans, no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[19] https://www.water.ie/docs/Lead-in-Drinking-Water-Mitigation-Plan.pdf (Accessed, November 2023)
[20] https://www.water.ie/docs/Lead_AA-Determination.pdf (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
feasible.				
Other relevant Plans				
National Planning Framework (NPF)[21] The purpose of the long-term strategy is to provide a framework for the growth of Ireland's cities and towns over the next 20 years in an environmentally sustainable way. It is envisaged that the NPF will be detailed in Regional Spatial and Economic Strategies to ensure proper planning and sustainable development in the long term, at local, regional and national levels.	• Loss of habitat • Changes to hydrology/ water quality • Disturbance/ disruption resulting in a reduction of key specie/species density during construction and operation • Invasive species introduction	Y	The NPF, including a Strategic Flood Risk Assessment, was subject to screening for AA. The screening was undertaken at an early stage of plan development, which promotes sustainable development, and considers European sites. For example, National Planning Objective (NPO) 59 centres on the enhancement and conservation of European sites. Potential LSEs were identified from land use change from development and an increase in jobs and associated work force. The NPF identified that a key priority is *"Ensuring that water supply and waste-water needs are met by new national projects".* The conclusion of the screening for AA was that, given the uncertainty as to what the policy objectives may include, the potential for LSEs could not be ruled out and a Stage 2 AA was undertaken[22]. Therefore, there is potential for in-combination effects from the NPF and the RWRP-SE. The NPF is a strategic plan which sets the framework for, and relies to a significant degree on, other policy, strategy and plan initiatives to achieve its objectives. These other plans have been or will be subject to AA and will have identified mitigation measures to ensure no AESI. The measures committed to in these other plans will be essential to ensuring that the objectives of the NPF are met and that the NPF does not have adverse effects on any European site. Given the mitigation measures set out in Chapter 7, Table 7-1 of the NPF NIS and Chapter 6 of this NIS, and with the requirement for project level assessments for any project arising from the plans, no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[21] http://npf.ie/wp-content/uploads/Project-Ireland-2040-NPF.pdf (Accessed, November 2023)
[22] http://npf.ie/wp-content/uploads/2017/09/Natura-Impact-Statement-%E2%80%93-Ireland-2040.pdf (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
Regional Spatial and Economic Strategies The Regional Spatial and Economic Strategies is a policy document which seeks to focus future growth patterns through a strategic planning framework as required under the NPF. Each of the Regional Assemblies has a role to play in identifying regional policies and coordinating initiatives that support the delivery and implementation of national planning policy. The regions are as follows: • Northern and Western Region[23]; • Eastern and Midland Region[24]; and • Southern Region[25]. Regions are connected through hydrological	• Loss of habitat • Provision of new/upgraded infrastructure • Changes to hydrology • Changes in water quality • Disturbance to species • Species mortality	Y	All Regional Spatial and Economic Guidelines are subject to screening for AA. By their very nature, such plans will promote sustainable development which also feeds into the NPF, including the provision of sustainable and clean water sources. However, there is potential for in-combination effects with the RWRP-SE. As with all projects arising from the RWRP-SE, all projects arising from Regional Spatial and Economic Strategies will be subject to project level assessments. Given the mitigation measures set out in Chapter 6 of this NIS, and with the requirement for project level assessments for any project arising from the plans, no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[23] https://www.nwra.ie/rses/ (Accessed, November 2023)
[24] https://emra.ie/rses/ (Accessed, November 2023)
[25] http://www.southernassembly.ie/regional-planning/rses (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
links, for example the River Shannon.				
River Basin Management Plan 2018-2021/Draft River Basin Management Plan (RBMP) (2022 - 2027)[26] This Plan/Draft Plan by the Department of Housing, Local Government and Heritage sets out the objectives and recommendations to help protect, improve and sustainably manage the water environment in Ireland to 2027. The Draft Plan was issued for six-month public consultation in September 2021 which is now closed and submissions are being reviewed. Finalised Plan was due in 2022	• Habitat loss and destruction • Habitat degradation • Habitat/species fragmentation • Disturbance to key species • Changes to favourable conservation status of key species • Changes in key indicators of conservation value, such as water quality	Y	The AA screening for the RBMP/Draft RBMP concluded that the Plan could lead to significant effects on European sites. The RBMP/Draft RBMP is a strategic and high-level plan, which will inform the preparation of lower tier catchment and sub-catchment plans which will in turn inform specific water body interventions. Therefore, there is potential for in-combination effects with the RWRP-SE. The RBMP/Draft RBMP sets out a number of measures and objectives to address pressures on the aquatic environment from, for example, agriculture, forestry and invasive species with an overall aim of improving the water environment. Overall, this will have a positive impact on European sites and associated aquatic habitats and species. As with the Framework Plan, any projects arising as a result of the RBMP/Draft RBMP will be subject to project level AA assessments. Given the mitigation measures set out in Chapter 8 of the RBMP NIS/Chapter 7 of the Draft RBMP NIS and Chapter 6 of this NIS, including the requirement for project level assessments, the RBMP/Draft RBMP will not adversely affect the integrity of any European Site either alone or in-combination with other plans or projects.	N

[26] https://www.gov.ie/en/consultation/2bda0-public-consultation-on-the-draft-river-basin-management-plan-for-ireland-2022-2027/ (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
but not yet adopted.				
Forestry Programme 2014 – 2020: IRELAND[27]/Draft Forest Strategy 2022-2030[28] The objective of the programme/draft strategy is to develop a 100% State funded sustainable and competitive forest sector to provide a full range of benefits to society, environmental, economic and social, which aligns with the Forest Europe definition of forest management in a sustainable manner. The Draft Strategy was issued for a six-week public consultation in October 2022 which is	• Changes to water quality • Loss/ fragmentation of habitats and species • Increase in pollution from sediment and nutrients entering watercourses • Acidification	Y	All activities funded under the programme/draft strategy must adhere to the principles of Sustainable Forest Management, that is foresters and forest owners must adhere to the 'Code of Best Forest Practice – Ireland'[29] and the suite of environmental guidelines (currently under review). Forestry is not listed as a key threat to protected habitats or annex species but is identified as a pressure on both. This programme was subject to screening for AA[30] which concluded that there was potential for significant effects on European sites from the implementation of the programme. The draft strategy will be subject to AA but it is not available at this time. Both the Forestry Programme and the RWRP-SE identify potential LSEs from impacts of a similar nature, and therefore a potential for in-combination effects was identified. A number of mitigation measures are proposed as part of the Forestry Programme as set out in Chapter 6.1 of the NIS. A key measure as set out in Chapter 7.1.1 is that all proposed forestry projects should be subject to an assessment of their impacts, and the proximity of European sites and their associated habitats and species should be taken into account when proposals are generated. Given the mitigation measures set out in Chapter 6 of this NIS and Chapter 6 and 7 of the Forestry Programme NIS, including the requirement for project level assessments, no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[27] https://www.gov.ie/en/publication/forestry-policy-and-strategy/#forestry-programme-2014-2020 (Accessed, November 2023)
[28] https://www.gov.ie/en/consultation/849a5-consultation-on-the-draft-forest-strategy/ (Accessed, November 2023)
[29] https://wayback.archive-it.org/11501/20201127124443/https:/www.agriculture.gov.ie/media/migration/forestry/publications/codeofbestforestpractice/Code%20of%20Best%20Forest%20Prac%20Part%201.pdf (Accessed, November 2023)
[30] https://wayback.archive-it.org/11501/20201127093539/https:/www.agriculture.gov.ie/media/migration/forestry/publicconsultation/newforestryprogramme2014-2020/nis/ForestryProgrammeNaturaImpactStatement290914.pdf (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
now closed and submissions are being reviewed.				
National Marine Planning Framework (NMPF)[31] The Plan by the Department of Housing, Planning and Local Government aims to provide a common framework for the marine area where environmental, social and economic factors will be considered in the decision-making process for a range of projects, plans and policy.	• Habitat loss or destruction • Loss of key supporting habitats and ecosystem complexes • Habitat fragmentation or degradation • Disturbance to habitats/species • Species mortality • Alterations to water quality and/or water movement • Alterations to air quality • Alterations due to climate change • Introduction or spread of invasive species	Y	The NMPF is a strategic plan subject to a high-level AA and SEA. The AA concluded that there was potential for significant effects on European sites from the implementation of the programme given the nature of the policy objectives that it presents. The NMPF is at a national strategic level, therefore it focuses on the potential for indirect impacts arising from the developments arising from the various national policy objectives. Both the NMPF and RWRP-SE identify potential LSEs from impacts of a similar nature, and therefore the potential for in-combination effects was identified. A number of mitigation measures are proposed as part of the NMPF in Chapter 8 of the accompanying NIS for the NMPF. The mitigation chapter was revised post consutation to reflect the final and adopted NMPF. As the NMPF is a strategic plan it relies on other policy, strategy and plan initiatives to achieve its objectives to ensure that the objectives are met and that there are no adverse effects on any European sites. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N
Wicklow County Development Plan	• Loss/reduction of habitat area • Habitat or species	Y	Wicklow County Development Plan 2022-2028 was subject to a SEA, Stage 1 and Stage 2 AA and LSEs were identified for the Plan.	N

