Spring 2023

Regional Water Resources Plan–South West

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 legislates 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. Therefore in this NIS, which was developed prior to the name change, all references to Irish Water shall be construed as Uisce Éireann.

Baseline data included in the RWRP-SW 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-SW. 2019 was selected as the base year to align with the planning period (2019-2025) of the NWRP.

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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 Irish Water proposes to use for water resources planning, and an assessment of Need across Irish Water'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)	Irish Water'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 Irish Water 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

Irish Water 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. Irish Water 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.

Irish Water 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 Irish Water 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 West (RWRP-SW) is one of four regional plans that, along with the NWRP Framework Plan published in Spring 2021, comprise Ireland's first NWRP. Irish Water's NWRP will be the first such plan for the entire public water supply in Ireland. It will allow Irish Water 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 Irish Water 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 Irish Water's planning and investment cycles and form the basis of the NWRP.

The groupings (as seen in Figure 1.1) reflect Irish Water'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).

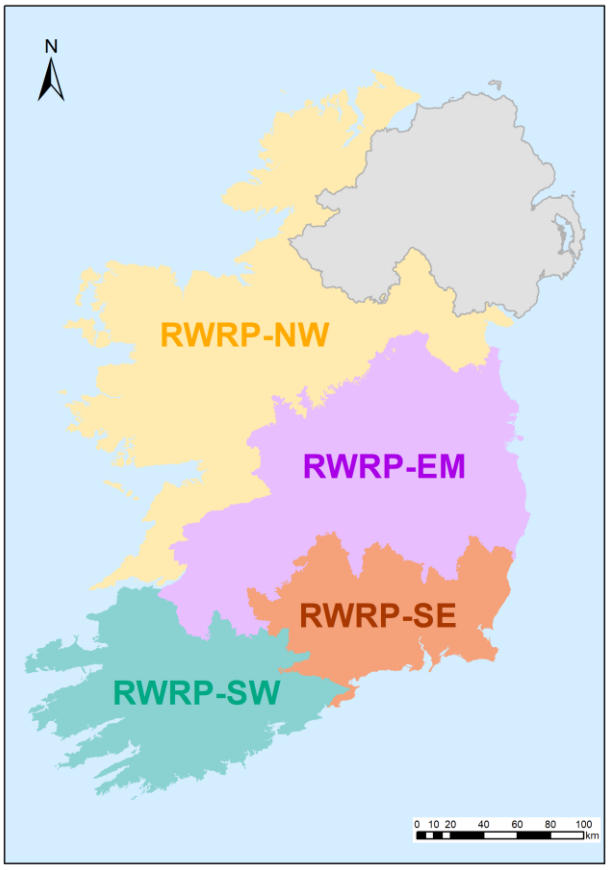

Figure 1.1 – Regional Groupings for Phase 2

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 Irish Water 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 Irish Water develops appropriate and sustainable interventions, that align with Irish Water's overarching three pillar approach (see Figure 1.2) to:

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

Together these pillars will enable Irish Water 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.

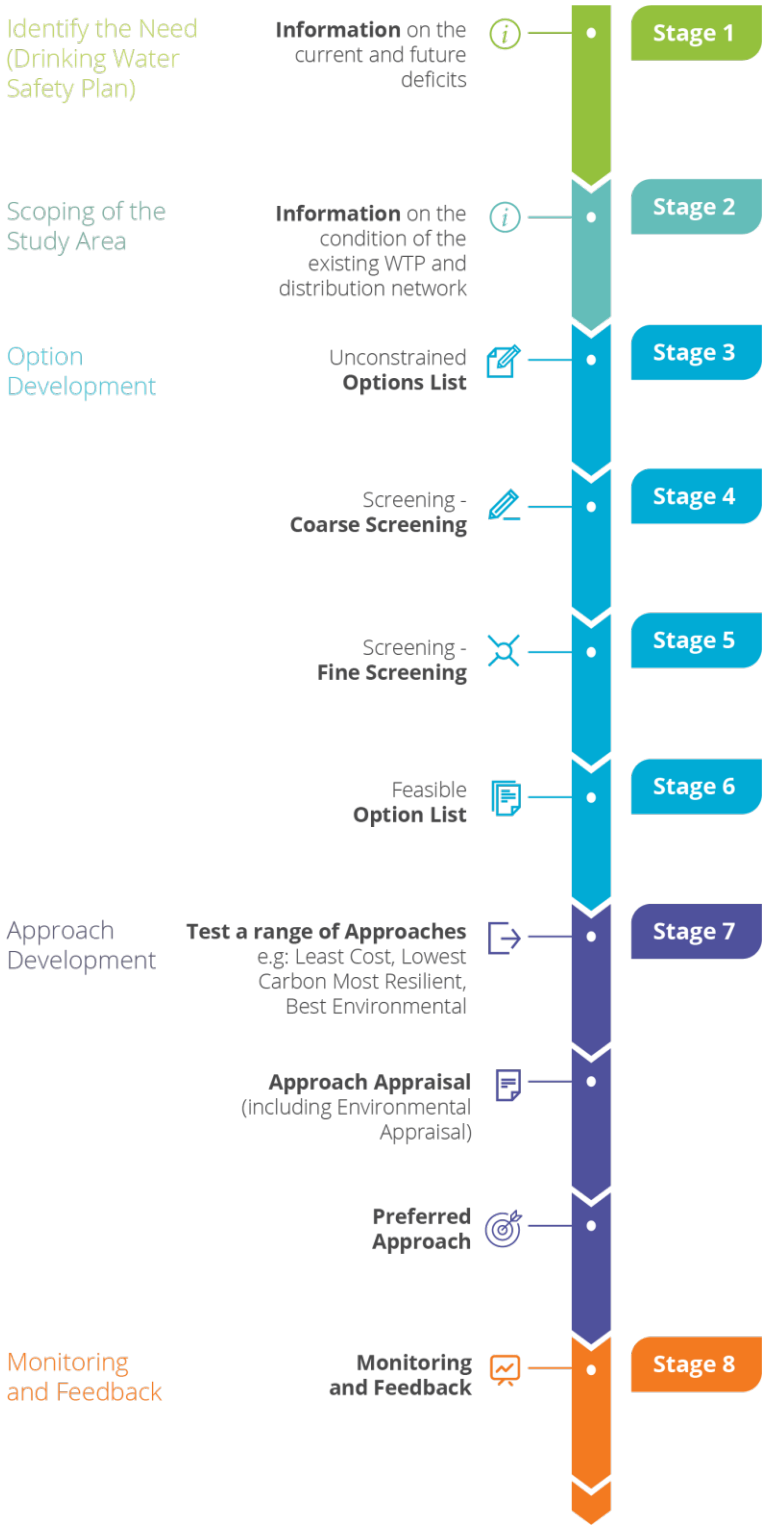

Figure 1.3 – Option Assessment Methodology Process

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, followed by the draft RWRP-SW, draft RWRP-NW and finally, the draft RWRP-SE. Consultation for each of the draft Regional Plans, and their accompanying NIS, will be undertaken sequentially in 2021, 2022 and 2023. This position was confirmed in the Regional Plan-specific screening for AA that Irish Water carried out in relation to the RWRP-SW, which again concluded that the management option types arising from the RWRP-SW had the potential to give rise to LSEs on European sites, in view of the sites' conservation objectives. Accordingly, AA of the RWRP-SW was considered to be required. The AA Screening Report for the RWRP-SW is provided at Appendix A of this NIS.

1.4 This Report

This is the NIS which has been prepared to support the AA of the RWRP-SW. This NIS has been prepared by Jacobs for Irish Water 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-SW lies with Irish Water. The NIS for the draft RWRP-SW was released for public consultation along with the draft RWRP-SW and other supporting documentation. The NIS will also be published alongside the final RWRP-SW and an AA Determination, which will set out the conclusions of the Appropriate Assessment carried out by Irish Water, 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 2011 Regulations). Irish Water is defined as a 'public authority' for the purposes of the 2011 Regulations.

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:

"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 42(6) states that:

"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".

[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] There are currently no SACs in Ireland. All remain 'candidate' Special Areas of Conservation (cSACs) 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.

In the context of Article 6(3), Irish Water must carry out screening for AA of the RWRP-SW 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 Irish Water must determine that an Appropriate Assessment of the plan is required.

To assist Irish Water in carrying out any Appropriate Assessment that may be required following screening, Irish Water 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 Irish Water 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 Irish Water;
- If appropriate, any written submissions or observations made to Irish Water in relation to the application for consent for the Plan; and
- Any other relevant information.

Following the Appropriate Assessment process, Irish Water must then only adopt the RWRP-SW 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-SW 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 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-SW;
- Ensure that identified significant effects are communicated, mitigated and that the effectiveness of mitigation is monitored;

[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).

- 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–SW, the SEA and the AA, such as sharing of baseline data where relevant, cohesive assessment of the potential ecological effects of the RWRP–SW on European sites, their qualifying features, and clarification on more technical aspects of the RWRP. These processes together will inform and shape the development of the RWRP–SW. Irish Water has prepared an Environmental Report for the purposes of SEA, which is being published for consultation along with this NIS and the RWRP-SW.

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

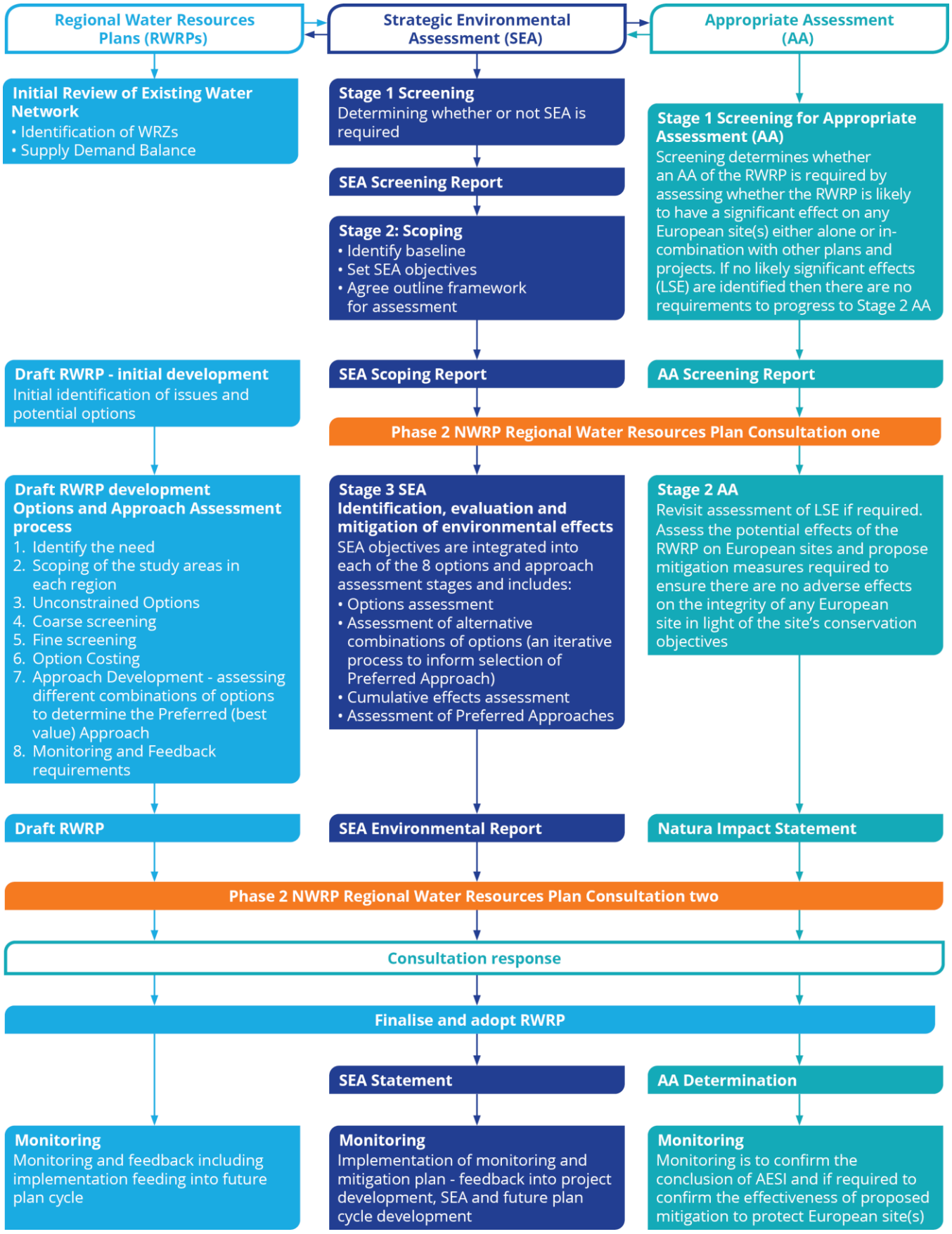

Figure 1.4 - RWRP development with SEA and AA process

1.7 Consultation

Irish Water presented the draft RWRP-SW for consultation alongside the draft NIS and the draft SEA Environmental Report. Irish Water have taken 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-SW will record how those submissions have informed the overall AA.

Consultation on the draft RWRP-SW was during the period 31st May through to the 23rd August 2022. Submissions in relation to AA made by email or post were accepted until Tuesday 23rd August 2022.

Email: nwrp@water.ie

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

Freephone: 1800 46 36 76

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

After the RWRP-SW consultation, Irish Water then commenced the drafting and consultation on the draft RWRPs for the remaining regions of North West and South East. Irish Water will apply the Options Assessment and Preferred Approach Methodology set out in the adopted Framework Plan to each water supply. This will allow Irish Water to develop a nationwide programme of short, medium and long-term options that we will present 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 the remaining Regional Water Resources Plans including corresponding SEA Environmental Reports and Natura Impact Statements has been or will be undertaken during 2022 and 2023.

2 Assessment Methodology

2.1 Stages of Appropriate Assessment

The methodology for undertaking assessment in relation to AA has evolved from European Commission guidance "Assessment of plans and projects significantly affecting Natura 2000 sites: Methodological guidance on the provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC" (November, 2001) 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).

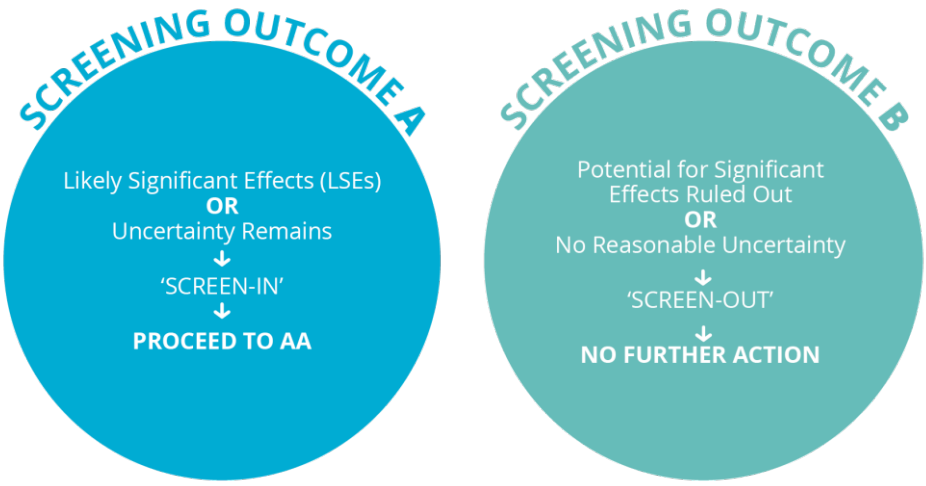

Figure 2.1 - Screening for Appropriate Assessment

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-SW, 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 Irish Water) 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-SW 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-SW 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-SW. To note, all of Irish Water's projects are screened for AA. Therefore, all projects arising from the RWRP-SW 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, January 2022)
[5] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:62002CJ0127 (Accessed, January 2022)

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-SW with the Habitats Directive

The RWRP-SW 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-SW is provided in Appendix A, and at a high level, assessed the option types that were likely to arise from the RWRP-SW; 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-SW concluded that the management option types arising from the RWRP-SW had the potential to give rise to LSEs on European sites, in view of the sites' conservation objectives. Accordingly, AA of the RWRP-SW 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-SW (see Appendix C).