[31] https://www.gov.ie/en/publication/60e57-national-marine-planning-framework/ (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
2022-2028[32] The County Development Plan is a land use plan and overall strategy for the proper planning and sustainable development of the functional area of County Wicklow over the six-year period 2022-2028.	fragmentation • Disturbance to key species • Reduction in species density • Changes of indicators of conservation value (e.g., water quality) • Climate change		There is the potential for in-combination effects with the Plan and the RWRP-SE. However, the NIR for Wicklow County Development Plan determined that having incorporated mitigation measures provided in Section 5 of the NIR, the Plan is not foreseen to give rise to any adverse effects on the integrity of European Sites, alone or in combination with other plans or projects. Therefore, given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	
Wexford County Development Plan 2022-2028[33] The County Development Plan sets out the overall strategic spatial planning framework to guide the sustainable development of the county for the six-year period of the plan and beyond.	• Habitat loss, fragmentation and degradation • Species loss, disturbance and displacement • Changes in key indicators of conservation status	Y	Wexford County Development Plan 2022-2028 was subject to a SEA, Stage 1 and Stage 2 AA, and LSEs were identified for the Plan. There is the potential for in-combination effects with the Plan and the RWRP-SE. Having incorporated the mitigation measures outlined in Section 8 of the NIR, it was found that the Plan will not adversely affect (either directly or indirectly) the integrity of any European site, either alone or in combination with other plans or projects. Therefore, given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[32] https://www.wicklow.ie/Living/CDP2021 (Accessed, November 2023)
[33] https://www.wexfordcoco.ie/planning/development-plans-and-local-area-plans/current-plans/wexford-county-development-plan-2022 (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
Carlow County Development Plan 2022-2028[34] The County Development Plan is a land use plan and overall strategy for the proper planning and sustainable development of the functional area of County Carlow over the six-year period 2022-2028.	• Loss/reduction of habitat area • Habitat or species fragmentation • Disturbance to key species • Reduction in species density • Changes of indicators of conservation value (e.g., water quality) • Climate change	Y	Carlow County Development Plan 2022-2028 was subject to a SEA, Stage 1 and Stage 2 AA, and LSEs were identified for the Plan. There is the potential for in-combination effects with the Plan and the RWRP-SE. Having incorporated the mitigation measures outlined in Section 5 of the NIR, it was found that the Plan is not foreseen to give rise to any adverse effects on the integrity of any European Site, alone or in combination with other plans or projects. Therefore, given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N
Kilkenny City and County Development Plan 2021-2027[35] The City and County Development Plan is a land use plan and overall strategy for the proper planning and sustainable development of the functional area of County Kilkenny over the six-year period	• Loss/reduction of habitat area • Habitat or species fragmentation • Disturbance to key species • Reduction in species density • Changes of indicators of conservation value (e.g., water quality) • Climate change	Y	The Kilkenny City and County Development Plan 2021 – 2027 was subject to a SEA, Stage 1 and Stage 2 AA, and LSEs were identified for the Plan. There is the potential for in-combination effects with the Plan and the RWRP-SE. Having incorporated the mitigation measures outlined in Section 5 of the NIR, it was found that the Plan is not foreseen to give rise to any significant effects on the integrity of European Sites, alone or in combination with other plans or projects. Therefore, given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[34] https://consult.carlow.ie/en/consultation/carlow-county-development-plan-2022-2028 (Accessed, November 2023)
[35] https://www.kilkennycoco.ie/eng/services/planning/development-plans/city-and-county-development-plan/adopted-city-and-county-development-plan.html (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
2021-2027.				
Tipperary County Development Plan 2022-2028[36] The Plan is a land use plan and overall strategy for the proper planning and sustainable development of the functional area of County Tipperary over the six-year period 2022-2028.	• Loss/reduction of habitat area • Habitat or species fragmentation • Disturbance to key species • Reduction in species density • Changes of indicators of conservation value (e.g. water quality) • Climate change	Y	The Tipperary County Development Plan 2022-2028 was subject to a SEA, Stage 1 and Stage 2 AA and LSEs were identified for the Plan. There is the potential for in-combination effects with the Plan and the RWRP-SE. Having incorporated the mitigation measures outlined in Section 5 of the NIR, it was found that the Plan is not foreseen to give rise to any adverse effects on the integrity of any European Site, alone or in combination with other plans or projects. Therefore, given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N
Waterford City and County Development Plan 2022-2028[37] The City and County Development Plan is a land use plan and overall strategy for the proper planning and sustainable development of Waterford City and County over the six-	• Changes in water quality • Nutrient/sediment runoff • Noise • Habitat loss/ reduction • Changes in vegetation • Disturbance to species • Invasive species	Y	The Waterford City and County Development Plan 2022-2028 was subject to a SEA, Stage 1 and Stage 2 AA, and LSEs were identified for the Plan. There is the potential for in-combination effects with the Plan and the RWRP-SE. Having incorporated the mitigation measures outlined in Tables 9 and 10 of the NIR, it was found that the Plan is not foreseen to give rise to any adverse effects on the integrity of any European Site, alone or in combination with other plans or projects. Therefore, given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[36] https://www.tipperarycoco.ie/cdp (Accessed, November 2023)
[37] https://www.waterfordcouncil.ie/media/plans_strategies/development-plan/index.htm (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
year period 2022-2028.	• Climate impacts			
Limerick Development Plan 2022-2028[38] The Plan sets out an overall strategy for the proper planning and sustainable development of the functional area of Limerick over a six-year period between 2022 and 2028.	• Loss/reduction of habitat area • Habitat or species fragmentation • Disturbance to key species • Reduction in species density • Changes of indicators of conservation value such as water quality • Climate change	Y	Limerick Development Plan 2022-2028 was subject to a SEA, and both Stage 1 and Stage 2 AA. The AA screening undertaken identified potential LSEs on fourteen European sites. There is the potential for in-combination effects with the Plan and the RWRP-SE. However, a number of mitigation measures are proposed as part of the Plan in Chapter 8 of the accompanying NIR for the Plan. The Plan states that having incorporated the mitigation measures set out in the Plan it is not anticipated to give rise to any significant adverse effects on designated European sites, alone or in combination with other plans or projects. Therefore, given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N
Cork County Development Plan 2022-2028[39] The County Development Plan sets out the policy objectives and the overall strategy for the proper planning and sustainable development of the County over the plan	• Loss of habitat • Reduction of habitat quality or area • Disturbance to key species • Reduction in richness or density of species • Damage to size, characteristics or reproductive ability of	Y	The Cork County Development Plan 2022-2028 was subject to a SEA, Stage 1 and Stage 2 AA, and LSEs were identified for the Plan. There is the potential for in-combination effects with the Plan and the RWRP-SE. However, with the recommendations set out in Tables 8.1 and 8.2 of the NIR, it was found that the Plan will not adversely affect the integrity of any European Site. Therefore, given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[38] https://www.limerick.ie/council/services/planning-and-property/limerick-development-plan/limerick-development-plan-2022-2028 (Accessed, November 2023)
[39] https://www.corkcoco.ie/en/resident/planning-and-development/cork-county-development-plan-2022-2028 (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
period from 2022 to 2028.	populations of species • Negative changes in indicators of conservation value (e.g., water quality)			
Laois County Development Plan 2021-2027[40] The Laois County Development Plan is a land use plan and overall strategy for the proper planning and sustainable development of the functional area of County Laois over the six-year period 2021-2027.	• Loss/reduction of habitat area • Habitat or species fragmentation • Disturbance to key species • Reduction in species density • Changes in indicators of conservation value (e.g. water quality) • Climate change	Y	The Laois County Development Plan 2021-2027 was subject to SEA, Stage 1 and Stage 2 AA, and LSEs were identified for the Plan. There is the potential for in-combination effects with the Plan and the RWRP-SE. Having incorporated the mitigation measures outlined in Section 5 of the NIR, it was found that the Plan is not foreseen to give rise to any significant effects on the integrity of any European Sites, alone or in combination with other plans or projects. Therefore, given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N
Food Vision 2030[41] This is a ten-year agri-food strategy that aims to establish how the agri-food sector is to develop up to 2030 for	• Agricultural intensification • Atmospheric factors • Diffuse pollution of surface water and groundwater	Y	The Food Vision 2030 strategy was subject to AA and SEA. The AA concluded that after the consideration of the positive sustainable measures in place and with safeguards and best practice measures there would be no adverse impacts on the integrity of European sites. There is potential for in-combination effects with the strategy and the RWRP-SE. However, with the mitigation measures proposed as part of Food Vision 2030 in	N