2.3 Guidance documents in relation to Appropriate Assessment

The requirements of Article 6 of the Habitats Directive for the RWRP-SW have been applied having regard to the following the 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, 2021);
- 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-SW.

2.5 Consideration of the protection of European sites

The RWRP-SW 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

The Government is currently developing new legislation dealing with water abstractions, with the Water Environment (Abstractions and Associated Impoundments) Bill 2022 being published in September 2022. As this legislation is still undergoing the legislative process, and the associated regulations and guidance are not yet available, Irish Water does not yet have full visibility of the future regulatory regime. 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 Irish Water 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, Irish Water developed an initial list of unconstrained options for new supplies, increases and upgrades to existing supplies. An Unconstrained Options review workshop was held with Irish Water's Local Authority Water Services Partners to identify any additional unconstrained options that might be available based on local knowledge.

Irish Water 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. Irish Water considered abstraction sustainability in relation to identifying levels of sustainable abstraction. Irish Water 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 waterbody

[6] https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2009_AA_Guidance.pdf (Accessed, January 2022)
[7] https://www.opr.ie/wp-content/uploads/2021/03/9729-Office-of-the-Planning-Regulator-Appropriate-Assessment-Screening-booklet-15.pdf (Accessed, January 2022)

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 Irish Water must meet those criteria and are not otherwise considered as part of the Plan. As part of the Plan, Irish Water 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-SW. 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 Irish Water identify if these 0 scoring options meet the objectives of the RWRP-SW 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-SW 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-SW 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 SW region is provided in Appendix A and the LSEs are in Appendix C. A list of the European designated sites within the SW 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-SW. 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-SW 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 SW, 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 SW 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-SW to European sites in view of their conservation objectives.

2.6.2 Transboundary Effects

The RWRP–SW solely covers Irish Water's operational area for the South West which lies approximately 200km 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 European sites in NI and the SW 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);
- 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.

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-SW covers the South West region of the Republic of Ireland. Therefore, all European sites within this region (core baseline area – see Section 3.5 of the RWRP-SW 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-SW.

[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 SW Region

3.1 Special Areas of Conservation

SACs cover a variety of habitat types recognised in Annex I of the Habitats Directive. Nationwide, there are 439 SACs, in which 16 habitats are 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 Ireland. Some of the species for which SACs have been designated for in Ireland include, but are not limited to, Atlantic salmon (*Salmo salar*), shad (*Alosa fallax*), slender naiad (*Najas flexilis*), otter *(Lutra lutra*), lesser horseshoe bat (*Rhinolophus hipposideros*), freshwater pearl mussel (*Margaritifera margaritifera*) and Killarney fern (*Trichomanes speciosum*). Nine of the 16 priority habitats can be found in the SW region, and there are 53 SACs within the SW 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-SW. 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-SW to ensure the protection of these Annexed species and habitats. A full list of water dependent species and habitats in the SW 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 165 SPAs nationally, and 26 SPAs within the SW region. The majority of the SPAs located within the SW region are designated for wintering water birds and breeding seabirds/birds of prey with the majority considered to be regularly occurring migratory birds. Several passage migrants also occur at sites along the south coast, including *Sterna* species. Over 80% of the Annex I listed species that occur in the SW 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 SW region are included within SPAs and these

[10] The term 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 blanket bog and upland habitats within the SW region have also been designated as SPAs for wintering water birds. These sites provide important breeding and foraging areas for numerous other species including merlin (*Falco columbarius*) and golden plover (*Pluvialis apricaria*). Agricultural land is also represented within the SW 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 SW 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, January 2022)

- 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 West region

As discussed in Chapter 2, all European sites within the South West region were initially considered to be potentially within the ZoI of the RWRP-SW, therefore potential LSEs on the conservation objectives for these sites will be considered. There is a total of 53 SACs and 26 SPAs within the SW region. Two marine SACs, five marine SPAs and one terrestrial SAC are not within the SW region terrestrial boundary but are hydrologically linked to it. These sites are Kerry Head Shoal SAC, Magharee Islands SAC, Blasket Islands SPA, Skelligs SPA, Deenish Island and Scariff Island SPA, The Bull and The Cow Rocks SPA, Sovereign Islands SPA and Lower River Suir SAC. Table 3.1 below provides a breakdown of European sites within each Study Area within the SW region. A summary of the European sites within the SW region are shown in Figure 3.1 below.

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

Study Area	No. of SACs	No. of SPAs
H (Kerry)	16	10
I (Cork/South Kerry)	36	15
J (North Cork/West Waterford)	6	5

[12] https://www.npws.ie/protected-sites/conservation-management-planning/conservation-objectives (Accessed, January 2022)
[13] Some SACs or SPAs fall within more than one study area.

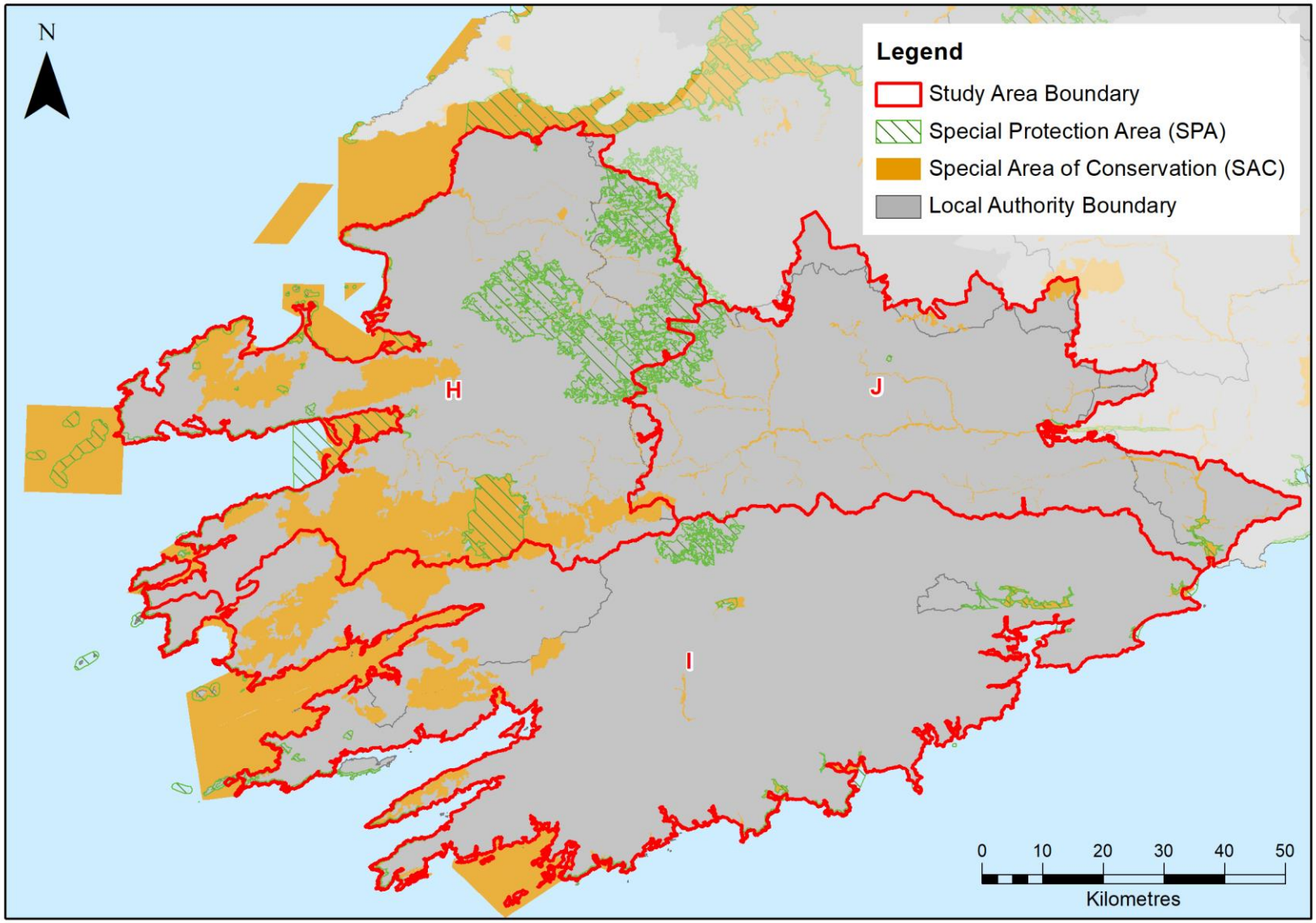

Figure 3.1 - European sites within the South West region

4 South West – Preferred Approach

4.1 Overview of South West

The RWRP-SW has identified the Preferred Approach for the SW region. The South West 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 SW 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-SW Plan and summarised in the relevant chapters below.

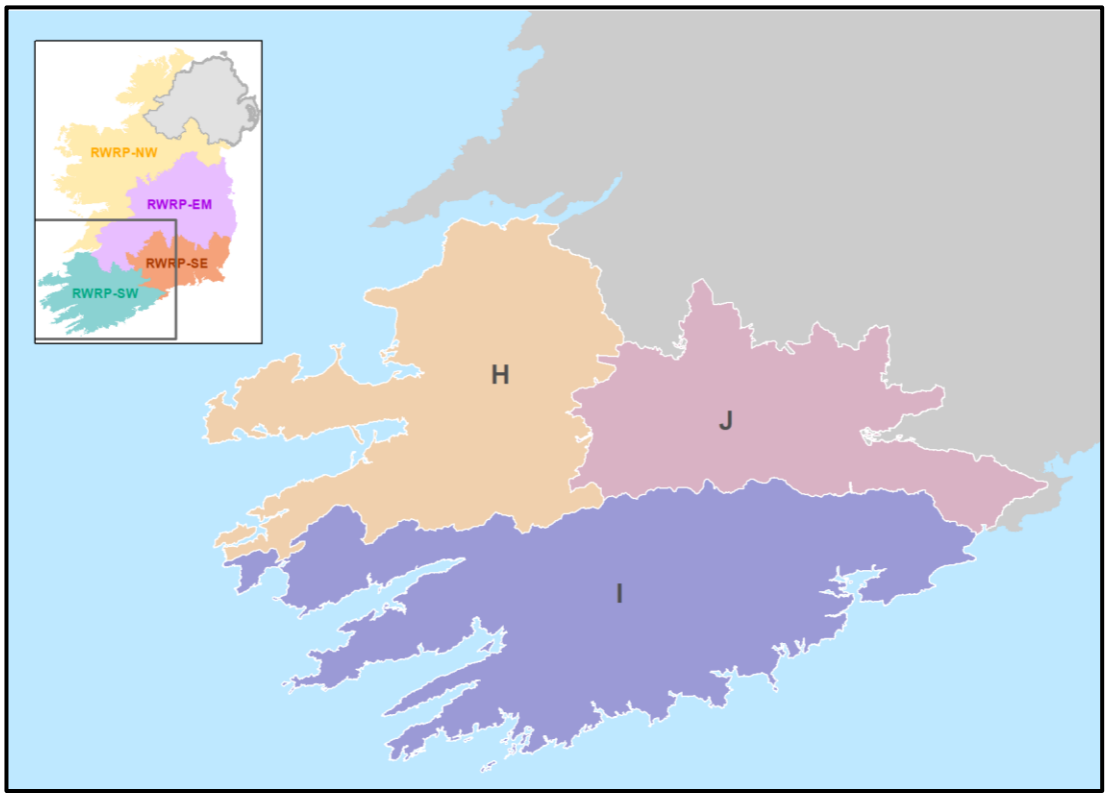

Figure 4.1 - Group Area 2 Study Areas

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, Irish Water 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 Irish Water 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-SW.

4.1.2 Water Conservation

At present, Irish Water 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, Irish Water will need to collect and monitor data over a number of years. Due to these data limitations, as part of this NWRP, Irish Water 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 SW 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 H – Kerry

The location of Study Area H (SAH) in relation to the SW region is shown in Figure 4.1 above. The majority of the Study Area is in County Kerry, with the northeast boundary in County Limerick. The total area of SAH is approximately 4,060km^2 and it lies within the counties Kerry, Limerick and Cork. The principal settlements (with a population of over 10,000) within SAH are Tralee and Killarney (Central Statistics Office, 2016).

There are sixteen SACs and ten SPAs within SAH as shown in Table 4.1. European sites within SAH where there is potential for LSE are discussed further in Section 6.2.1.

Table 4.1 - Number of European Sites within SAH

Study Area	No. of SACs	No. of SPAs
H (Kerry)	16	10

4.2.1 Existing Water Supplies

SAH consists of 23 WRZs supplying a population of approximately 125,225 people via approximately 2,479km of distribution network. The largest town is Tralee, whilst Killarney and Listowel are other areas of high demand within the Study Area. The Study Area is summarised in Figure 4.2 below. The sources of water supply consist of 26 surface water abstractions and 31 groundwater sources (approximately 50 individual boreholes).

Regarding surface water availability in the Study Area, SAH is split between the Laune-Maine-Dingle Bay catchment in the south, and the Tralee Bay-Feale catchment in the north. The Laune River catchment drains the southeast of the Study Area, passing through the large Lough Leane waterbody at Killarney,

before flowing out to sea at Dingle Bay. The River Feale catchment drains the northern part of the Study Area, as it flows through Abbeyfeale in Co. Limerick, before Listowel in Co. Kerry, and emptying into the Shannon Estuary at Cashen Bay. The Study Area includes the Dingle Peninsula and the northern side of the Iveragh Peninsula, which are drained by a series of small rivers.

Many of these surface waters are within designated areas, including the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and Castlemaine Harbour SAC in the south, and the Lower River Shannon SAC in the north of the Study Area. There are three designated freshwater pearl mussel sub-catchments (under freshwater pearl mussel regulations (S.I. 296 2009)) located within SACs in this region: Caragh and Gearhameen catchments within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC; and Owenmore catchment within the Mount Brandon SAC. Several river and lake water bodies within the Study Area have a WFD high ecological status objective: twenty-nine river water bodies and two lakes (Caragh and Muckross) within the Laune-Maine-Dingle Bay catchment; and four river water bodies within the Tralee Bay-Feale catchment.

Most of the water supplies for the Study Area come from a few large abstractions from surface water sources. The Central Regional WRZ is the largest water resource zone in SAH, covering the Tralee and Killarney high demand areas. To meet these demands, Central Regional has the most significant abstraction from the Lough Guitane source within the upper Laune catchment. The lake has an existing abstraction licence in place allowing an abstraction amount up to 12 million gallons per day (i.e. 54.54 Ml/d). Elsewhere in the Laune catchment, there are abstractions from the smaller Lough Callee and Gaddagh River sources for Mid Kerry WRZ. The River Feale catchment and its tributaries are an important supply source for the north of the Study Area. There are two abstractions in the upper catchment at Brosna and Abbeyfeale, another one from one of its main tributaries River Smearlagh, before the most significant abstraction downstream at Listowel before the Feale enters transitional waters. Elsewhere across the Study Area, including across the Dingle and Iveragh Peninsulas, the WRZ supplies are made up of combinations of smaller surface water and groundwater sources.

All other WRZs are groundwater supplies. The topography of County Kerry, and associated geological deposits, can be broadly split into the topographic highs of the Macgillycuddy’s Reeks just west of Killarney National Park and the Slieve Mish Mountains north of Dingle Bay. The higher topographic features have the sedimentary rocks of the Old Red Sandstones at or close to the surface in some parts. These sandstones also cover most of the southern half of the county. They are predominantly overlain by quaternary sediments of Till and raised Peat in the more upland areas. The most obvious lowland feature in the Study Area is the S-shaped “green belt” stretching from Ardfert to Killarney. Just south of the Study Area lies the broadly east-west trending syncline of Kenmare. The predominant bedrock in these areas are the Lower Carboniferous limestones (Dinantian Pure Unbedded Limestones) and generally have thick (5-10m) cover of Quaternary deposits. Finally, the centrally located uplands between Killarney and Farranfore, are underlain by Upper Carboniferous rocks dominated by shales and sandstones and these pose the least amount of potential from a groundwater resource perspective.