[40] https://laois.ie/departments/planning/review-of-laois-county-development-plan-2017-2023-2/ (Accessed, November 2023)
[41] https://www.gov.ie/en/publication/c73a3-food-vision-2030-a-world-leader-in-sustainable-food-systems/ (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
the benefit of the Irish economy, society and environment.	• Drainage • Reduced breeding success or increased predation, possibly resulting in reduced population viability • Impacts to inshore and offshore fisheries		Chapter 5 of the accompanying NIS for the Strategy, there is no potential for adverse effects on European sites. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	
EU Biodiversity Strategy for 2030[42] This is a long-term plan to protect nature and reverse the degradation of ecosystems. The strategy aims to put Europe's biodiversity on a path to recovery by 2030 and contains specific actions and commitments.	• Establishing a larger network of protected areas • Launching a nature restoration plan • Improved implementation of biodiversity strategies	N	The 2030 Biodiversity Strategy builds upon and goes beyond the existing EU Birds and Habitats Directives and the EU Natura 2000 Network of protected areas. The strategy aims to build our societies' resilience to future threats such as the impacts of climate change, forest fires, food insecurity and disease outbreaks - including by protecting wildlife and fighting illegal wildlife trade. Given the nature of this plan there is potential for beneficial impacts to biodiversity and the conservation objectives of European sites. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N
National Biodiversity Action Plan 2017-2021[43] **/Draft Irelands's 4th National**	• Strengthened legislation to tackle biodiversity loss	N	This Plan provides a framework to track and assess progress towards Ireland's Vision for Biodiversity over a five-year timeframe from 2017 to 2021, and the Draft Plan covers the period 2023 to 2027. Ireland's Vision for Biodiversity is: "That biodiversity and ecosystems in Ireland are conserved and restored,	N

[42] https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_en (Accessed, November 2023)
[43] https://www.npws.ie/legislation/national-biodiversity-plan (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
Biodiversity Action Plan 2023-2027[44] The Plan/Draft Plan sets out actions through which a range of government, civil and private sectors will undertake to achieve Ireland's 'Vision for Biodiversity' and follows on from the work of the first and second National Biodiversity Action Plans. The Draft Plan was issued for two-month public consultation in September 2022 which has now closed, and submissions are being reviewed. Finalised Plan due in 2023.	• Increased awareness of biodiversity and ecosystem services • Conservation of biodiversity and ecosystem services • Improved management of protected areas and species		delivering benefits essential for all sectors of society and that Ireland contributes to efforts to halt the loss of biodiversity and the degradation of ecosystems in the EU and globally." Given the nature of this Plan/Draft Plan there is potential for beneficial impacts to biodiversity and the conservation objectives of European sites. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods, no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	
All Ireland Pollinator Plan 2021 – 2025[45] This plan aims to help restore pollinator populations to healthy	• Making land more pollinator friendly • Conserving rare pollinator species • Support for beekeepers	N	At its core, the Pollinator Plan is about providing food and shelter across all types of land so that pollinators can survive and thrive. It creates a framework to bring together pollinator initiatives across the island. Given the nature of this plan there is potential for beneficial impacts to biodiversity and the conservation objectives of European sites.	N

[44] https://www.gov.ie/en/consultation/1566c-public-consultation-on-irelands-4th-national-biodiversity-action-plan/ (Accessed, November 2023)
[45] https://pollinators.ie/aipp-2021-2025/ (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
levels. Over the next five years, this plan will work to bring about landscape where pollinators can flourish.			Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	
National Waste Action Plan for a Circular Economy 2020 – 2025[46] This plan is Ireland's new roadmap for waste planning and management. It shifts focus away from waste disposal and looks instead to how we can preserve resources by creating a circular economy.	• Transition to a circular economy • Supporting reuse and recycling of materials	N	The plan identifies opportunities for the application of circular economy principles across a range of areas such as food. The plan also recognises the importance of eco- and smart design in waste prevention through the delivery of products that are more amenable to recycling or reuse of constituent components. Given the nature of this plan there is limited potential for negative impacts to biodiversity and some potential for beneficial impacts to biodiversity through a reduction in waste and pollution. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N
Climate Action Plan 2023[47] The plan implements the carbon budgets and sectoral emissions ceilings brought in in 2022 and sets a	• Loss/reduction of habitat area • Habitat fragmentation • Disturbance to key species • Reduction in species density	Y	The plan sets out proposals to reduce Ireland's greenhouse gas emissions while implementing other important actions, such as powering renewable energy resources, improving energy efficiency of new developments, reducing transport-related emissons, promoting sustainable economic development pathways, changing how land is used, and implementing essential adaptations for climate change. However, there is also potential for in-combination effects with the Plan and the	N

[46] https://www.gov.ie/en/publication/4221c-waste-action-plan-for-a-circular-economy/ (Accessed, November 2023)
[47] https://www.gov.ie/pdf/?file=https://assets.gov.ie/243585/9942d689-2490-4ccf-9dc8-f50166bab0e7.pdf#page=null (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
roadmap for taking decisive action to halve Ireland's emissions by 2030 and reach net zero no later than 2050.	• Alterations to water quality/water movement		RWRP-SE. Given the nature of this plan there is potential for beneficial impacts to biodiversity and the conservation objectives of European sites. There is also potential for negative impacts to European sites, however, all lower-level plans and projects arising through the implementation of the Plan will themselves be subject to AA/screening for AA when further details of design and location are known. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	
Offshore Renewable Energy Development Plan (OREDP)[48]/Draft OREDP II[49] This Plan/Draft Plan provides a framework for the sustainable development of Ireland's offshore renewable energy resource. The Draft Plan was issued for two-month public consultation in February 2023 which has now closed, and submissions are being reviewed. Finalised	• Loss or damage to habitats • Injury to or mortality of species • Impacts to water quality and water movement • Species disturbance • Collision risk • Changes to food availability • Invasive non-native species	Y	The Offshore Renewable Energy Development Plan (OREDP)/Draft OREDP II was subject to AA and SEA. The AA concluded that, with the implementation of mitigation measures, the OREDP will not have a likely significant effect on a Natura site or cetacean species listed under Annex IV of the Habitats Directive. There is potential for in-combination effects with the Plan/Draft Plan and the RWRP-SE. However, with the mitigation measures proposed as part of the OREDP in Chapter 11 of the accompanying Plan NIS and Chapter 5 of the accompanying Draft Plan NIS, there is no potential for adverse effects on European sites. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[48] https://www.gov.ie/en/publication/e13f49-offshore-renewable-energy-development-plan/ (Accessed, November 2023)
[49] https://www.gov.ie/en/publication/71e36-offshore-renewable-energy-development-plan-ii-oredp-ii/ (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
Plan expected in 2023.				
National Adaptation Framework (NAF)[50] This plan specifies the national strategy for the application of adaptation measures in different sectors and by local authorities to reduce the vulnerability of the State to the negative effects of climate change and to avail of any positive effects that may occur.	• Loss/reduction of habitat area • Habitat fragmentation • Disturbance to key species • Reduction in species density • Alterations to water quality/water movement	Y	The National Adaptation Framework was subject to screening for AA. This screening concluded that an AA of the framework was not required, given that the administrative provisions of Articles 9(1) and 9(3) of the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations, as amended have not been fulfilled. Adaptation approaches and identification of locations or sites will be detailed via lower-level adaptation plans and strategies which may undergo appropriate assessment, as appropriate. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N
Tourism Development and Innovation 2016 – 2022[51] This strategy sets out the framework and mechanisms for delivery of investment to cities, towns, villages, communities and businesses across the country.	• Loss/reduction of habitat area • Habitat fragmentation • Disturbance to key species • Reduction in species density • Alterations to water quality/water movement	Y	The strategy will be outcome based and will identify the types of projects to invest in that will support innovation in the tourism sector, rather than specific projects or locations for investment. There is potential for in-combination effects with the Plan and the RWRP-SE. However, all lower-level plans and projects arising through the implementation of the Plan will themselves be subject to AA/Screening for AA when further details of design and location are known. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[50] https://www.gov.ie/en/publication/fbe331-national-adaptation-framework/ (Accessed, November 2023)
[51] https://www.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/2_Develop_Your_Business/6_Funding/1-FI-Tourism-Investment-Strategy-Final-07-06-16.pdf (Accessed, November 2023)

Plan/Project	Potential impact types common to RWRP-SE and other plans	In-combination Likely Significant Effects? (Y/N)	Potential for in-combination effects and mitigation	In-combination adverse effects on site integrity? (Y/N)
Ireland's Ancient East Regional Tourism Development Strategy 2023 – 2027[52] The Strategy sets out a strategic approach to unlocking the commercial potential of Ireland's Ancient East. It will ensure focus on tourism development is sustainable and regenerative and that the benefits accrue to local communities and to nature.	• Loss/reduction of habitat area • Habitat/species fragmentation • Disturbance to key species • Reduction in species density • Changes of indicators of conservation value e.g., decreases in water quality/quantity • Climate change	Y	The Strategy was subject to AA and SEA. The AA concluded that, with the implementation of mitigation measures, the Strategy is not foreseen to give rise to any significant adverse effects on designated European sites, alone or in combination with other plans or projects. There is potential for in-combination effects with the Strategy and the RWRP-SE. However, with the mitigation measures proposed in Chapter 5 of the Strategy NIS, there is no potential for adverse effects on European sites. However, all lower-level plans and projects arising through the implementation of the Strategy will themselves be subject to AA when further details of design and location are known. Given the mitigation measures set out in Chapter 6 of this NIS and with the standard good practice construction methods no AESI in light of a European site's conservation objectives are predicted as a result of in-combination effects.	N

[52] https://www.failteireland.ie/Regional-experience-brands/regional-development-strategies/IAE-Regional-Development-Strategy.aspx (Accessed, November 2023)

Table 7.2 - Summary of In-combination Assessment between SAs and Projects, between SAs within the SE region, and between the SE, NW, SW and EM regions

Study Area	Appendix E	Potential for in-combination effect	Conclusion
SAK	See Table E1	**In-combination with other projects** Potential in-combination effects with other projects and options were identified for **Lower River Suir SAC** from habitat loss, mortality, pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for options **SAK-073** (pollution and disturbance only)**, SAK-106** (pollution only)**, SAK-120** (all impacts)**, SAK-180** (pollution and disturbance only)**, SAK-211** (all impacts)**, SAK-441** (pollution and disturbance only)**, SAK-560 & SAK-618 combined** (all impacts)**, SAK-569** (pollution and disturbance only)**, SAK-648** (pollution and disturbance only)**, SAK-837** (mortality, pollution, spread of invasive non-native species and disturbance only)**, SAK-853** (all impacts)**, SAK-949** (all impacts)**, SAK-975** (all impacts)**, SAK-983** (all impacts) and **SAK-985c** (pollution and disturbance only) is concurrent with East Limerick Greenway, Cashel to Cahir Greenway, Marlfield to Cahir Blueway, Suir Blueway to Waterford Greenway Link, Carrick-on-Suir Regeneration Plan, Clonmel 2030 Regeneration Plan, Clonmel Community Nursing Unit, Gas House Bridge to Suir Island Blueway, Prior Park Social Housing, Templemore Town Hall, An Duiche Social Housing, Tipperary Town Regeneration, Waterford City Wastewater Treatment Plant, Waterford City Regeneration, Kilbarry Social Housing, WIT Engineering, ICT and Teaching Building, and Waterford City North Quays works. There is also the potential for impacts during operation of some of these projects from habitat degradation and water table/availability from options **SAK-120, SAK-211, SAK-441, SAK-560 & SAK-618 combined, SAK-648, SAK-853, SAK-949** and **SAK-983** (see Appendix E, Table E1 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **River Barrow And River Nore SAC** from mortality, pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for options **SAK-077** (all impacts), **SAK-648** (pollution only), **SAK-853** (pollution only) and **SAK-949** (pollution only) is concurrent with Callan Friary Complex/Upper Bridge St Regeneration & Masterplan, Callan Town Regeneration, Suir Blueway to Waterford Greenway Link, Waterford City Wastewater Treatment Plant scheme, Waterford City Regeneration Plan, Kilbarry Social Housing, WIT Engineering, ICT and Teaching Building, and Waterford City North Quays works. There is also the potential for impacts during operation of some of these projects from habitat degradation and water table/availability from option **SAK-077** (see Appendix E, Table E1 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **River Nore SPA** from pollution and disturbance impacts during construction if the construction phase for option **SAK-077** (all impacts) is concurrent with Callan Friary Complex/Upper Bridge St Regeneration & Masterplan and the Callan Town Regeneration works (see Appendix E, Table E1 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Blackwater Callows SPA** from pollution and disturbance impacts during construction if the construction phase for options **SAK-211**	With the implementation of mitigation as detailed in **Chapter 6.3** and **Appendix E (Table E1)** there will be no adverse effects on the integrity of these European sites, either alone or in-combination with other plans or projects.