The karst forms a key regionally important aquifer in some areas, namely around Ardfert and Castlemaine. There are a number of sand and gravel aquifers throughout the Study Area; the Ardfert gravels from which the Ardfert South scheme currently abstracts, and the Killorglin gravels which currently have no abstractions taking place. The Old Red 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 15-20 metres 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.

Overall, 31 groundwater sources (approximately 50 individual boreholes/sources) are managed by Irish Water in the region, abstracting between 0.125Ml/d to 1.6Ml/d. The majority of abstractions taking place from the sandstones produce yields averaging 0.12 – 0.35Ml/d. The higher abstraction volume is from the Ardfert South borehole which is sited in a sand and gravel aquifer overlying Carboniferous limestone.

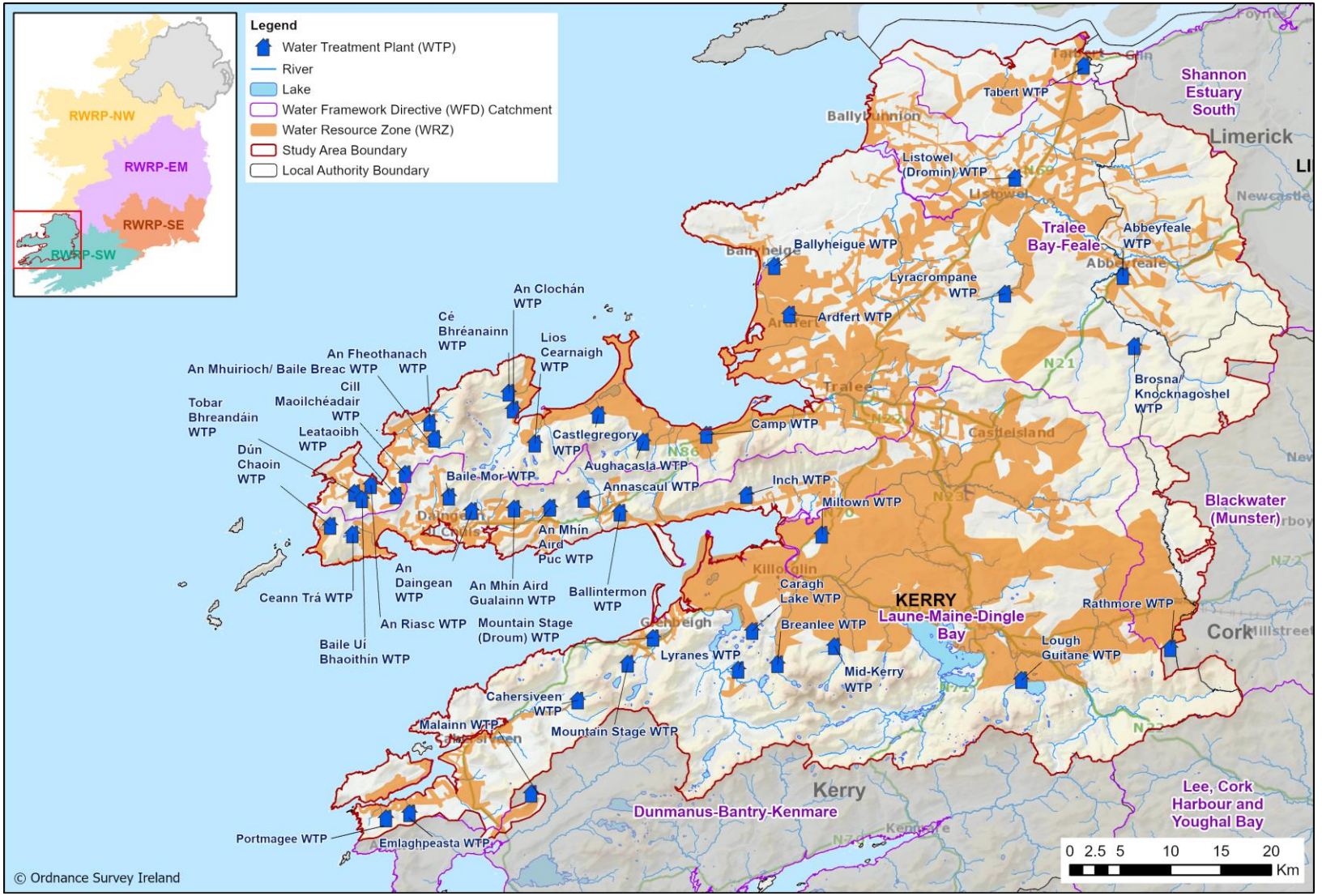

Figure 4.2 - Study Area H Kerry Summary

4.2.2 SAH Options Removed at Coarse Screening

The options detailed in Table 4.2 below were removed at Coarse Screening on environmental grounds.

Table 4.2 - SAH – Options removed at Coarse Screening on environmental grounds

Option Reference	Option Description	Rejection Reasoning
SAH-009	New connection from New Shannon Source via Newcastle West to supply deficit in Central Regional.	The New Shannon Source (NSS) has only a certain amount of yield available. It has already been identified as a suitable source for WRZ's which are closer to it. North Kerry is a considerable distance from the NSS and crosses complex terrain.
SAH-010	Increase SW abstraction from Owgarriff River.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-012	Recommission old Torc source (previously used to feed Killarney).	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-013	Recommission old Curraheen source - SW (previously used to feed Tralee).	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-015	New connection from New Shannon Source to feed WRZ in deficit in North of Kerry.	The NSS has only a certain amount of yield available. It has already been identified as a suitable source for WRZ's which are closer to it. North Kerry is a considerable distance from the NSS and crosses complex terrain.
SAH-017	Increase SW abstraction from the Gaddagh River and Upgrade WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-018	Increase SW abstraction from Lough Callee and Upgrade Gearha WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-022	New SW abstraction from Lough Yganavan.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-024a	Increase existing abstraction and supply Mid Kerry.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.

SAH-024	Increase existing abstractions and connect to Mountain Stage PWS WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-029	Increase SW abstraction from Garfinny River and upgrade An Daingean WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-030	Increase GW abstraction from Garfinny Springs and upgrade An Daingean WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-031	New GW abstraction from Connor Hill Spring (Disused Source) and upgrade An Daingean WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-033	New SW abstraction from Loch Ui Fhiannachta and upgrade An Daingean WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-035	New impoundment at Garfinny.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-040	New GW abstraction from Tiershanaghan Well (local important aquifer) - disused source - and new WTP.	There is a great uncertainty around available yield due to lack of data and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-041	New GW abstraction from Causeway Well - disused source - and upgrade Ballyheigue WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-042	New SW abstraction from Lough Akeragh and upgrade Ballyheigue WTP.	This option recommends a new SW abstraction from Lough Akeragh. Not a viable option as the lake no longer exists.
SAH-051	Supply deficit from Waterville WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-051a	Interconnect with Waterville PWS.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-054	Increase abstraction from Coulough Stream.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.

SAH-055	Conjunctive use - Increase abstraction from Coulough Stream and increase abstraction from BH - Conversion of existing trial to production wells.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-056	New SW abstraction from Coomaglaslaw Lake.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-057	New SW abstraction from Coomnacronia Lake.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-058	New SW abstraction from Carhan River 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 good WFD status.
SAH-063	Increase SW abstraction from Stradbally River and upgrade existing Castlegregory 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 good WFD status.
SAH-066	Increase SW abstraction from Lateeve River and upgrade Portmagee WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-069	Increase SW abstraction from Maulin River and upgrade Málainn WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-070	Increase GW abstraction from Emlaghpeasta BH and upgrade Emlaghpeasta WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-078	Abandon Mountain Stage Drom WTP and connect to Mountain Stage.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-079	Increase GW abstraction at Drom Well and upgrade WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-080	Increase SW abstraction from Coomaglaslaw Lake and upgrade WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.

SAH-081	Increase SW abstraction from Maithegarbh River and upgrade WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-082	New SW abstraction at Windy Gap Intake (Disused Source) and new WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-083	New SW abstraction from the Gowlane River (Disused Source) and new WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-086	Increase GW at Tobar Tollta Leataoibh and upgrade Leataoibh WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-087	Increase GW abstraction from An Riasc WTP (local important aquifer) and upgrade An Riasc WTP.	This option recommends increasing the abstraction at An Riasc to supply deficit. There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-088	New GW from Kerry Spring Water BH.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-089	Increase GW abstraction from Caherdorgan (local important aquifer) - spring source - and upgrade Cill Maoilchéadair WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-093	Increase SW abstraction from Mount Eagle Lake and upgrade Ceann Tra PWSS WTP - 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 good WFD status.
SAH-095	New GW abstraction from Glenfahan Spring (Disused stream source) with New WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-096	New SW abstraction from Fahan Intake (Disused stream source) with New WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-097	Increase GW abstraction from Gowlane Springs and upgrade An Mhín Aird Gualainn WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage

		and would not be taken forward to the fine screening stage.
SAH-098	Increase SW abstraction from Gowlane Stream and upgrade An Mhín Aird Gualainn WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-101	New SW abstraction from Banoge River (disused source) and upgrade An MhÍn Aird Puc Banogue WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-111	Supply Rathmore from Millstreet.	Millstreet is in deficit, and it will be assessed as part of Study Area J. This option would involve in excess of 10km required for <1MLD deficit in Rathmore. Transferring small quantities of water over long distances can affect the quality of water.
SAH-111a	Supply Rathmore.	Millstreet in deficit and will be assessed as part of Study Area J. In excess of 10km required for <1MLD deficit in Rathmore. Transferring small quantities of water over long distances can affect the quality of water.
SAH-114	Increase GW abstraction from Baile Breac Springs and upgrade An Mhuirioch/ Baile Breach WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-115	Increase GW abstraction from Baile Breac High Spring and upgrade An Mhuirioch/ Baile Breach WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-117	Increase GW abstraction from BH at reservoir site and upgrade An Mhuirioch/ Baile Breach WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-119	New GW abstraction from Tobar Tollta Baile Reo (Disused BH source) and upgrade An Fheothanach WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-124	Increase GW abstraction with 1 new BH. (Currently 1 Spring source). Interconnect to Ballyferiter, Ceann tra/Ventry WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-124a	Connect Baile An Fheirtearaigh / Tir Abhainn Thoir / Cill Maoilcheadair / An	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage

	Ghraig/Cloichear to Dun Chaoin.	and would not be taken forward to the fine screening stage.
SAH-124b	Connect Ceann Tra PWS 074D to Dun Chaoin.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-144	Increase GW abstraction from Ballintermon BH (local important aquifer) and upgrade Ballintermon WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-146	Rationalisation of Ballintermon WTP and feed from Inch.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-146a	New GW close to Inch and supply Anascaul.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-149	Rationalise and connect to Breanlee - Mid Kerry.	The option requires a significant length of pipeline for a relatively very small supply. Transferring small quantities of water over long distances can affect the quality of water. There are other viable alternative option for this WRZ.
SAH-149a	Increase SW abstraction at Breanlee and supply Lyranes.	The option requires a significant length of pipeline for a relatively very small supply. Transferring small quantities of water over long distances can affect the quality of water. There are other viable alternative option for this WRZ.
SAH-150	Increase SW abstraction from Feale and upgrade Listowel WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-152	Rationalise Tarbert and feed from Listowel. Increased abstraction from Smearlagh to offset.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-154	New GW abstraction at Inch WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-157	Increase SW abstraction from River Feale and upgrade Abbeyfeale WTP. Known issues at critical periods -	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.

	lower intake required potentially.	
SAH-159	New SW abstraction from River Allaghaun - abstraction point TBC and new WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-160	Supply deficit from neighbouring Brosna GWS (Kerry) (network upgrades required).	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-163	Rationalise Abbeyfeale to Newcastle West WRZ (approx. distance 3.5km, new watermains and network upgrades required).	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-163a	Supply Abbeyfeale from South West Regional.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-164	Interconnect Abbeyfeale and Newcastle West WRZs (approx. distance 3.5km, new watermains and network upgrades required) for increased resilience and supply deficit.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-164a	Supply Abbeyfeale from South West Regional	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAH-165	Interconnect Abbeyfeele Water Supply with New Shannon Source.	The option requires a significant length of pipeline for a relatively very small supply. Transferring small quantities of water over long distances can affect the quality of water. There are other viable alternative option for this WRZ.
SAH-193	New SW abstraction from Coomnacronia Lake.	It was determined that the sustainable allowable abstraction at this location is above the 5% allowable limit provided in the UKTAG guidance. Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-205	New 120ML raw water bankside reservoir storage at existing River Feale abstraction site to provide up to 1 week supply for DYCP low flow periods when river abstraction rates reduced.	New 120 ML storage would only provide up to one week supply, and so it is not resilient long term for Dry Year Critical Periods. Three month storage would be required for resilience and is not feasible at this size to meet the small demand requirement.

SAH-206	New SW abstraction from River Galey, connection to existing WTP.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-207	New SW abstraction from River Brick, new WTP and connection to network.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAH-226	New SW abstraction from Lough Cruite, including new WTP and network.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.

4.2.3 Preferred Approach for SAH

Full details of the Preferred Approach (and how it was reached) are included in the SAH Technical Report in Appendix 1 of the RWRP-SW. The final Preferred Approach for SAH is shown in Table 4.3 below. The findings of the Preferred Approach Development for SAH Kerry include the following:

- Four options 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; one is associated with Group options SAH-530 and SAH-540, and the other with option SAH-170.
- The remaining options within the Preferred Approach have either a -1 or a -2 score against European sites.

In summary, the Preferred Approach (Combination 9 - Group 12, 24, 30, 31, 33 & 40) consists of local WRZ supplies for 14 of the 23 WRZs in the Study Area, primarily driven by the small scale of the supplies and difficulties in transporting small volumes of water over long distances.

The nine other WRZs in SAH involve constructing connections across one or more supplies. The preferred approach for Ce Bhreannain involves increasing groundwater abstraction at An Clochan and increasing connection between the two schemes. The preferred approach for Listowel and Abbeyfeale involves developing groundwater in the gravels between the two WRZs and interconnecting them. The preferred approach for Central Regional and Mid Kerry involves developing a new source in the lower Leane catchment and interconnecting the two schemes. The Preferred Approach for Cahersiveen, Emlaghpeasta, Portmagee and Maulin involves rationalising these schemes to Waterville and increasing abstraction from the existing Lough Currane source. The Preferred Approach for Dun Chaoin and Baile an Fheirtearaigh WRZs looks at increasing groundwater abstraction from Tobar Bhreandáin WTP boreholes and supplying Dun Chaoin. Finally, the preferred approach for Rathmore involves rationalising the scheme to Central Regional.

There is just one -3 score associated with Groups SAH-530 and SAH-540 which relates to the connection to Central Regional and Mid Kerry WRZs, the new abstraction for which is from the lower Leane catchment. The reason for the single -3 score is that this is the same abstraction across these two grouped preferred approaches, and as such is assessed as a single impact. The combined proposed abstraction from the two groups is approximately 26 Ml/d which is calculated at 2% of Q50 and is reflected like this in the assessment.

The Preferred Approach will result in a reduction of WRZs from 23 to 16. Two of the existing 57 abstractions in SAH are proposed to be decommissioned, providing environmental benefit.

The Preferred Approach for SAH Kerry also includes 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).
- Netleakage reduction, amounting to 1.07Ml/d (applied to SDB Deficit) to move towards achieving the National SELL Target by 2034.
- Continuation of Irish Water 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 a number of WTPs (for example Cahersiveen WTP and Rathmore WTP) which currently extract from European sites including Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC and 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 4.3 and shown in Figure 4.3.