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		(disturbance only), **SAK-441** (disturbance only), **SAK-472** (disturbance only), **SAK-973** (all impacts), **SAK-983** (disturbance only) and **SAK-995** (disturbance only) is concurrent with Fermoy Town Centre Renewal Project, Waterford Greenway Dungarvan to West of Ballyduff Upper, Blackwater Community School and Blackwater River Valley Regeneration Plan works (see Appendix E, Table E1 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Blackwater River (Cork/Waterford) SAC** from habitat loss, mortality, pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for options **SAK-386** (pollution only), **SAK-444** (pollution and disturbance only), **SAK-477** (pollution only) and **SAK-973** (all impacts) is concurrent with Fermoy Town Centre Renewal Project, Regeneration of Youghal Town Centre, Waterford Greenway Dungarvan to West of Ballyduff Upper, Blackwater River Valley Regeneration Plan and Blackwater Community School works. There is also the potential for impacts during operation of some of these projects from habitat degradation and water table/availability from option **SAK-973** (see Appendix E, Table E1 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Dungarvan Harbour SPA** from habitat loss, pollution and disturbance impacts during construction if the construction phase for options **SAK-387** (pollution and disturbance only), **SAK-441** (disturbance only), **SAK-450** (disturbance only), **SAK-472** (pollution and disturbance only), **SAK-949** (disturbance only), **SAK-973** (disturbance only) and **SAK-995** (all impacts) is concurrent with Regeneration of Youghal Town Centre, Waterford Greenway Dungarvan to West of Ballyduff Upper and Blackwater River Valley Regeneration Plan works (see Appendix E, Table E1 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Helvick Head to Ballyquin SPA** from pollution impacts during construction if the construction phase for option **SAK-478** (all impacts) is concurrent with Waterford Greenway, Dungarvan to West of Ballyduff Upper works (see Appendix E, Table E1 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Tramore Back Strand SPA** from disturbance impacts during construction if the construction phase for options **SAK-560 & SAK-618 combined** (all impacts) and **SAK-949** (all impacts) is concurrent with Waterford City Wastewater Treatment Plant, Waterford City Regeneration Plan, Kilbarry Social Housing, WIT Engineering, ICT and Teaching Building and Waterford City North Quays works (see Appendix E, Table E1 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Blackwater Estuary SPA** from pollution impacts during construction if the construction phase for option **SAK-973** (all impacts) is concurrent with Regeneration of Youghal Town Centre, Waterford Greenway, Dungarvan to West of Ballyduff Upper and Blackwater River Valley Regeneration Plan works (see Appendix E, Table E1 for details on specific options and projects).	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		Potential in-combination effects with other projects and options were identified for **Lower River Shannon SAC** from pollution impacts during construction if the construction phase for options **SAK-975** (all impacts) and **SAK-985c** (all impacts) is concurrent with East Limerick Greenway works (see Appendix E, Table E1 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **River Shannon and River Fergus Estuaries SPA** from pollution and disturbance impacts during construction if the construction phase for option **SAK-985c** (all impacts) is concurrent with East Limerick Greenway works (see Appendix E, Table E1 for details on specific options and projects). **In-combination between Preferred Approach options** There is potential for construction related in-combination effects from the projects within SAK to **Blackwater River (Cork/Waterford) SAC** from disturbance and pollution impacts if Preferred Approach options **SAK-386** (pollution only), **SAK-444** (all impacts)**, SAK-477** (pollution only) and **SAK-973** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAK to **Lower River Shannon SAC** from spread of invasive non-native species, disturbance and pollution if Preferred Approach options **SAK-975** (all impacts) and **SAK-985c** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options and projects). There is potential for construction and operational related in-combination effects from the projects within SAK to **Lower River Suir SAC** from habitat loss, mortality, disturbance, spread of invasive non-native species, pollution, habitat degradation and water table/availability impacts if Preferred Approach options **SAK-073** (pollution and disturbance only)**, SAK-106** (pollution only)**, SAK-120** (all impacts)**, SAK-180** (pollution and disturbance only)**, SAK-211** (all impacts)**, SAK-441** (pollution, disturbance, habitat degradation and water table/availability only)**, SAK-560 & SAK-618 combined** (all impacts)**, SAK-569** (pollution and disturbance only)**, SAK-648** (pollution, disturbance, habitat degradation and water table/availability only)**, SAK-837** (mortality, pollution, spread of invasive non-native species and disturbance only)**, SAK-853** (all impacts)**, SAK-949** (all impacts)**, SAK-975** (habitat loss, mortality, pollution, spread of invasive non-native species and disturbance only)**, SAK-983** (all impacts) and **SAK-985c** (pollution and disturbance only) were constructed at the same time and/or during operation (see Appendix E, Table E1 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAK to **River Barrow And River Nore SAC** from pollution if Preferred Approach options **SAK-077** (all impacts)**, SAK-648** (all impacts), **SAK-853** (all impacts) and **SAK-949** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAK to **Blackwater Callows SPA** from disturbance if Preferred Approach options **SAK-211** (all impacts), **SAK-441** (all impacts),	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		SAK-472 (all impacts), **SAK-973** (all impacts), **SAK-983** (all impacts) and **SAK-995** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAK to **Dungarvan Harbour SPA** from pollution and disturbance if Preferred Approach options **SAK-387** (all impacts), **SAK-441** (disturbance only)**, SAK-450** (disturbance only), **SAK-472** (all impacts), **SAK-949** (disturbance only), **SAK-973** (disturbance only) and **SAK-995** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAK to **Mid-Waterford Coast SPA** from disturbance and pollution impacts if Preferred Approach options **SAK-450** (pollution only), **SAK-525** (pollution only)**, SAK-949** (all impacts) and **SAK-995** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAK to **Tramore Back Strand SPA** from disturbance impacts if Preferred Approach options **SAK-560 and SAK-618 combined** (all impacts) and **SAK-949** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options and projects).	
SAL	See Table E2	**In-combination with other projects** Potential in-combination effects with other projects and options were identified for **River Barrow And River Nore SAC** from habitat loss, mortality, pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for options **SAL-015** (pollution and disturbance only), **SAL-073** (pollution and disturbance only), **SAL-078** (all impacts), **SAL-511** (all impacts), **SAL-521** (all impacts) and **SAL-526** (all impacts) is concurrent with Barrow Valley Greenway, Carlow Public Realm and Pedestrian Linkage Project, Carlow Wastewater Treatment Plant, IT Carlow Science & Health Building, Abbey Quarter, Callan Friary Complex/Upper Bridge St Regeneration & Masterplan for the historic core of Callan Town, Callan Town Regeneration, Crokers Hill, Kennyswell Road, Kilkenny City Enhanced Livability Study, Kilkenny Regional Water Supply Scheme - Upgrade of Troyswood Water Treatment Plant, Kilkenny Wastewater Network, St Columba's Hospital, Thomastown, Thomastown Regeneration Phase 2, Waterford City Wastewater Treatment Plant, Waterford City Regeneration, WIT Engineering, ICT and Teaching Building, Kilbarry Social Housing, Waterford, Waterford City and Environs - North Quays, South East Greenway- Section from New Ross to Waterford, and Wexfordia - the New Ross Tourism Transformation works. There is also the potential for impacts during operation of some of these projects from habitat degradation and water table/availability from options **SAL-015, SAL-078** and **SAL-521** (see Appendix E, Table E2 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Wexford Harbour and Slobs SPA** from disturbance impacts during construction if the construction phase for option **SAL-073** (all impacts) is concurrent with Barrow Valley Greenway, Clonhaston, Enniscorthy, Wexford, Enniscorthy Flood	With the implementation of mitigation as detailed in **Chapter 6.3** and **Appendix E (Table E2)** there will be no adverse effects on the integrity of these European sites, either alone or in-combination with other plans or projects.

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		Relief Scheme, Kerlogue Manor, Roxborough, Drinagh, Wexford, Roxborough, Mulgannon, Wexford, Whiterock Hill, Wexford, Phase 1, and Wexford General Hospital Ward Block works (see Appendix E, Table E2 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Bannow Bay SPA** from disturbance impacts during construction if the construction phase for option **SAL-073** (all impacts) is concurrent with Barrow Valley Greenway and South East Greenway- Section from New Ross to Waterford works (see Appendix E, Table E2 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Ballyteige Burrow SPA** from disturbance impacts during construction if the construction phase for option **SAL-073** (all impacts) is concurrent with Kerlogue Manor, Roxborough, Drinagh, Wexford, Roxborough, Mulgannon, Wexford, and Whiterock Hill, Wexford, Phase 1 works (see Appendix E, Table E2 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **River Nore SPA** from habitat loss, mortality, pollution and disturbance impacts during construction if the construction phase for options **SAL-078** (pollution and disturbance only), **SAL-511** (all impacts) and **SAL-521** (pollution and disturbance only) is concurrent with with Abbey Quarter, Callan Friary Complex/Upper Bridge St Regeneration & Masterplan for the historic core of Callan Town, Callan Town Regeneration, Kilkenny City Enhanced Livability Study, Kilkenny Regional Water Supply Scheme - Upgrade of Troyswood Water Treatment Plant, Kilkenny Wastewater Network, St Columba's Hospital, Thomastown, and Thomastown Regeneration Phase 2 works (see Appendix E, Table E2 for details on specific options and projects). **In-combination between Preferred Approach options** There is potential for construction related in-combination effects from the projects within SAL to **River Barrow And River Nore SAC** from habitat loss, mortality, spread of invasive non-native species, disturbance, pollution, habitat degradation and water table/availability impacts if Preferred Approach options **SAL-015** (pollution, disturbance, habitat degradation and water table/availability only)**, SAL-073** (pollution and disturbance only), **SAL-078** (all impacts), **SAL-511** (habitat loss, mortality, spread of invasive non-native species, disturbance and pollution only), **SAL-521** (all impacts) and **SAL-526** (habitat loss, mortality, spread of invasive non-native species, disturbance and pollution only) were constructed at the same time and/or during operation (see Appendix E, Table E2 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAL to **River Nore SPA** from pollution and disturbance impacts if Preferred Approach options **SAL-078** (all impacts)**, SAL-511** (all impacts) and **SAL-521** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options and projects).	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
SAM	See Table E3	**In-combination with other projects** Potential in-combination effects with other projects and options were identified for **Wexford Harbour and Slobs SPA** from habitat loss, pollution and disturbance impacts during construction if the construction phase for options **SAM-017** (disturbance only), **SAM-029** (pollution and disturbance only), **SAM-036** (disturbance only), **SAM-044** (pollution and disturbance only), **SAM-050** (pollution and disturbance only), **SAM-061** (pollution and disturbance only), **SAM-100** (pollution and disturbance only), **SAM-127 and SAM-207 combined** (pollution and disturbance only), **SAM-148** (disturbance only), **SAM-149** (disturbance only), **SAM-575** (disturbance only) and **SAM-576** (all impacts) is concurrent with Clonhaston, Enniscorthy, Enniscorthy Flood Relief Scheme, Ferrycarraig Experimental Archaeology, Kerlogue Manor, Roxborough, Drinagh, Wexford, Roxborough, Mulgannon, Wexford, Whiterock Hill, Wexford, Phase 1, Wexford General Hospital Ward Block and Trinity Wharf works (see Appendix E, Table E3 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Cahore Marshes SPA** from disturbance impacts during construction if the construction phase for options **SAM-017** (all impacts), **SAM-029** (all impacts), **SAM-061** (all impacts) and **SAM-127 and SAM-207 combined** (all impacts) is concurrent with Ramstown, Gorey works (see Appendix E, Table E3 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Slaney River Valley SAC** from habitat loss, mortality, pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for options **SAM-029** (pollution and disturbance only), **SAM-036** (all impacts), **SAM-044** (pollution only), **SAM-050** (pollution only), **SAM-061** (pollution and disturbance only), **SAM-100** (pollution only), **SAM-127 and SAM-207 combined** (pollution and disturbance only), **SAM-141** (pollution only), **SAM-144** (pollution only), **SAM-146** (pollution and disturbance only), **SAM-149** (disturbance only), **SAM-547** (pollution and disturbance only) and **SAM-576** (all impacts) is concurrent with Clonhaston, Enniscorthy, Enniscorthy Flood Relief Scheme, Ferrycarraig Experimental Archaeology, Kerlogue Manor, Roxborough, Drinagh, Wexford, Roxborough, Mulgannon, Wexford, Whiterock Hill, Wexford, Phase 1, Trinity Wharf and Wexford General Hospital Ward Block works. There is also the potential for impacts during operation of some of these projects from habitat degradation and water table/availability from options **SAM-029** and **SAM-036** (see Appendix E, Table E3 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **The Raven SPA** from disturbance impacts during construction if the construction phase for options **SAM-061** (all impacts), **SAM-127 and SAM-207 combined** (all impacts), **SAM-148** (all impacts), **SAM-149** (all impacts) and **SAM-576** (all impacts) is concurrent with Clonhaston, Enniscorthy, Ferrycarraig Experimental Archaeology, Kerlogue Manor, Roxborough, Drinagh, Wexford, Roxborough, Mulgannon, Wexford, Whiterock Hill, Wexford, Phase 1 and Wexford General Hospital Ward Block works (see Appendix E, Table E3 for details on specific options and projects).	With the implementation of mitigation as detailed in **Chapter 6.3** and **Appendix E (Table E3)** there will be no adverse effects on the integrity of these European sites, either alone or in-combination with other plans or projects.