Table 4.3 - Final Preferred Approach for SAH – Options

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAH-162 **(Part of Grouped Option SAH-524)** 1900SC0021 Abbeyfeale Water Supply	-2	**New GW abstraction and interconnect Abbeyfeale and Listowel Regional WRZs (approx. distance 1km, new watermains and network upgrades required) for increased resilience and supply deficit** • New GW abstraction to meet WRZ future deficit • WRZ current WAFU Dry Year Critical Period (DYCP) 2044 = 2.567Ml/d, DYCP 2044 demand = 3.497Ml/d so additional 0.926Ml/d required to meet WRZ deficit • New GW source (Ballybunnion GWB). WFD status 2016-2021 – Good
SAH-179 1300SC0004 An Baile Mor / An Daingean	0	**New SW abstraction from Milltown River and WTP** • New SW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 2.882Ml/d, DYCP 2044 demand = 3.338Ml/d so additional 0.456Ml/d required to meet WRZ deficit • New SW source (Milltown R Kerry). WFD status 2016-2021 – Moderate
SAH-108 **(Part of Grouped Option SAH-512)** 1300SC0008 An Clochan	-1	**Increase GW abstraction at An Clochan. Ce Brennan and Clochan are connected - Could feed from either depending on where yield is** • Increase GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.111Ml/d, DYCP 2044 demand = 0.365Ml/d so additional 0.253Ml/d required to meet WRZ deficit • Existing GW source (Brandon Head GWB) WFD status 2016-2021 – Good
SAH-122 1300SC0007 An Fheothanach/ An Mhuirioch/ Baile Breach	-1	**Amalgamate all sources in WRZ to one WTP and rationalise smaller WTP - Upgrade an Fheothanach WTP** • Increase GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.751Ml/d, DYCP 2044 demand = 0.783Ml/d so additional 0.032Ml/d required to meet WRZ deficit • Existing GW source (Brandon Head GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAH-099 1300SC0003 An Mhin Aird	0	**New GW abstraction in Dingle area to serve the customers currently served by An Mhín Aird Gualainn WTP** • New GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 1.045Ml/d, DYCP 2044 demand = 1.45Ml/d so additional 0.405Ml/d required to meet WRZ deficit • New GW source (Dingle GWB) WFD status 2016-2021 – Good
SAH-173 1300SC0002 Annascaul / Ballintermon	-1	**WTP Upgrade - No deficit** • WRZ in surplus. Rationalise Ballintermon to Annascaul • WRZ current WAFU DYCP 2044 = 0.737Ml/d, DYCP 2044 demand = 0.524Ml/d so surplus 0.213Ml/d to supply Ballintermon WRZ deficit • Existing GW source (Dingle GWB) WFD status 2016-2021 – Good
SAH-038 1300SC0010 Ardfert North/ Glenderry Ballyheigue WRZ	-2	**Increase Ballyheigue GW abstraction. Abandon existing borehole (BH) at Glenderry Well and rationalise WTP** • Increase GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 1.879Ml/d, DYCP 2044 demand = 4.212Ml/d so additional 2.333Ml/d required to meet WRZ deficit • Existing GW source (Ardfert GWB) WFD status 2016-2021 – Good
SAH-138 1300SC0030 Aughacasla	-1	**New GW abstraction from Aughacasla BHs and upgrade existing Aughacasla WTP to supply deficit. Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones** • New GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.528Ml/d, DYCP 2044 demand = 0.532Ml/d so additional 0.004Ml/d required to meet WRZ deficit • New GW source (Brandon Head GWB) WFD status 2016-2021 – Good
SAH-187 **(Part of Grouped Option SAH-533)**	-2	**Increase GW abstraction from Tobar Bhreandáin WTP BH (local important aquifer) and upgrade Tobar Bhreandáin WTP** • Increase GW abstraction to meet WRZ future deficit

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
1300SC0005 Baile An Fheirtearaigh / Tir Abhainn Thoir / Cill Maoilcheadair / An Ghraig/Cloichear		• WRZ current WAFU DYCP 2044 = 1.173Ml/d, DYCP 2044 demand = 1.64Ml/d so additional 0.467Ml/d required to meet WRZ deficit • Existing GW source (Brandon Head GWB) WFD status 2016-2021 – Good
SAH-225 1300SC0012 Brosna/Knocknagoshel PWSS 016F	-2	**New GW abstraction. Develop trial well (TW) at Brosna raw water pump house** • New GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 1.54Ml/d, DYCP 2044 demand = 1.793Ml/d so additional 0.253Ml/d required to meet WRZ deficit • New GW source (Abbeyfeale GWB) WFD status 2016-2021 – Good
SAH-182 **(Part of Grouped Option SAH-531)** 1300SC0032 Cahersiveen	-2	**Increase SW abstraction. Rationalise Cahersiveen to Waterville, with Lough Currane abstraction increased to meet deficit** • Increase SW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.151Ml/d, DYCP 2044 demand = 1.815Ml/d so additional 1.664Ml/d required to meet WRZ deficit • Existing SW source (Currane SWB) WFD status 2016-2021 – Moderate
SAH-065 1300SC0009 Castlegregory PWSS 024D	-2	**New SW abstraction from Lough Gill and upgrade Castlegregory WTP** • New SW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.108Ml/d, DYCP 2044 demand = 1.167Ml/d so additional 1.059Ml/d required to meet WRZ deficit • New SW source (Lough Gill SWB) WFD status 2016-2021 – Moderate
SAH-108a **(Part of Grouped Option SAH-512)** 1300SC0028 Ce Bhreannain	-1	**Increase GW abstraction at An Clochan. Ce Brennan and Clochan are connected - Could feed from either depending on where yield is** • Increase GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.178Ml/d, DYCP 2044 demand = 0.22Ml/d so additional 0.042Ml/d required to meet WRZ deficit

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
		• Existing GW source (Brandon Head GWB) WFD status 2016-2021 – Good
SAH-094 1300SC0022 Ceann Tra PWS 074D	0	**Increase GW abstraction from Ceann Trá WTP BHs (Local important aquifer) and upgrade Ceann Trá WTP** • Increase GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.283Ml/d, DYCP 2044 demand = 0.796Ml/d so additional 0.514Ml/d required to meet WRZ deficit • Existing GW source (Dingle GWB) WFD status 2016-2021 – Good
SAH-177 **(Part of Grouped Option SAH-530)** 1300SC0013 Central Regional - Lough Guitane	-3	**New SW abstraction from the lower Leane catchment and WTP at abstraction to feed deficit in Central Regional and Mid Kerry** • New SW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 43.516Ml/d, DYCP 2044 demand = 58.674Ml/d so additional 15.158Ml/d required to meet WRZ deficit • New SW source (Leane LWB) WFD status 2016-2021 – Good
SAH-186 **(Part of Grouped Option SAH-533)** 1300SC0006 Dun Chaoin PWS 034D	-2	**Increase GW abstraction from Tobar Bhreandáin WTP BH and supply Dun Chaoin** • Increase GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.065Ml/d, DYCP 2044 demand = 0.229Ml/d so additional 0.164Ml/d required to meet WRZ deficit • Existing GW source (Dingle GWB) WFD status 2016-2021 – Good
SAH-204 **(Part of Grouped Option SAH-531)** 1300SC0016 Emlaghpeasta / Portmagee / Maulin	-2	**Rationalise Emlaghpeasta to Waterville, with Lough Currane abstraction increased to meet deficit** • Increase SW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.486Ml/d, DYCP 2044 demand = 1.112Ml/d so additional 1.599Ml/d required to meet WRZ deficit • Existing SW source (Currane SWB) WFD status 2016-2021 – Moderate

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAH-169 1300SC0026 Lios Cearnaigh PWS 052D	0	**Not in deficit- upgrade WTP** • WRZ in projected surplus • WRZ current WAFU DYCP 2044 = 0.132Ml/d, DYCP 2044 demand = 0.084Ml/d so surplus of 0.048Ml/d • Existing GW source (Brandon Head GWB) WFD status 2016-2021 – Good
SAH-162a **(Part of Grouped Option SAH-524)** 1300SC0011 Listowel Regional PWS	-2	**New GW abstraction and interconnect Abbeyfeale and Listowel** • New GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 14.038Ml/d, DYCP 2044 demand = 16.427Ml/d so additional 2.389Ml/d required to meet WRZ deficit • New GW source (Ballybunnion GWB). WFD status 2016-2021 – Good
SAH-148 1300SC0024 Lyranes 303A	-2	**Increase GW abstraction from source Lyranes BH (local important aquifer) and upgrade Lyranes WTP** • Increase GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.044Ml/d, DYCP 2044 demand = 0.062Ml/d so additional 0.018Ml/d required to meet WRZ deficit • Existing GW source (Cahersiveen GWB) WFD status 2016-2021 – Good
SAH-178 **(Part of Grouped Option SAH-530)** 1300SC0015 Mid Kerry	-3	**New SW abstraction from the lower Leane catchment and WTP at abstraction to feed deficit in Central Regional and Mid Kerry** • New SW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 3.581Ml/d, DYCP 2044 demand = 13.799Ml/d so additional 10.218Ml/d required to meet WRZ deficit • New SW source (Leane SWB) WFD status 2016-2021 – Good
SAH-170 1300SC0025 Mountain Stage PWS 062A	-3	**New SW abstraction from Coomassaharn Lake, upgrade Mountain Stage WTP to treat** • New SW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 0.856Ml/d, DYCP 2044 demand = 1.372Ml/d so additional 0.516Ml/d required to meet WRZ deficit • New SW source (Coomassaharn SWB) WFD status 2016-2021 – High

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAH-215 **(Part of Grouped Option SAH-540)** 1300SC0031 Rathmore	-3	**Rationalise Rathmore WTP and connect to Central Regional. Note: the new SW abstraction from the lower Leane catchment included in this option is the same new SW abstraction included in SAH-530, and so there is only one abstraction associated with options SAH-530 and SAH-540** • Dependent on group SAH-530 (New source for Central and Mid Kerry) • WRZ current WAFU DYCP 2044 = 0.663Ml/d, DYCP 2044 demand = 0.78Ml/d so additional 0.117Ml/d required to meet WRZ deficit • New SW source (Leane SWB) WFD status 2016-2021 – Good
SAH-181 **(Part of Grouped Option SAH-531)** 1300SC0023 Waterville (SAI)	-2	**Increase abstraction from Lough Currane and supply Cahersiveen and Emlaghpeasta** • Increase SW abstraction to meet WRZ future deficit and allow schemes in SAH to be rationalised • WRZ current WAFU DYCP 2044 = 1.826Ml/d, DYCP 2044 demand = 1.811Ml/d so surplus in WRZ of 0.015Ml/d. Increase required to rationalise the 2 schemes in SAH • Existing SW source (Currane SWB) WFD status 2016-2021 – Moderate

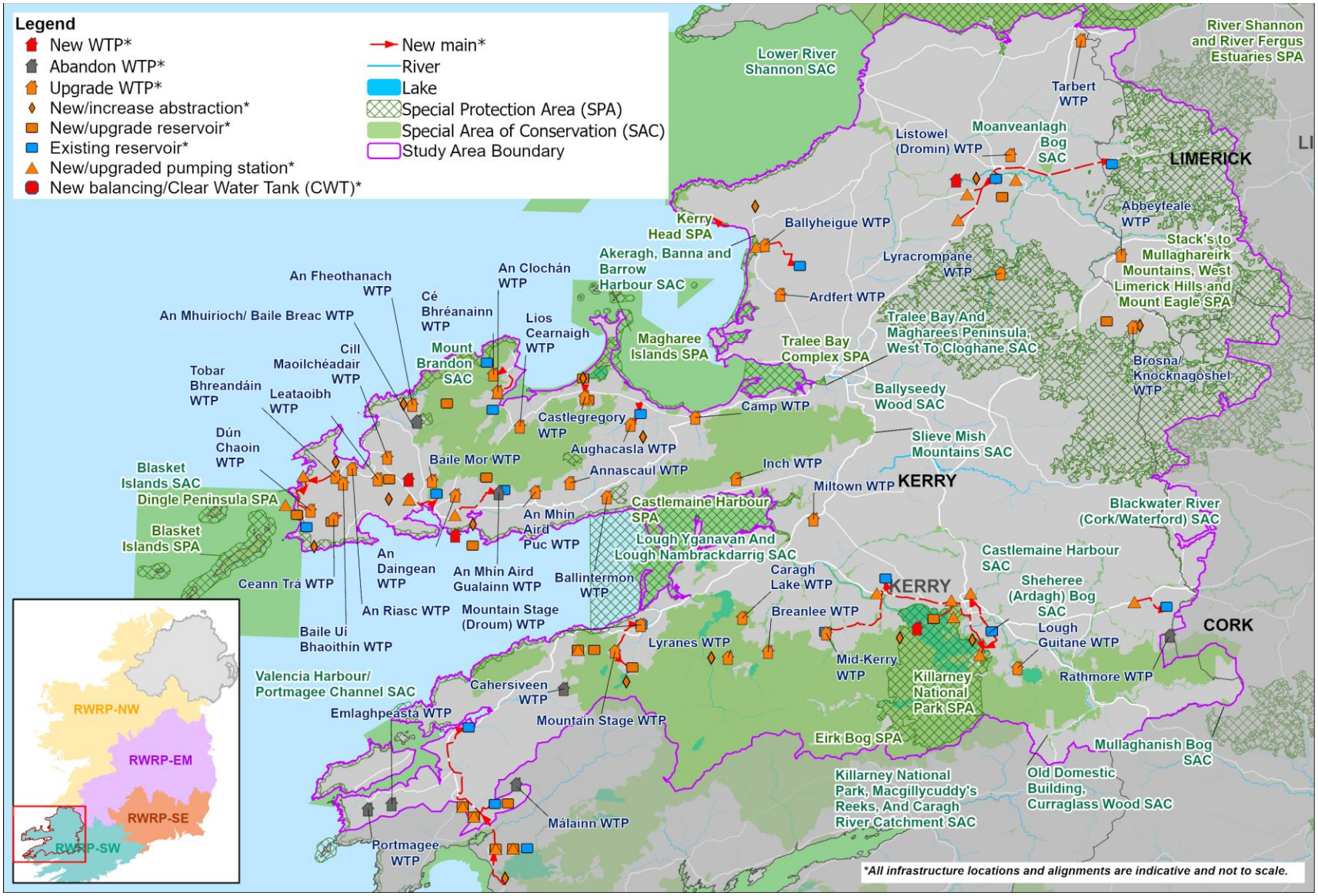

Figure 4.3 - Study Area H – Preferred Approach and European sites

4.3 Overview of Study Area I – Cork/South Kerry

The location of Study Area I (SAI) in relation to the SW region is shown in Figure 4.1 above. The Study Area extends across the southern tip of the country from the Iveragh Peninsula in the south of County Kerry to Youghal in the east of County Cork. The total area of SAI is approximately 5,920km^2 and it lies within the counties of Cork, Kerry and Cork City. The principal settlements (with a population of over 10,000) within SAI are Cork city and suburbs, Carrigaline, Cobh and Midleton (Central Statistics Office, 2016).

There are thirty-six SACs and fifteen SPAs within SAI as shown in Table 4.4. European sites within SAI where there is potential for LSE are discussed further in Section 6.2.2.

Table 4.4 - Number of European Sites within SAI

Study Area	No. of SACs	No. of SPAs
I (Cork/South Kerry)	36	15

4.3.1 Existing Water Supplies

SAI consists of 89 WRZs supplying a population of approximately 390,000 people via approximately 3,776km of distribution network. The western regions can be classified as highly rural / remote areas to rural areas with moderate urban influence with some independent urban towns. The central and eastern parts can be classified as rural areas with high urban influence with city and satellite urban towns. Cork City and its environs represents the main demand centre, with other large towns elsewhere in the study area including Clonakilty, Skibbereen and Bandon. The sources of water supply include 44 surface water and 66 groundwater sources (91 groundwater abstractions). The Study Area is summarised in Figures 4.4a and 4.4b below.