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		Potential in-combination effects with other projects and options were identified for **Bannow Bay SPA** from disturbance impacts during construction if the construction phase for options **SAM-100** (all impacts), **SAM-148** (all impacts), **SAM-149** (all impacts), **SAM-575** (all impacts) and **SAM-576** (all impacts) is concurrent with Ferrycarraig Experimental Archaeology works (see Appendix E, Table E3 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Tacumshin Lake SPA** from disturbance impacts during construction if the construction phase for options **SAM-148** (all impacts), **SAM-149** (all impacts) and **SAM-576** (all impacts) is concurrent with Ferrycarraig Experimental Archaeology, Kerlogue Manor, Roxborough, Drinagh, Wexford, Roxborough, Mulgannon, Wexford, and Whiterock Hill, Wexford, Phase 1 works (see Appendix E, Table E3 for details on specific options and projects). Potential in-combination effects with other projects and options were identified for **Ballyteige Burrow SPA** from disturbance impacts during construction if the construction phase for options **SAM-148** (all impacts), **SAM-149** (all impacts), **SAM-575** (all impacts) and **SAM-576** (all impacts) is concurrent with Ferrycarraig Experimental Archaeology, Kerlogue Manor, Roxborough, Drinagh, Wexford, Roxborough, Mulgannon, Wexford, and Whiterock Hill, Wexford, Phase 1 works (see Appendix E, Table E3 for details on specific options and projects). **In-combination between Preferred Approach options** There is potential for construction related in-combination effects from the projects within SAM to **Ballyteige Burrow SAC** from pollution impacts if Preferred Approach options **SAM-148** (all impacts) and **SAM-149** (all impacts) were constructed at the same time (see Appendix E, Table E3 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAM to **Bannow Bay SAC** from pollution impacts if Preferred Approach options **SAM-149** (all impacts) and **SAM-575** (all impacts) were constructed at the same time (see Appendix E, Table E3 for details on specific options and projects). There is potential for construction and operational related in-combination effects from the projects within SAM to **Slaney River Valley SAC** from habitat loss, mortality, spread of invasive non-native species, disturbance, pollution, habitat degradation and water table/availability impacts if Preferred Approach options **SAM-029** (pollution, disturbance, habitat degradation and water table/availability only), **SAM-036** (all impacts), **SAM-044** (pollution only), **SAM-050** (pollution only), **SAM-061** (pollution and disturbance only), **SAM-100** (pollution only), **SAM-127 and SAM-207 combined** (pollution and disturbance only), **SAM-141** (pollution only), **SAM-144** (pollution only), **SAM-146** (pollution and disturbance only), **SAM-149** (disturbance only), **SAM-547** (pollution and disturbance only) and **SAM-576** (habitat loss, mortality, spread of invasive non-native species, disturbance and pollution only) were constructed at the same time and/or during operation (see Appendix E, Table E3 for details on specific options and projects).	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		There is potential for construction related in-combination effects from the projects within SAM to **Ballyteige Burrow SPA** from pollution and disturbance impacts if Preferred Approach options **SAM-148** (all impacts)**, SAM-149** (all impacts), **SAM-575** (disturbance only) and **SAM-576** (disturbance only) were constructed at the same time (see Appendix E, Table E3 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAM to **Bannow Bay SPA** from pollution and disturbance impacts if Preferred Approach options options **SAM-100** (disturbance only), **SAM-148** (disturbance only)**, SAM-149** (all impacts), **SAM-575** (all impacts) and **SAM-576** (disturbance only) were constructed at the same time (see Appendix E, Table E3 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAM to **Cahore Marshes SPA** from disturbance impacts if Preferred Approach options **SAM-017** (all impacts)**, SAM-029** (all impacts), **SAM-061** (all impacts) and **SAM-127 and SAM-207 combined** (all impacts) were constructed at the same time (see Appendix E, Table E3 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAM to **Tacumshin Lake SPA** from disturbance impacts if Preferred Approach options **SAM-148** (all impacts)**, SAM-149** (all impacts) and **SAM-576** (all impacts) were constructed at the same time (see Appendix E, Table E3 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAM to **The Raven SPA** from pollution and disturbance impacts if Preferred Approach options options **SAM-061** (disturbance only), **SAM-127 and SAM-207 combined** (all impacts)**, SAM-148** (disturbance only), **SAM-149** (disturbance only) and **SAM-576** (all impacts) were constructed at the same time (see Appendix E, Table E3 for details on specific options and projects). There is potential for construction related in-combination effects from the projects within SAM to **Wexford Harbour and Slobs SPA** from pollution and disturbance impacts if Preferred Approach options options **SAM-017** (disturbance only), **SAM-029** (all impacts), **SAM-036** (disturbance only), **SAM-044** (all impacts), **SAM-050** (all impacts), **SAM-061** (all impacts), **SAM-100** (all impacts), **SAM-127 and SAM-207 combined** (all impacts)**, SAM-148** (disturbance only), **SAM-149** (disturbance only), **SAM-575** (disturbance only) and **SAM-576** (all impacts) were constructed at the same time (see Appendix E, Table E3 for details on specific options and projects).	
SE Region	See Table E4	**In-combination between Study Areas within the SE region** There are potential in-combination effects between options across Study Areas but only if construction/operation of options progressed concurrently as follows: • On **River Barrow And River Nore SAC** from options within **SAK** and **SAL**. There is potential for in-combination impacts from habitat loss, mortality risk, habitat degradation, disturbance and spread of invasive non-native species if construction of options within these SAs is concurrent, and during operation from water	With the implementation of mitigation as detailed in **Chapter 6.3** and **Appendix E (Table E4)** there will be no adverse effects on the integrity of these European sites, either alone or in-

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		table/availability and habitat degradation impacts. • On **River Nore SPA** from options within **SAK** and **SAL**. There is potential for in-combination impacts from habitat degradation and disturbance if construction of options within these SAs is concurrent. • On **Tramore Back Strand SPA** from options within **SAK** and **SAM**. There is potential for in-combination impacts from disturbance if construction of options within these SAs is concurrent. • On **Ballyteige Burrow SPA** from options within **SAL** and **SAM**. There is potential for in-combination impacts from disturbance if construction of options within these SAs is concurrent. • On **Bannow Bay SAC** from options within **SAL** and **SAM**. There is potential for in-combination impacts from habitat degradation if construction of options within these SAs is concurrent. • On **Bannow Bay SPA** from options within **SAL** and **SAM**. There is potential for in-combination impacts from habitat degradation and disturbance if construction of options within these SAs is concurrent. • On **Wexford Harbour and Slobs SPA** from options within **SAL** and **SAM**. There is potential for in-combination impacts from disturbance if construction of options within these SAs is concurrent.	combination with other plans or projects.
SE, NW, SW and EM Regions	See Table E5	**In-combination between the SE region, NW region, SW region and the EM region** There are potential in-combination effects between options across regional groups but only if construction/operation of options progressed concurrently as follows: • On **River Barrow And River Nore SAC** from options within **EM** and **SE**. There is potential for in-combination impacts from habitat loss, mortality risk, habitat degradation, disturbance and spread of invasive non-native species if construction of options within these regions is concurrent, and during operation from water table/availability and habitat degradation impacts. • On **River Nore SPA** from options within **EM** and **SE**. There is potential for in-combination impacts from habitat degradation and disturbance if construction of options within these regions is concurrent. • On **Slaney River Valley SAC** from options within **EM** and **SE**. There is potential for in-combination impacts from habitat loss, mortality risk, habitat degradation, disturbance and spread of invasive non-native species if construction of options within these regions is concurrent. • On **Slievefelim to Silvermines Mountains SPA** from options within **EM** and **SE**. There is potential for in-combination impacts from disturbance if construction of options within these regions is concurrent. • On **Blackwater Callows SPA** from options within **SE** and **SW**. There is potential for in-combination impacts from habitat degradation and disturbance if construction of options within these regions is concurrent. • On **Blackwater Estuary SPA** from options within **SE** and **SW**. There is potential for in-combination impacts	With the implementation of mitigation as detailed in **Chapter 6.3** and **Appendix E (Table E5)** there will be no adverse effects on the integrity of these European sites, either alone or in-combination with other plans or projects.