Regarding surface water availability in SAI, the Study Area stretches across three WFD catchments: the Lee, Cork Harbour and Youghal Bay in the northeast; the Bandon-Ilen in the south; and the Dumanus-Bantry-Kenmare in the west. The Lee, Cork Harbour and Youghal Bay catchment includes the area drained by the River Lee and all streams entering the tidal water in Cork Harbour and Youghal Bay and between Knockaverry and Templebreedy Battery in County Cork. The River Lee rises in the Shehy Mountains in west County Cork on the border of County Kerry and flows east through Cork City entering the Celtic Sea at Cork Harbour. The ESB developed a hydro-electric scheme on the River Lee in the 1950s, constructing two impounding reservoirs Carrigadrohid and Inniscarra. The Bandon-Ilen catchment includes the areas drained by the Rivers Bandon and Ilen and streams entering tidal water between Templebreedy Battery and Mizen Head in County Cork. The Dunmanus-Bantry-Kenmare catchment includes the area drained by all streams entering tidal water in Dunmanus, Bantry and Kenmare Bays between Mizen Head and Glanearagh Head in County Kerry.

The majority of all of the water supplies for the Study Area come from seven large surface water abstractions and over 50% of the total supply comes from two significant abstractions from the River Lee source: an intake from the Inniscarra Reservoir which supplies Inniscarra WTP (the third biggest plant in the country); and an abstraction further downstream directly from the River Lee which feeds Lee Road WTP at Cork City. The other notable surface water supply sources in SAI involve river abstractions at Glashaboy River (Glashaboy WTP), River Bandon (Innishannon and Carhue WTPs), Argideen River (Clonakilty WTP), River Ilen (Ballyhilty WTP), and Owencurra River (Tibbetstown and Midleton WTPs). There are several abstractions from small lake sources, mainly located in the more mountainous western parts of the Study Area, however these supply much smaller quantities than the discussed river sources, and with the exception of the large Inniscarra Reservoir source on the River Lee, there is generally a

limited amount of natural or artificial surface water storage in the Study Area in comparison to other parts of the country.

Some of the surface water sources in the western parts of the Study Area in County Kerry are within designated areas. These designations include the large Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, the Glanmore Bog SAC, the Caha Mountains SAC, and the Maulagowna Bog SAC. In addition, two surface water sources are within designated freshwater pearl mussel SAC catchments - the Bandon/ Caha and Ownagappul catchments.

In regard to groundwater, the predominant aquifer type of the area is made up of poorly productive bedrock (95%), followed by karstic (4%) and gravel (0.6%). There are no major productive fissured aquifers mapped in SAI. Although there are more groundwater abstractions than surface water, the majority occur in the lesser productive sandstones, hence the reliance on some of the larger river sources mentioned above.

Devonian Old Red Sandstone consist mainly of coarse and fine sandstones, siltstones, shales, and conglomerates, and along with the Dinantian Mudstones and Sandstones, make up the dominant bedrock geology in SAI. These rocks 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 15-20 metres of the aquifer, with levels generally mirroring topography, although deeper flows along fault zones or connected fractures are encountered which can provide higher yields. Significant flows can be found at springs issuing from bedding planes marking a change in lithology.

The karst forms a key regionally important aquifer in some areas, namely around the low-lying valleys, stretching from Ballincollig west of Cork city eastwards to Youghal. The Southern Region is predominantly characterised by a more diffuse network of flow pathways (Regionally Important Karstified Bedrock type aquifers), where the distribution of permeability, and hence yield, is more homogenous. These limestones are characterised by a general absence of surface drainage. There are sinking streams, springs emerging from caves, numerous extensive cave systems (Cloyne Caves, Poulnahorka Caves and Knockane Cross Caves, Castlemartyr), sinkholes and other collapse features. A number of large springs are found in the Waulsortian limestones, such as Dower Spring, which is used for public water supply for Whitegate Regional supplying in the region of 4.5 – 6Ml/d.

There are a number of locally important sand and gravel aquifers in the region, namely at Brinny and along the River Lee. The gravel aquifer at Brinny, on the Bandon River, has been exploited by industry since about 1974. GSI well records indicate six ‘excellent’ wells abstracting from the gravels at Brinny, and one ‘good’ well with a yield of 0.327Ml/d. The majority of the smaller abstractions take place from the sandstones, producing yields averaging 0.12 – 0.35Ml/d.

Due to relatively low volumetric requirements within the smaller water resource zones in SAI, these groundwater sources, with the necessary WTP and borehole upgrades, may be sufficient to meet average local needs. The higher abstraction volumes generally take place in the karst, with larger flows a result of a higher degree of karstification, which enhances secondary permeability by the enlargement of fractures, fissures and cavities by chemical solution. These karstic springs can at times provide very large overflows, and under the GSI classification scheme, would be regarded as large springs (>2.16Ml/d).

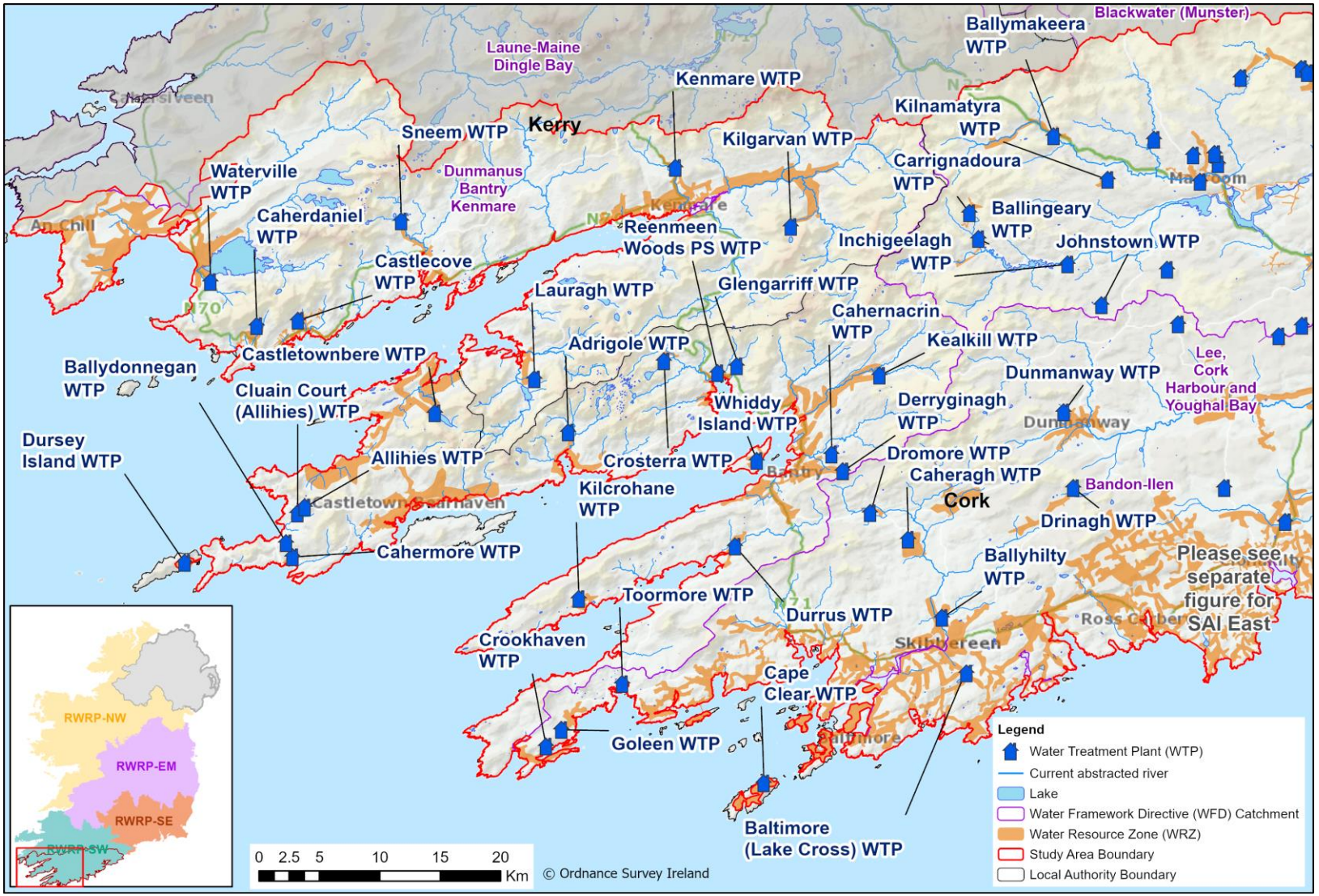

Figure 4.4a - Study Area l Cork/South Kerry Summary (West)

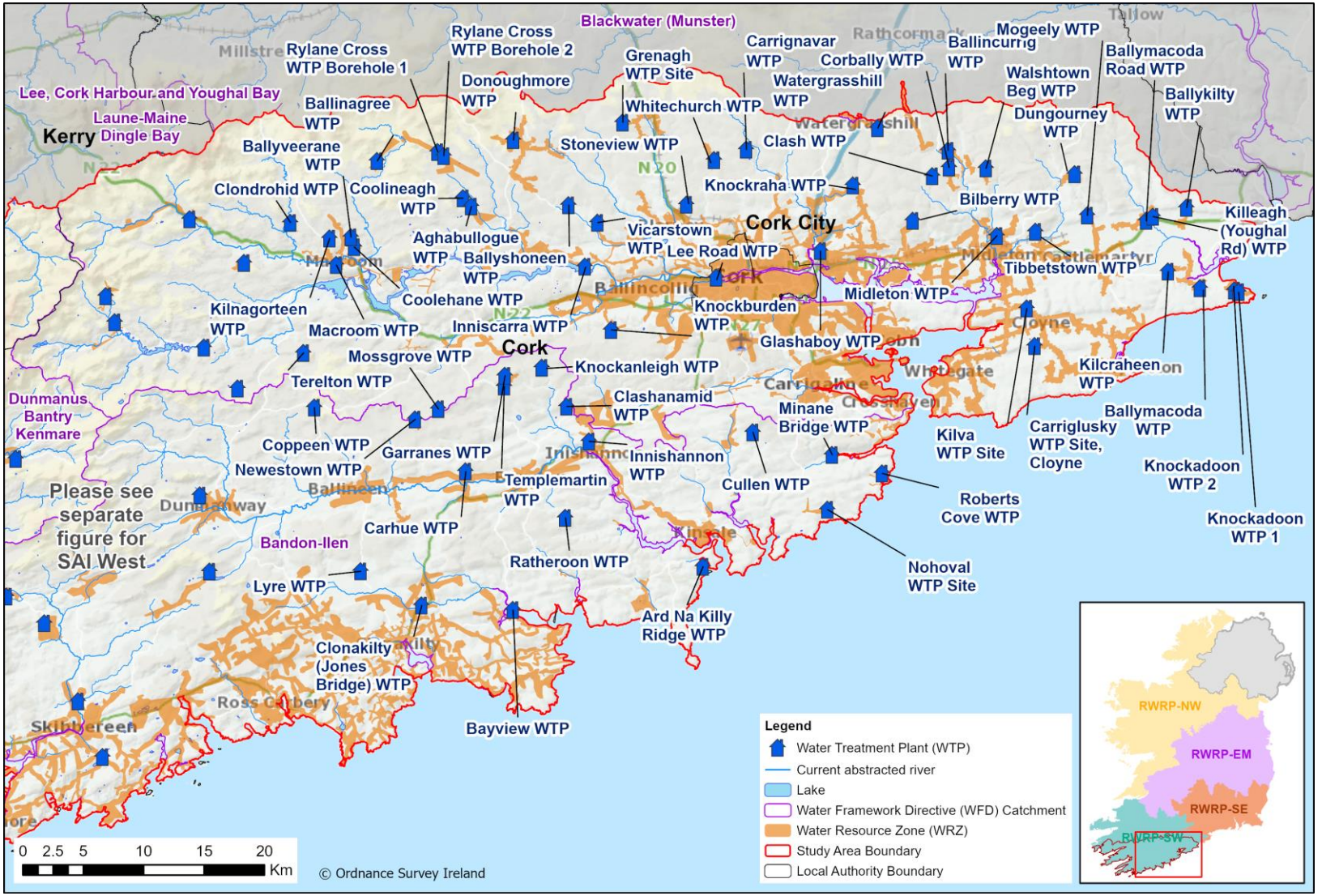

Figure 4.4b - Study Area I Cork/South Kerry Summary (East)

4.3.2 SAI Options Removed at Coarse Screening

The options detailed in Table 4.5 below were removed at Coarse Screening on environmental grounds.

Table 4.5 - SAI – Options removed at Coarse Screening on environmental grounds

Option Reference	Option Description	Rejection Reasoning
SAI-002	Increase SW abstraction from Bandon River and upgrade WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-003	New SW abstraction from Ballymahane River and upgrade existing Carhue WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-004	Interconnect Bandon Regional WRZ with Innishannon to supply deficit from Innishannon WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-006	New SW abstraction from Castlenalact Lake and upgrade Carhue WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-045	Increase GW abstraction Bayview BH and upgrade WTP.	No yield available to increase GW abstraction at Bayview BH. The option is therefore considered unviable.
SAI-049	Rationalise Bayview to Clonakilty WRZ.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-053	Rationalise Ard Na Killy Ridge to Cork City WRZ (Innishannon WTP).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-089	New GW abstraction to supply Roberts Cove deficit and upgrade WTP.	This option includes a new GW abstraction to supply deficit. There are issues around available yield and water quality.
SAI-110	Increase GW abstraction from Knockburden and upgrade Knockburden WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-115	New GW abstraction at Cullen and upgrade WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-152	Interconnect Tibbotstown and Midleton WRZs and supply deficit from Midleton.	This option is currently abstracting 5.402Ml/d at this location, which is above the UKTAG guidance. Therefore, increasing abstraction at this point is not feasible.
SAI-156	Develop raw water storage from large disused quarries in vicinity of Carrigtohill. New WTP on site.	This abstraction is currently over abstracting and there is no feasible way to fill up the quarry. Therefore, this option was not considered feasible at coarse screening stage.

Option Reference	Option Description	Rejection Reasoning
SAI-157	Increase SW abstraction from Glendine River.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-158	Increase SW abstraction from Glendine River.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-159	Increase SW abstraction from Glendine River.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-160	Increase SW abstraction from Glendine River.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-161	Increase SW abstraction from Glendine River.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-162	Increase SW abstraction from Glendine River.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-197	Increase SW abstraction from Owenacurra River and supply deficit.	This option is currently abstracting 5.402Ml/d at this location, which is above the UKTAG guidance. Therefore, it was not feasible to increase this abstraction.
SAI-243	New GW abstraction in the karstic region north of Ballymacoda WTP.	The yield associated with this option is limited. Other versions of the option that meet full deficit are considered.
SAI-244	New GW abstraction in the karstic region north of Ballymacoda WTP.	The yield associated with this option is limited. Other versions of the option that meet full deficit are considered.
SAI-246	Increase existing GW abstraction to supply Ballymacoda deficit.	The yield associated with this option is limited. Other versions of the option that meet full deficit are considered.
SAI-247	Increase existing GW abstraction to supply Ballymacoda deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-249	Rationalise Ballymacoda WRZ to Youghal WRZ (Glendire River source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-255	Interconnect Ballymacoda WRZ with Kilcredon GWS (GW source) and supply deficit.	This option includes interconnecting Ballymacoda WRZ with Kilcredon GWS to supply deficit. There are issues around available yield.
SAI-256	Interconnect Ballymacoda WRZ with Clonpriest/Ballymadog GWS (GW) and supply deficit.	This option includes interconnecting Ballymacoda WRZ with Kilcredon GWS to supply deficit. There are issues around available yield and water quality.
SAI-259	New GW abstraction to supply Corbally deficit.	This option recommends a new GW abstraction to supply deficit. There are issues around available yield.

Option Reference	Option Description	Rejection Reasoning
SAI-263	Increase GW abstraction and upgrade Ballykilty WTP.	This option recommends to increase the GW abstraction to supply deficit. There are issues around available yield.
SAI-267	Rationalise Ballykilty WRZ to Youghal WRZ (Glendire River source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-278	New GW abstraction in Clash Leamleara to supply deficit.	This option recommends a new GW abstraction in Clash Leamleara to supply deficit. There are issues around available yield and as a result was not taken forward to the fine screening stage.
SAI-284	New GW abstraction to supply Ballyshoneen deficit.	This option recommends a new GW abstraction to supply deficit. There are issues around available yield and as a result was not taken forward to the fine screening stage.
SAI-288	New GW abstraction to supply Ballincurrig/Lisgoold deficit.	This option proposes new GW abstraction to supply deficit. There are issues around available yield and the topography is unsuitable for a new well. This option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-292	Increase GW abstraction to supply Dungourney deficit.	This option proposes new GW abstraction to supply deficit. There are issues around available yield and the topography is unsuitable for a new well. This option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-295	Increase existing GW abstraction to supply Kilcraheen deficit.	The yield associated with this option is limited. Other versions of the option that meet full deficit are considered.
SAI-297	Interconnect Kilcraheen with Ballymacoda WRZ and supply deficit.	There are issues around available yield and as a result is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-298	Interconnect Kilcraheen with Ballymacoda WRZ and supply deficit.	There are issues around available yield and as a result is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-301	Rationalise Kilcraheen to Youghal WRZ (Glendire River source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-314	Increase existing GW abstraction and supply Knockadoon deficit.	There are issues around available yield and as a result would not be taken forward to the fine screening stage.
SAI-316	Interconnect Knockadoon WRZ with Ballymacoda WRZ.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.

Option Reference	Option Description	Rejection Reasoning
SAI-317	Interconnect Knockadoon WRZ with Ballymacoda WRZ.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. There were other viable options for these WRZs so this option was not considered feasible at coarse screening stage.
SAI-319	Rationalise Knockadoon WRZ to Youghal WRZ (Glendire River source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-327	Rationalise Inch WRZ to Youghal (Glendire River source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-329	Increase abstraction from Arideen River, Jones Bridge and supply deficit.	This option is currently abstracting 7.883Ml/d at this location, which is above the UKTAG Guidance. There were other viable options for these WRZs so this option was not considered feasible at coarse screening stage.
SAI-330	Increase abstraction from Arideen River, Jones Bridge and supply deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-331	New SW abstraction from Curraghlicky Lake and new WTP.	Option does not address full deficit. The sustainable allowable abstraction for this option is 1.714Ml/d, however 4.999Ml/d is required to address the supply demand problem. There were other viable options for these WRZs so this option was not considered feasible at coarse screening stage.
SAI-332	New SW abstraction from Curraghlicky Lake and new WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-333	New SW abstraction from Curraghlicky Lake and new WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-335	Increase abstraction from Bandon River (Bandon Regional WRZ) and supply deficit to Clonakilty.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-337	New SW abstraction from Batesmans Lough to partly supply deficit.	Option does not address full deficit. The sustainable allowable abstraction for this option is 0.193Ml/d, which is too low to partly address the deficit of 4.999Ml/d. Other versions of the option that meet full deficit are considered.
SAI-340	New SW abstraction from Lough Atarriff to partly supply deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.

Option Reference	Option Description	Rejection Reasoning
SAI-342	New SW abstraction from Ballin Lough and upgrade WTP to supply locally.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-346	Relocate intake on Argideen further downstream (Inchy Bridge, Burrane, Timoleague) and upgrade Clonakilty (Jones Bridge) WTP.	This abstraction is currently over abstracting from source. Therefore, this was not considered feasible at coarse screening stage.
SAI-354	Interconnect Skibbereen 1 - Ballyhilty and Drimoleague and Skibbereen (0500SC0021) and supply deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-360	Increase SW abstraction from Lough Abisdealy and Lakecross WTP.	The current abstraction is 1.249Ml/d which is already over the UKTAG Guidance for sustainable allowable abstraction. Local Authority comments also note that the water level in the lake has dropped in recent years and would not recommend increasing abstraction. Therefore, this option was not considered feasible at coarse screening stage.
SAI-361	Increase SW abstraction from Lough Abisdealy and Lakecross WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-362	Increase SW abstraction from Lough Abisdealy and upgrade Lakecross WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-365	Interconnect Skibbereen 2 - Baltimore and Schull and Skibbereen 1 - Ballyhilty and Drimoleague and supply deficit (River Ilen source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-368	New impoundment at Clanbanoo to supply deficit in Bantry.	As this is a WFD high status waterbody and the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving high WFD status and result in a greater risk of having adverse effects on this European site.
SAI-369	New impoundment at Clanbanoo to supply deficit in Bantry.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-370	New impoundment at Clanbanoo to supply deficit in Bantry to feed deficit full demand taken from Drombow Lake and rationalise Drombow Lake source.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.

Option Reference	Option Description	Rejection Reasoning
SAI-371	New impoundment at Clanbanoo to supply deficit in Bantry to feed deficit full demand taken from Drombow Lake and rationalise Drombow Lake source.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-372	New SW abstraction from Reenydonagan Lough and upgrade WTP.	This option recommends a new SW abstraction from Reenydonagan Lough. The option voume is 0.937Ml/d which is above the allowable abstraction limit of 0.296Ml/d. Reenydongan lake is also a transitional waterbody and any abstraction would require significant treatment. Option does not address full deficit.
SAI-377	Increase existing SW abstraction from Inchilough and supply deficit. Upgrade existing Cahernancin WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-378	Increase existing SW abstraction from Drombrow Lake and supply deficit. Upgrade existing Cahernancin WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-379	Increase impoundment at Lough Bofinna.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-380	Abandon Kealkill WTP and feed from Bantry Derryginagh.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-381	Increase SW abstraction from Glenbeg and upgrade Castletownbere WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-382	Increase SW abstraction from Glenbeg and upgrade Castletownbere WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-383	New SW abstraction from Lough Fadda and upgrade WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-384	New SW abstraction from Drimminboy River and upgrade WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-386	Supply deficit to Castletownbere from new impoundment at Bantry.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-392	Increase SW abstraction Coolkellure Lake and upgrade WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.

Option Reference	Option Description	Rejection Reasoning
SAI-396	New SW abstraction from Mohona Lough.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-397	New SW abstraction from Dunmanway Lake.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-402	Increase existing SW abstraction from Barony River and supply deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-403	Increase existing SW abstraction from Barony River and supply deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-406	New SW abstraction from Loughavaul Lake and new WTP onsite.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-409	Increase SW abstraction from Owengar River and upgrade Kealkill WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-413	New SW abstraction from Cappnaboul Lough and new WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-414	New SW abstraction from Atooreen Lough and new WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-415	Abandon Kealkill WTP and feed from Bantry Derryginagh.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-418	Interconnect Kealkill and Bantry WRZs and supply deficit from new Bantry impoundment.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-419	Interconnect Kealkill and Bantry WRZs and supply deficit from new Bantry impoundment.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-420	Increase SW abstraction from Clashduff River and upgrade Adrigole WTP to supply deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-428	Increase GW abstraction to supply Dursey Island deficit and upgrade WTP.	There is a great uncertainty around available yield and as a result is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-431	Increase GW abstraction to supply Dursey Island deficit and upgrade WTP.	The yield associated with this option is limited and would not meet deficit. There were other viable options for the WRZ, so this option was not considered feasible at coarse screening stage.

Option Reference	Option Description	Rejection Reasoning
SAI-435	Rationalise Drinagh to Clonakilty (new SW abstraction from Curraghlicky Lake).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-438	Increase existing SW abstraction from Four Mile Water River and upgrade Durrus WTP to supply deficit.	This recommends increasing the abstraction at Four Mile Water River to partly supply deficit. There are issues around available yield and water quality. A full water treatment plant would be required. As a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-445	Increase SW abstraction from Kilmore Lake and update WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-451	Increase GW abstraction from BH and upgrade Kilchrone WTP.	The yield associated with this option is limited and would not meet deficit. Therefore, this was not considered feasible at coarse screening stage.
SAI-456	Rationalise Dromore Bantry to Skibbereen WRZ for increased resilience (River Ilen source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-458	Interconnect Goleen with Crookhaven to feed deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-463	Rationalise Goleen to Skibbereen WRZ for increased resilience (River Ilen source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-469	Increase SW abstraction and upgrade Allihies WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-470	Increase SW abstraction and upgrade Allihies WTP.	This option recommends an increasing existing SW abstraction. The existing abstraction already over the 10% limit. Therefore, the option is not taken forward to fine screening as no further abstraction is possible from the small Lough.
SAI-472	Increase GW abstraction at Cluain Court WTP and supply deficit.	There is insufficient yield to supply deficit. Other options that meet full deficit are considered.
SAI-473	Increase GW abstraction at Cluain Court WTP and supplement to Allihies.	There is insufficient yield to supply deficit. Other options that meet full deficit are considered.
SAI-476	New GW abstraction to supply deficit.	This option recommends a new GW abstraction to supply deficit. There are issues associated with yield and instability. As a result, this option was not taken forward to the fine screening stage.

Option Reference	Option Description	Rejection Reasoning
SAI-477	Increase existing SW abstraction from Cahermore River and supply deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-484	Rationalise Caheragh WTP to Drimoleague WTP.	There are already two existing abstractions on the River Ilen for Drimoleague WTP which are abstracting 0.164Ml/d in total. The total option volume of 2.561Ml/d which is above the allowable abstractions of 0.097Ml/d and 0.141Ml/d.
SAI-485	Rationalise Caheragh to Skibbereen WRZ for increased resilience (River Ilen source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-487	New GW abstraction in Coppeen and upgrade Coppeen WTP.	There are issues around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-490	New GW abstraction at Reenmeen West and upgrade Reenmeen Woods WTP.	This option recommends a new GW abstraction at Reenmeen West. There are issues around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-496	Rationalise Reenmeen to Glengarriff WRZ (Barony River source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-497	Increase GW abstraction and upgrade Toormore WTP to supply deficit.	There are issues around available yield and as a result, this option was not taken forward to the fine screening stage.
SAI-500	New SW abstraction from Toormore Lake and upgrade Toormore WTP.	This option recommends a new SW abstraction from Toormore Lake but the location of the lake is unknown. As a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-501	Rationalise Toormore to Skibbereen WRZ for increased resilience (River Ilen source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-503	Increase SW abstraction and increase height of Crookhaven Impoundment (Arduslough).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-506	Rationalise Crookhaven to Skibbereen WRZ for increased resilience (River Ilen source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-514	Connect Cape Clear to mainland to Skibbereen WRZ (River Ilen source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.

Option Reference	Option Description	Rejection Reasoning
SAI-520	Interconnect Lyre Clonakilty and Clonakilty WRZs and supply deficit (new SW abstraction from Curraghlicky Lake).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-521	Rationalise Lyre Clonakilty to Clonakilty (new SW abstraction from Curraghlicky Lake).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-524	Rationalise Cluain Court Allihies to Allihies WRZ for increased resilience (Allihies impoundment).	There is insufficient yield to supply deficit. Other options that meet full deficit are considered.
SAI-525	Rationalise Cluain Court Allihies to Allihies WRZ for increased resilience (GW).	There is insufficient yield to supply deficit. Other options that meet full deficit are considered.
SAI-567	New SW abstraction from the Blackwater River and new WTP - Connection to City.	This option proposes a new SW abstraction from the Blackwater River. Abstraction would lead to a direct pathway to River Blackwater SAC. It is a freshwater pearl mussel catchment therefore the allowable abstraction is 5% of Q95. This option only addresses 50% of the deficit. As there were other viable options that meet the full deficit, this option was not considered feasible at coarse screening stage.
SAI-568	Increase SW abstraction from Bandon River and upgrade Innishannon WTP.	5Ml/d is already being abstracted from the source, the additional 6.596Ml/d can fulfil up to 9% of the total deficit. As there were other viable options that meet full the deficit, this option was not considered feasible at coarse screening stage.
SAI-569	Increase SW abstraction from Bandon River and upgrade Innishannon WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-570	Increase SW abstraction from Bandon River and upgrade Innishannon WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-574	New SW abstraction from Owenaboy River and new WTP.	This option recommends a new SW abstraction from Bride River. This abstraction only addresses 3.7% of the total deficit.
SAI-575	New SW abstraction from Bride River and new WTP.	This option recommends a new SW abstraction from Bride River. Already abstracted for Conna RWSS, located downstream of Rothcormac. The total abstraction including the already abstracted volume fulfils only 5% of the total deficit.

Option Reference	Option Description	Rejection Reasoning
SAI-582	Interconnect City with Conna Regional to feed local deficit at Glashaboy (Surplus of ~0.5MLD in Conna).	With the total allowable abstraction taken as additional flow, this option can fulfil only <7% of the total deficit of Cork city. Other versions of the option that meet full deficit are considered.
SAI-583	Increase SW abstraction from Butlerstown River and upgrade WTP.	This option address only approximately 0.35% of the total deficit. Other versions of the option that meet full deficit are considered.
SAI-584	Increase GW abstraction in Meenane Spring and upgrade Watergrasshill Tower WTP to partly supply deficit.	This option has issues with the current supply. The supply is currently switched off. Therefore, the option is not taken forward to the fine screening stage.
SAI-585	Increase SW abstraction at Knockraha WTP.	This Option address only <0.5% of the total deficit. Other versions of the option that meet full deficit are considered.
SAI-586	Increase SW abstraction at Knockraha WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-587	Rationalise Watergrasshill WTP to Knockraha WTP (maintain spring source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-588	Recommission impoundment in Ballyshoneen to feed Ballincollig.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-589	New GW abstraction in Meenane Spring and upgrade Watergrasshill Tower WTP to partly supply deficit.	The local geography is unsuitable for planned works and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-590	New SW abstraction from Barnetstown River and upgrade Watergrasshill Tower WTP.	This option includes a new SW abstraction from Barnetstown River. There are issues around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-591	Interconnect with Conna Regional to feed deficit at Watergrasshill (Surplus of ~0.5MLD in Conna).	This option does not address deficit. 70.527Ml/d is required to address the deficit, however only 4.958Ml/d is available. Other versions of the option that meet full deficit are considered.
SAI-592	Increase GW abstraction in Belgooly and upgrade Belgooly WTP.	There are issues around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-593	New GW abstraction in Belgooly and upgrade Belgooly WTP to partly supply deficit.	There are issues around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAI-594	New SW abstraction from the River Stick and upgrade Belgooly WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.

Option Reference	Option Description	Rejection Reasoning
SAI-601	Rationalise Lauragh to Castletownbere WRZ.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-629	Increase SW abstraction at Eirk Lough and upgrade Kenmare WTP.	This abstraction is currently abstracting above sustainable limit. Therefore, this option was not considered feasible at coarse screening stage.
SAI-631	Increase abstraction at Kilgarvan from lake.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-636	Increase SW abstraction from Coonmahorna West River and upgrade Caherdaniel WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-637	Increase SW abstraction from Coonmahorna East River and upgrade Caherdaniel WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-638	Increase SW abstraction from Gowlane Intake and upgrade Castlecove WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-639	Increase SW abstraction from Behaghane Intake and upgrade Castlecove WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-640	Increase GW abstraction from Castlecove WTP BH1 (poorly productive aquifer) and upgrade Castlecove WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-644	Increase SW abstraction at Coomclogherane Lake and upgrade Kilgarvan WTP.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-646	Recommission abandoned stream source in Kilgarvan.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-651	New surface water abstraction from the Ahadav stream plus increase abstraction from the BH.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-654	Interconnect to GWS nearby (Tuosist).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-666	Interconnect Skibbereen 1 - Ballyhilty and Drimoleague and Dunmanway WRZs and supply deficit (Garranes Lakes source).	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-676	New impoundment at Derryfadda to supply deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.