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		from habitat degradation if construction of options within these regions is concurrent. • On **Four Roads Turlough SPA** from options within **EM** and **NW**. There is potential for in-combination impacts from disturbance if construction of options within these regions is concurrent. • On **Lough Derravarragh SPA** from options within **EM** and **NW**. There is potential for in-combination impacts from disturbance if construction of options within these regions is concurrent. • On **Lough Ree SAC** from options within **EM** and **NW**. There is potential for in-combination impacts from habitat degradation and disturbance if construction of options within these regions is concurrent, and during operation from water table/availability and habitat degradation impacts. • On **Lough Ree SPA** from options within **EM** and **NW**. There is potential for in-combination impacts from habitat degradation and disturbance if construction of options within these regions is concurrent. • On **River Boyne and River Blackwater SAC** from options within **EM** and **NW**. There is potential for in-combination impacts from habitat degradation, disturbance and spread of invasive non-native species if construction of options within these regions is concurrent. • On **River Boyne and River Blackwater SPA** from options within **EM** and **NW**. There is potential for in-combination impacts from habitat degradation and disturbance if construction of options within these regions is concurrent. • On **River Suck Callows SPA** from options within **EM** and **NW**. There is potential for in-combination impacts from habitat degradation and disturbance if construction of options within these regions is concurrent. • On **Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA** from options within **EM** and **SW**. There is potential for in-combination impacts from disturbance if construction of options within these regions is concurrent. • On **Blackwater River (Cork/Waterford) SAC** from options within **EM, SE** and **SW**. There is potential for in-combination impacts from habitat loss (**SE** and **SW** only), mortality risk (**SE** and **SW** only), habitat degradation (all three regions), disturbance (**SE** and **SW** only) and spread of invasive non-native species (**SE** and **SW** only) if construction of options within these regions is concurrent, and during operation from water table/availability (**SE** and **SW** only) and habitat degradation (**SE** and **SW** only) impacts. • On **Lower River Suir SAC** from options within **EM, SE** and **SW**. There is potential for in-combination impacts from habitat degradation (all three regions), disturbance (**EM** and **SE** only) and spread of invasive non-native species (**EM** and **SE** only) if construction of options within these regions is concurrent. • On **Lower River Shannon SAC** from options within **EM, NW, SE** and **SW**. There is potential for in-combination impacts from habitat loss (**EM, NW** and **SW** only), mortality risk (all regions), habitat degradation (all regions), disturbance (all regions) and spread of invasive non-native species (all regions) if	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		construction of options within these regions is concurrent, and during operation from water table/availability (**EM, SE** and **SW** only) and habitat degradation (**EM, SE** and **SW** only) impacts. • On **River Shannon and River Fergus Estuaries SPA** from options within **EM, NW, SE** and **SW**. There is potential for in-combination impacts from habitat degradation (all regions) and disturbance (**EM, NW** and **SE** only) if construction of options within these regions is concurrent.	

8 South East Summary and Conclusion

8.1 South East Region Summary

8.1.1 In-combination Assessment (SE region Summary)

The in-combination assessment is detailed in Chapter 7 and Appendix E of this report including the assessment of potential in-combination effects at the SE regional level. In summary, potential in-combination effects were identified within the SE region between Preferred Approaches, between Preferred Approaches and other (non- Uisce Éireann) projects, and between Study Areas (Preferred Approaches only) as shown in Table 8.1 below. Potential in-combination effects were also identified between Preferred Approaches in the SE region, the NW region, the SW region and the EM region as shown in Table 8.2. 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 other external projects, and in the absence of mitigation. With the implementation of mitigation as outlined in Chapter 6.3 and Appendix E 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 the Preferred Approach options associated with the RWRP-SE.

Table 8.1 – European sites with potential in-combination effects within the SE region

In-combination effects between Preferred Approaches and other projects within a Study Area	In-combination effects between Preferred Approaches only within a Study Area	In-combination effects between Study Areas (Preferred Approaches only)
Ballyteige Burrow SPA	Ballyteige Burrow SAC	Ballyteige Burrow SPA
Bannow Bay SPA	Ballyteige Burrow SPA	Bannow Bay SAC
Blackwater Callows SPA	Bannow Bay SAC	Bannow Bay SPA
Blackwater Estuary SPA	Bannow Bay SPA	River Barrow And River Nore SAC
Blackwater River (Cork/Waterford) SAC	Blackwater Callows SPA	River Nore SPA
Cahore Marshes SPA	Blackwater River (Cork/Waterford) SAC	Tramore Back Strand SPA
Dungarvan Harbour SPA	Cahore Marshes SPA	Wexford Harbour and Slobs SPA
Helvick Head to Ballyquin SPA	Dungarvan Harbour SPA	
Lower River Shannon SAC	Lower River Shannon SAC	
Lower River Suir SAC	Lower River Suir SAC	
River Barrow and River Nore SAC	Mid-Waterford Coast SPA	
River Nore SPA	River Barrow and River Nore SAC	
River Shannon and River Fergus Estuaries SPA	River Nore SPA	
Slaney River Valley SAC	Slaney River Valley SAC	
Tacumshin Lake SPA	Tacumshin Lake SPA	
The Raven SPA	The Raven SPA	
Tramore Back Strand SPA	Tramore Back Strand SPA	
Wexford Harbour and Slobs SPA	Wexford Harbour and Slobs SPA	

Table 8.2 – European sites with potential in-combination effects between the SE region, the NW region, the SW region and the EM region

In-combination effects between Regional Groups (Preferred Approaches only)
Blackwater Callows SPA
Blackwater Estuary SPA
Blackwater River (Cork/Waterford) SAC
Four Roads Turlough SPA
Lough Derravarragh SPA
Lough Ree SAC
Lough Ree SPA
Lower River Shannon SAC
Lower River Suir SAC
River Barrow And River Nore SAC
River Boyne and River Blackwater SAC
River Boyne and River Blackwater SPA
River Nore SPA
River Shannon and River Fergus Estuaries SPA
River Suck Callows SPA
Slaney River Valley SAC
Slievefelim to Silvermines Mountains SPA
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA

Groundwater Abstraction

The potential for in-combination effects on groundwater bodies have been considered in the hydrogeological assessment of the groundwater abstractions. The methodology for setting out the process for groundwater assessment and cumulative assessment is set out in Appendix C of the Framework Plan. The assessment considered the likely cumulative effects of groundwater abstractions on meeting WFD objectives.

In-combination effects from groundwater and surface water abstractions on European sites is considered in the in-combination assessment undertaken in this NIS.

8.2 Conclusion

The conclusion of the NIS for the RWRP-SE 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-SE.

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