Option Reference	Option Description	Rejection Reasoning
SAI-677	New impoundment at Derryfadda - Kealkill and interconnect with Bantry to supply deficit.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.
SAI-684	New impoundment at Clanbanoo to supply deficit in Bantry to feed deficit full demand taken from Drombow Lake and rationalise Drombow Lake source.	Option does not address full deficit. Other versions of the option that meet full deficit are considered.

4.3.3 Preferred Approach for SAI

Full details of the Preferred Approach (and how it was reached) are included in the SAI Technical Report in Appendix 2 of the RWRP-SW. The findings of the Preferred Approach Development for SAI Cork/South Kerry include the following:

- 23 options score 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; Group option SAI-949.
- The remaining options within the Preferred Approach have either a -1 or a -2 score against European sites.

In summary, the Preferred Approach for SAI is the Combination 6 approach which consists of local WRZ supplies for 36 of the 89 WRZs in the Study Area, primarily driven by the small scale of the supplies and difficulties in transporting small volumes of water over long distances.

The Preferred Approach will result in a reduction of WRZs from 89 to 48. 42 of the existing 110 abstractions in SAI are proposed to be decommissioned, providing significant environmental and operational benefit, particularly as six of these are abstractions which may not meet future sustainability standards during dry weather flows, at Tibbotstown, Castletownbere, Glengarrif, Allihies, Cahermore and Caherdaniel/ Castlecove WRZs.

The Preferred Approach for SAI Cork/South Kerry 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 Geashill PWS, Edenderry/Rhode, Walsh Island PWS, Mullingar Regional and Ballany Water Resource Zones, amounting to 2,294m³ per day (applied to SDB Deficit) to move towards achieving the National SELL Target by 2034.
- Continuation of Irish Water 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 a number of WTPs (for example Bayview WTP, Reenmeen West WTP, Castletownbere WTP and Allihies WTP) which currently extract from

European sites including Courtmacsherry Bay SAC and SPA, Glengarriff Harbour and Woodland SAC, Glanmore Bog SAC and Kenmare River SAC.

All of the options that make up the Preferred Approach and assessed as part of the NIS are shown in Table 4.6 and shown in Figures 4.5a and 4.5b below.

Table 4.6 - Final Preferred Approach for SAI – Options

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-957 **(Part of Grouped Option SAI-971)** 0500SC0145 Bandon Regional	-2	**Interconnect with Cork City via Inniscarra** • Bandon WRZ in deficit and is to be interconnected with Inniscarra • WRZ current WAFU DYCP 2044 = 4.51Ml/d, DYCP 2044 demand = 6.397Ml/d so additional 1.887Ml/d required to meet WRZ deficit • Existing SW abstraction maintained • Existing source (Inniscarra LWB) WFD status 2016-2021 – Good
SAI-011 0500SC0070 Ballymakeera	-1	**New SW abstraction from River Sullane and upgrade Ballymakeera WTP** • Ballymakeera WRZ in deficit • New SW abstraction to meet WRZ future deficit • Ballymakeera WRZ current WAFU DYCP 2044 = 0.33Ml/d, DYCP 2044 demand = 0.494Ml/d so additional 0.164Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good • New source (Sullane RWB) WFD status 2016-2021 – High
SAI-855 **(Part of Grouped Option SAI-952)** 0500SC0071 Clondrohid	0	**Rationalise Clondrohid to Macroom WRZ** • Clondrohid WRZ in deficit and is to be rationalised to Macroom WRZ • Clondrohid WRZ current WAFU DYCP 2044 = 0.05Ml/d, DYCP 2044 demand = 0.116Ml/d so additional 0.066Ml/d required to meet WRZ deficit • Existing GW abstraction is to be decommissioned • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good
SAI-851 **(Part of Grouped Option SAI-952)** 0500SC0177 Macroom	0	**Increase SW abstraction from Sullane River and new WTP Macroom WTP for full demand** • Macroom WRZ in projected surplus • Increase existing SW abstraction and new WTP to supply WRZ future deficit • Macroom WRZ current WAFU DYCP 2044 = 2.017Ml/d, DYCP 2044 demand = 2.005Ml/d so surplus of 0.011Ml/d • Existing SW abstraction maintained • Existing source (Sullane RWB) WFD status 2016-2021 – Good
SAI-852	0	**Rationalise Kilnagurteen (Macroom) to Macroom WRZ**

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
(Part of Grouped Option SAI-952) 0500SC0179 Kilnagurteen (Macroom)		• Kilnagurteen (Macroom) WRZ in projected surplus but is to be rationalised to Macroom WRZ • Kilnagurteen (Macroom) WRZ current WAFU DYCP 2044 = 0.011Ml/d, DYCP 2044 demand = 0.01Ml/d so surplus of 0.001Ml/d • Existing GW abstraction is to be decommissioned • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good
SAI-853 **(Part of Grouped Option SAI-952)** 0500SC0180 Ballyverane	0	**Rationalise Ballyverane to Macroom WRZ** • Ballyverane WRZ in deficit and is to be rationalised to Macroom WRZ • Ballyverane WRZ current WAFU DYCP 2044 = 0.05Ml/d, DYCP 2044 demand = 0.116Ml/d so additional 0.066Ml/d required to meet WRZ deficit • Existing GW abstraction is to be decommissioned • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good
SAI-942 **(Part of Grouped Option SAI-971)** 0500SC0059 Aghabulloge	-2	**Rationalise to Cork City WRZ** • Aghabulloge WRZ in deficit and is to be rationalised to Cork City WRZ • Aghabulloge WRZ current WAFU DYCP 2044 = 0.033Ml/d, DYCP 2044 demand = 0.101Ml/d so additional 0.068Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-854 **(Part of Grouped Option SAI-952)** 0500SC0178 Coolyhane	0	**Rationalise Coolyhane to Macroom WRZ** • Coolyhane WRZ in deficit and is to be rationalised to Macroom WRZ • Coolyhane WRZ current WAFU DYCP 2044 = 0.024Ml/d, DYCP 2044 demand = 0.081Ml/d so additional 0.057Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good
SAI-954 **(Part of Grouped Option SAI-971)** 0500SC0073 Ballinagree	-2	**Rationalise to Cork City WRZ** • Ballinagree WRZ in deficit and is to be rationalised to Cork City WRZ • Ballinagree WRZ current WAFU DYCP 2044 = 0.039Ml/d, DYCP 2044 demand = 0.054Ml/d so additional 0.015Ml/d required to meet WRZ deficit • Existing GW abstraction decommissioned • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-955 **(Part of Grouped Option SAI-971)** 0500SC0074 Rylane	-2	**Rationalise to Cork City WRZ** • Rylane WRZ in projected surplus but is to be rationalised to Cork City WRZ • Rylane WRZ current WAFU DYCP 2044 = 0.308Ml/d, DYCP 2044 demand = 0.235Ml/d so surplus of 0.073Ml/d • Existing GW abstraction decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-960 **(Part of Grouped Option SAI-971)** 0500SC0146 Clashanamid	-2	**Rationalise Clashanamid to Cork City WRZ (Innishannon WTP)** • Clashanamid WRZ in deficit and is to be rationalised to Cork City WRZ • Clashanamid WRZ current WAFU DYCP 2044 = 0.011Ml/d, DYCP 2044 demand = 0.013Ml/d so additional 0.002Ml/d required to meet WRZ deficit • Existing GW abstraction decommissioned • Existing source (Bandon GWB) WFD status 2016-2021 – Good
SAI-940 **(Part of Grouped Option SAI-971)** 0500SC0171 Knockburden	-2	**Rationalise Knockburden to Cork City WRZ (Inniscarra WTP) via Cloughduv** • Knockburden WRZ not in projected surplus and is to be rationalised to Cork City WRZ • Knockburden WRZ current WAFU DYCP 2044 = 4.51Ml/d, DYCP 2044 demand = 6.397Ml/d so surplus of 0Ml/d • Existing GW abstraction decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-951 **(Part of Grouped Option SAI-971)** 0500SC0020 Cullen	-2	**Rationalise Cullen to Cork City WRZ (Inniscarra WTP)** • Cullen WRZ in deficit and is to be rationalised to Cork City WRZ • Cullen WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.01Ml/d so an additional 0.001Ml/d required to meet WRZ future deficit • Existing GW abstraction decommissioned • Existing source (Bandon GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-943 **(Part of Grouped Option SAI-971)** 0500SC0058 Coolineagh	-2	**Rationalise to Cork City WRZ** • Coolineagh WRZ in deficit and is to be rationalised to Cork City WRZ • Coolineagh WRZ current WAFU DYCP 2044 = 0.005Ml/d, DYCP 2044 demand = 0.005Ml/d so an additional 0.001Ml/d required to meet WRZ future deficit • Existing GW abstraction decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-959 **(Part of Grouped Option SAI-971)** 0500SC0161 Tibbotstown	-2	**RationaliseTibbotstown to Cork City WRZ (Inniscarra WTP)** • Tibbotstown WRZ in deficit and is to be rationalised to Cork City WRZ • Tibbotstown WRZ current WAFU DYCP 2044 = 1.78Ml/d, DYCP 2044 demand = 5.15Ml/d so additional 3.37Ml/d required to meet WRZ deficit • Existing SW abstractions to be decommissioned • Existing sources (Tibbotstown Reservoir) WFD status 2016-2021 – Unassigned and (Owennacurra RWB) WFD status 2016-2021 – Good
SAI-949 **(Part of Grouped Option SAI-971)** 0500SC0055 Grenagh	-2	**Rationalise Grenagh WRZ and Cork City WRZ (Inniscarra WTP) via Blarney** • Grenagh WRZ in deficit and is to be rationalised to Cork City WRZ • Grenagh WRZ current WAFU DYCP 2044 = 0.114Ml/d, DYCP 2044 demand = 0.442Ml/d so additional 0.329Ml/d required to meet WRZ future deficit • Existing GW abstractions to be decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-944 **(Part of Grouped Option SAI-971)** 0500SC0047 Corbally	-2	**Rationalise Corbally to Inniscarra WTP** • Corbally WRZ in deficit and is to be rationalised to Cork City WRZ • Corbally WRZ current WAFU DYCP 2044 = 0.037Ml/d, DYCP 2044 demand = 0.09Ml/d so additional 0.053Ml/d required to meet WRZ deficit • Existing GW abstraction is to be decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-945 **(Part of Grouped Option SAI-971)** 0500SC0048 Clash Leamleara	-2	**Rationalise Clash Leamleara to Inniscarra WTP via Corbally** • Clash Leamleara WRZ in deficit and is to be rationalised to Cork City WRZ • Clash Leamleara WRZ current WAFU DYCP 2044 = 0.02Ml/d, DYCP 2044 demand = 0.033Ml/d so additional 0.013Ml/d required to meet WRZ future deficit • Existing GW abstraction to be decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-952 **(Part of Grouped Option SAI-971)** 0500SC0172 Ballyshoneen	-2	**Rationalise Ballyshoneen and Vicarstown to Inniscarra WTP** • Ballyshoneen WRZ in deficit and is to be rationalised to Cork City WRZ • Ballyshoneen WRZ current WAFU DYCP 2044 = 0.011Ml/d, DYCP 2044 demand = 0.039Ml/d so additional 0.028Ml/d required to meet WRZ future deficit • Existing GW abstraction to be decommissioned • Existing source (Ballihassig East GWB) WFD status 2016-2021 – Good
SAI-946 **(Part of Grouped Option SAI-971)** 0500SC0167 Ballincurrig Lisgoold	-2	**Rationalise Ballincurrig Lisgoold WRZ to Inniscarra WTP** • Ballincurig Lisgoold WRZ in deficit and is to be rationalised to Cork City WRZ • Ballincurig Lisgoold WRZ current WAFU DYCP 2044 = 0.088Ml/d, DYCP 2044 demand = 0.094Ml/d so additional 0.006Ml/d required to meet WRZ future deficit • Existing GW abstraction to be decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-947 **(Part of Grouped Option SAI-971)** 0500SC0046 Walshtown	-2	**Rationalise Walshtown to Inniscarra WTP** • Walshtown WRZ in deficit and is to be rationalised to Cork City WRZ • Walshtown WRZ current WAFU DYCP 2044 = 0.014Ml/d, DYCP 2044 demand = 0.022Ml/d so additional 0.009Ml/d required to meet WRZ future deficit • Existing GW abstraction to be decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-950 **(Part of Grouped Option SAI-971)** 0500SC0053 Stoneview Blarney	-2	**Rationalise Stoneview to Cork City WRZ (Inniscarra WTP)** • Stoneview Blarney WRZ in deficit and is to be rationalised to Cork City WRZ • Stoneview Blarney WRZ current WAFU DYCP 2044 = 0.04Ml/d, DYCP 2044 demand = 0.046Ml/d so additional 0.006Ml/d required to meet WRZ deficit • Existing GW abstraction is to be decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-939 **(Part of Grouped Option SAI-971)** 0500SC0082 Cork City	-2	**Increase abstraction at Inniscarra** • Cork City WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 131.884Ml/d, DYCP 2044 demand = 186.88Ml/d so additional 54.996Ml/d required to meet WRZ deficit • Existing SW abstractions maintained. Existing sources: (Inniscarra LWB) WFD status 2016-2021 – Good, (Lee [Cork] RWB) WFD status 2016-2021 – Good, (Bandon RWB) WFD status 2016-2021 – Good, (Butlerstown RWB) WFD status 2016-2021 – Good, (Glashaboy [Lough Mahon]) WFD status 2016-2021 – Good and (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-958 **(Part of Grouped Option SAI-971)** 0500SC0153 Clonakilty	-2	**Interconnect with Cork City via Inniscarra** • Clonakilty WRZ in deficit and is to be interconnected with Inniscarra • Clonakilty WRZ current WAFU DYCP 2044 = 6.250Ml/d, DYCP 2044 demand = 11.249Ml/d so additional 4.999Ml/d required to meet WRZ deficit • Existing SW abstraction maintained. Existing sources (Argideen RWB) WFD status 2016-2021 – Moderate and (Leap Stream RWB) WFD status 2016-2021 – Good
SAI-953 **(Part of Grouped Option SAI-971)** 0500SC0054 Vicarstown	-2	**Rationalise Ballyshoneen and Vicarstown to Inniscarra WTP** • Vicarstown WRZ is in projected surplus but is to be rationalised to Cork City WRZ • WRZ current WAFU DYCP 2044 = 0.028Ml/d, DYCP 2044 demand = 0.008Ml/d so surplus of 0.021Ml/d • Existing GW abstraction decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Moderate

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-941 **(Part of Grouped Option SAI-971)** 0500SC0081 Templemartin & Garranes	-2	**Rationalise Templemartin & Garranes to Cork City WRZ (Inniscarra WTP)** • Templemartin & Garranes WRZ in projected surplus but is to be rationalised to Cork City WRZ • Templemartin & Garranes WRZ current WAFU DYCP 2044 = 0.041Ml/d, DYCP 2044 demand = 0.035Ml/d so surplus of 0.006Ml/d • Existing GW abstraction to be decommissioned. • Existing source (Bandon GWB) WFD status 2016-2021 – Good
SAI-956 **(Part of Grouped Option SAI-971)** 0500SC0152 Bayview	-2	**Rationalise to Cork City** • Bayview WRZ in deficit and is to be rationalised to Cork City WRZ • Bayview WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.065Ml/d so additional 0.056Ml/d required to meet WRZ deficit • Existing GW abstraction is to be decommissioned • Existing source (Skibbereen-Clonakilty GWB) WFD status 2016-2021 – Good
SAI-948 **(Part of Grouped Option SAI-971)** 0500SC0159 Midleton	-2	**Maintain allowable abstraction from Owennacurra River and supply deficit from Inniscarra** • Midleton WRZ in projected surplus and is to be interconnected with Inniscarra • Midleton WRZ current WAFU DYCP 2044 = 5.042Ml/d, DYCP 2044 demand = 4.796Ml/d so surplus of 0.246Ml/d • Existing SW abstraction maintained. Existing source (Owennacurra RWB) WFD status 2016-2021 – Moderate
SAI-050 0500SC0019 Ard Na Killy Ridge	0	**Increase GW abstraction and upgrade Ard na Killy WTP** • Ard na Killy WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Ard na Killy WRZ current WAFU DYCP 2044 = 0.017Ml/d, DYCP 2044 demand = 0.059Ml/d so additional 0.043Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Bandon GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-060 0500SC0009 Ballingeary	-1	**Increase SW from Bunsheelin River and upgrade WTP** • Ballingeary WRZ in deficit • Increase existing SW abstraction to meet WRZ future deficit • Ballingeary WRZ current WAFU DYCP 2044 = 0.105Ml/d, DYCP 2044 demand = 0.106Ml/d so additional 0.002Ml/d required to meet WRZ deficit • Existing SW maintained • Existing source (Lee [Cork] RWB) WFD status 2016-2021 – Good
SAI-102 0500SC0010 Carrignadoura	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Carrignadoura WRZ in projected surplus so WTP upgrade works only • Carrignadoura WRZ current WAFU DYCP 2044 = 0.11Ml/d, DYCP 2044 demand = 0.081Ml/d so surplus of 0.029Ml/d • Existing GW maintained • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good
SAI-146 0500SC0095 Knockanleigh	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Knockanleigh WRZ in projected surplus so WTP upgrade works only • Knockanleigh WRZ current WAFU DYCP 2044 = 0.007Ml/d, DYCP 2044 demand = 0.004Ml/d so surplus of 0.003Ml/d • Existing GW maintained • Existing source (Bandon GWB) WFD status 2016-2021 – Good
SAI-176 0500SC0184 Whitegate Regional	0	**Increase GW abstraction from Dower Springs and supply deficit. New WTP** • Whitegate Regional WRZ in deficit so increase existing GW abstraction and build new WTP to meet WRZ future deficit • Whitegate Regional WRZ current WAFU DYCP 2044 = 6.417Ml/d, DYCP 2044 demand = 8.858Ml/d so an additional 2.441Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Bandon GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-193 0500SC0158 Cloyne	-1	**New GW abstraction (karstic region) and new WTP to supply deficit** • Cloyne WRZ in deficit so new GW abstraction and new WTP to meet WRZ future deficit • Cloyne WRZ current WAFU DYCP 2044 = 2.475Ml/d, DYCP 2044 demand = 3.274Ml/d so an additional 0.799Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (White GWB) WFD status 2016-2021 – Good • New source (Cloyne GWB) WFD status 2016-2021 – Good
SAI-212 0500SC0057 Donoughmore	0	**New GW abstraction and upgrade WTP to supply deficit** • Donoughmore WRZ in deficit so increase existing GW abstraction and new WTP to meet WRZ future deficit • Donoughmore WRZ current WAFU DYCP 2044 = 0.387Ml/d, DYCP 2044 demand = 5.814Ml/d so an additional 0.194Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-239 0500SC0051 Whitechurch	0	**Increase GW abstraction to partly supply deficit** • Dependent on Option 240 • Whitechurch WRZ in deficit so increase existing GW abstraction to partially meet WRZ future deficit • Whitechruch WRZ current WAFU DYCP 2044 = 0.119Ml/d, DYCP 2044 demand = 0.85Ml/d so an additional 0.731Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-240 0500SC0051 Whitechurch	0	**New GW abstraction in Whitechurch to partly supply deficit** • Dependent on Option 239 • Whitechurch WRZ in deficit so new GW abstraction to partially meet WRZ future deficit • Whitechruch WRZ current WAFU DYCP 2044 = 0.119Ml/d, DYCP 2044 demand = 0.85Ml/d so an additional 0.731Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good • New source (Ballinhassig East GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-273 0500SC0050 Carrignavar	0	**Increase existing GW abstraction and supply deficit** • Carrignavar WRZ in deficit so increase existing GW abstraction to meet WRZ future deficit • Carrignavar WRZ current WAFU DYCP 2044 = 0.171Ml/d, DYCP 2044 demand = 0.174Ml/d so an additional 0.004Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-324 0500SC0043 Inch	0	**Increase existing GW abstraction from spring and supply deficit** • Inch WRZ in deficit so increase existing GW abstraction to meet WRZ future deficit. • Inch WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.023Ml/d so an additional 0.013Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Glenville GWB) WFD status 2016-2021 – Good
SAI-410 0500SC0183 Kealkill	0	**New SW abstraction from Coomhola River and new WTP** • Kealkill WRZ in deficit so new SW abstraction to meet WRZ future deficit • Kealkill WRZ current WAFU DYCP 2044 = 0.245Ml/d, DYCP 2044 demand = 0.47Ml/d so an additional 0.226Ml/d required to meet WRZ deficit • Existing source (Owngar [Cork] RWB) WFD status 2016-2021 – High • New source (Coomhola_020) WFD status 2016-2021 – 'High'
SAI-442 0500SC0027 Durrus	0	**Increase GW abstraction to supply deficit and upgrade WTP** • Durrus WRZ in deficit so increase GW abstraction to meet WRZ future deficit • Durrus WRZ current WAFU DYCP 2044 = 0.139Ml/d, DYCP 2044 demand = 0.18Ml/d so an additional 0.040Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Beara Sneem GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-450 0500SC0031 Whiddy Island	0	**New GW abstraction on the island to supply deficit** • Whiddy Island WRZ in deficit so new GW abstraction to meet WRZ future deficit • Whiddy Island WRZ current WAFU DYCP 2044 = 0.007Ml/d, DYCP 2044 demand = 0.049Ml/d so an additional 0.041Ml/d required to meet WRZ deficit • Existing SW maintained • Existing source (Kilmore LWB) WFD status 2016-2021 – Unassigned • New source (Beara Sneem Islands GWB) WFD status 2016-2021 – Good
SAI-455 0500SC0029 Dromore Bantry	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Dromore Bantry WRZ in projected surplus WTP upgrade works only • Dromore Bantry WRZ current WAFU DYCP 2044 = 0.007Ml/d, DYCP 2044 demand = 0.049Ml/d so surplus of 0.041Ml/d • Existing GW maintained • Existing source (Skibbereen-Clonakilty GWB) WFD status 2016-2021 – Good
SAI-457 0500SC0024 Goleen	-2	**Increase SW abstraction from Goleen Intake and upgrade Goleen WTP** • Goleen WRZ in deficit so increase existing SW abstraction to meet WRZ future deficit • Goleen WRZ current WAFU DYCP 2044 = 0.09Ml/d, DYCP 2044 demand = 0.094Ml/d so an additional 0.004Ml/d required to meet WRZ deficit • Existing SW maintained • Existing source (Castlemehigan LWB) WFD status 2016-2021 – Unassigned
SAI-468 0500SC0069 Crosterra	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Crosterra WRZ in projected surplus WTP upgrade works only • Crosterra WRZ current WAFU DYCP 2044 = 0.066Ml/d, DYCP 2044 demand = 0.031Ml/d so surplus of 0.035Ml/d • Existing SW maintained • Existing source (Glengarriff RWB) WFD status 2016-2021 – High

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-480 0500SC0036 Cahermore	-2	**New GW abstraction to supply deficit and upgrade WTP. Abandon existing SW source** • Cahermore WRZ in deficit so new GW abstraction to meet WRZ future full demand • Cahermore WRZ current WAFU DYCP 2044 = 0.008Ml/d, DYCP 2044 demand = 0.021Ml/d so an additional 0.013Ml/d required to meet WRZ full demand • Existing GW / SW to be decommissioned • Existing source [if GW] (Beara Sneem GWB) WFD status 2016-2021 – Good • Existing source [if SW] (Hill Loughanemore RWB) WFD status 2016-2021 – Good • New source (Beara Sneem GWB) WFD status 2016-2021 – Good
SAI-486 0500SC0168 Coppeen	0	**Increase GW abstraction at Coppeen Source to supply deficit and upgrade Coppeen WTP** • Coppeen WRZ in deficit so increase existing GW abstraction to meet WRZ future deficit • Cahermore WRZ current WAFU DYCP 2044 = 0.008Ml/d, DYCP 2044 demand = 0.018Ml/d so an additional 0.010Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Beara Sneem GWB) WFD status 2016-2021 – Good
SAI-498 0500SC0023 Toormore	-1	**New GW abstraction and upgrade Toormore WTP to supply deficit** • Toormore WRZ in projected surplus so WTP upgrade works only • Toormore WRZ current WAFU DYCP 2044 = 0.018Ml/d, DYCP 2044 demand = 0.007Ml/d so surplus of 0.011Ml/d • Existing GW maintained • Existing source (Skibbereen-Clonakilty GWB) WFD status 2016-2021 – Good • New source (Skibbereen-Clonakilty GWB) WFD status 2016-2021 – Good
SAI-508 0500SC0007 Tarelton	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Tarelton WRZ in projected surplus so WTP upgrade works only • Tarelton WRZ current WAFU DYCP 2044 = 0.018Ml/d, DYCP 2044 demand = 0.007Ml/d so surplus of 0.011Ml/d • Existing GW maintained • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-630 1300SC0019 Kenmare / Kilgarvan	-1	**New SW abstraction from Kenmare River and new WTP** • Kenmare / Kilgarvan WRZ in deficit so new SW abstraction and new WTP to meet WRZ future deficit • Kenmare / Kilgarvan WRZ current WAFU DYCP 2044 = 0.508Ml/d, DYCP 2044 demand = 1.778Ml/d so an additional 1.27Ml/d required to meet WRZ deficit • Existing SW maintained • New source (Inner Kenmare River TWB) WFD status 2016-2021 – Good
SAI-643 1300SC0018 Sneem PWS	-1	**Increase SW abstraction from Lough Dromtine** • Sneem PWS WRZ in deficit so increase existing SW abstraction to meet WRZ future deficit • Sneem PWS WRZ current WAFU DYCP 2044 = 0.528Ml/d, DYCP 2044 demand = 0.888Ml/d so an additional 0.36Ml/d required to meet WRZ deficit • Existing SW maintained • Existing source (Dromtine LWB) WFD status 2016-2021 – Good
SAI-526 0500SC0169 Johnstown	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Johnstown WRZ in projected surplus so WTP upgrade works only • Johnstown WRZ current WAFU DYCP 2044 = 0.014Ml/d, DYCP 2044 demand = 0.011Ml/d so surplus of 0.003Ml/d • Existing GW maintained • Existing source (Bandon GWB) WFD status 2016-2021 – Good
SAI-645 1300SC0029 Kilgarvan	-2	**New GW abstraction and new WTP** • Kilgarvan WRZ in deficit so increase existing SW abstraction to meet WRZ future deficit • Kilgarvan WRZ current WAFU DYCP 2044 = 0.528Ml/d, DYCP 2044 demand = 0.541Ml/d so an additional 0.013Ml/d required to meet WRZ deficit • Existing SW maintained • Existing source (Coomclogherane LWB) WFD status 2016-2021 – High • New source (Kenmare GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-652 1300SC0027 Lauragh PWS	-1	**New SW abstraction from Glenmore Lake and upgrade WTP** • Lauragh PWSS WRZ in deficit so increase existing SW abstraction to meet WRZ future deficit • Lauragh PWSS WRZ current WAFU DYCP 2044 = 0.066Ml/d, DYCP 2044 demand = 0.126Ml/d so an additional 0.06Ml/d required to meet WRZ deficit • Existing SW maintained • Existing source (Croanshagh RWB) WFD status 2016-2021 – Good • New source (Glanmore LWB) WFD status 2016-2021 – Good
SAI-660 0500SC0026 Kilcrohane	-1	**New GW abstraction and abandon existing GW source. New WTP** • Kilcrohane WRZ in deficit so new GW abstraction to meet WRZ future full demand • Kilcrohane WRZ current WAFU DYCP 2044 = 0.083Ml/d, DYCP 2044 demand = 0.096Ml/d so an additional 0.013Ml/d required to meet WRZ full demand • Existing GW decommissioned • Existing source (Bearna Sneem GWB) WFD status 2016-2021 – Good • New source (Bearna Sneem GWB) WFD status 2016-2021 – Good
SAI-768 0500SC0037 Dursey Island	-2	**New raw water storage for this WRZ. Based on requiring 100 days supply of 0.013Ml/d deficit** • Dursey WRZ in projected surplus • WTP upgrade works and new raw water storage • Dursey WRZ current WAFU DYCP 2044 = 0.018Ml/d, DYCP 2044 demand = 0.014Ml/d so surplus of 0.004Ml/d. • Existing GW maintained • Existing source (Bearna Sneem Islands GWB) WFD status 2016-2021 – Good
SAI-771 0500SC0008 Inchigeelagh	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Inchigeelagh WRZ in projected surplus so WTP upgrade works only • Inchigeelagh WRZ current WAFU DYCP 2044 = 0.11Ml/d, DYCP 2044 demand = 0.105Ml/d so surplus of 0.005Ml/d • Existing GW maintained • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-772 0500SC0028 Caheragh	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Caheragh WRZ in projected surplus so WTP upgrade works only • Caheragh WRZ current WAFU DYCP 2044 = 0.092Ml/d, DYCP 2044 demand = 0.06Ml/d so surplus of 0.031Ml/d • Existing GW maintained • Existing source (Skibbereen-Clonakilty GWB) WFD status 2016-2021 – Good
SAI-774 0500SC0078 Kilnamartyra	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Kilnamartyra WRZ not in deficit so WTP upgrade works only • Kilnamartyra WRZ current WAFU DYCP 2044 = 0.072Ml/d, DYCP 2044 demand = 0.071Ml/d so surplus of 0.001Ml/d • Existing GW maintained • Existing source (Ballinhassig West GWB) WFD status 2016-2021 – Good
SAI-778 0500SC0147 Ratharoon	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Ratharoon WRZ in projected surplus so WTP upgrade works only • Ratharoon WRZ current WAFU DYCP 2044 = 0.006Ml/d, DYCP 2044 demand = 0.005Ml/d so surplus of 0.001Ml/d • Existing GW maintained • Existing source (Bandon GWB) WFD status 2016-2021 – Good
SAI-779 0500SC0154 Lyre Clonakilty	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Lyre Clonakilty WRZ not in deficit, WTP upgrade works only • Existing GW maintained • Existing source (Skibbereen-Clonakilty GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-784 0500SC0025 Crookhaven	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Crookhaven WRZ in projected surplus so WTP upgrade works only • Crookhaven WRZ current WAFU DYCP 2044 = 0.16Ml/d, DYCP 2044 demand = 0.134Ml/d so surplus of 0.026Ml/d • Existing SW maintained • Existing source (Tooreen LWB) WFD status 2016-2021 – Good
SAI-780 0500SC0155 Cape Clear	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Cape Clear WRZ in projected surplus so WTP upgrade works only • Cape Clear WRZ current WAFU DYCP 2044 = 0.076Ml/d, DYCP 2044 demand = 0.064Ml/d so surplus of 0.012Ml/d • Existing GW maintained • Existing source (Bandon Islands) WFD status 2016-2021 – Good
SAI-781 0500SC0157 Bilberry	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Bilberry WRZ in projected surplus so WTP upgrade works only • Bilberry WRZ current WAFU DYCP 2044 = 0.014Ml/d, DYCP 2044 demand = 0.012Ml/d so surplus of 0.002Ml/d • Existing GW maintained • Existing source (Midleton GWB) WFD status 2016-2021 – Good
SAI-083 **(Part of Grouped Option SAI-820)** 0500SC0013 Newcestown	0	**Increase GW abstraction and rationalise Mossgrove to Newcestown WRZ for increased resilience** • Newcestown WRZ in projected surplus • Increase existing GW abstraction to meet WRZ future demand from rationalisation • Newcestown WRZ current WAFU DYCP 2044 = 0.041Ml/d, DYCP 2044 demand = 0.018Ml/d so surplus of 0.023Ml/d • Existing GW maintained • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-105 **(Part of Grouped Option SAI-820)** 0500SC0014 Mossgrove	0	**Rationalise Mossgrove to Newcestown WRZ for increased resilience** • Mossgrove WRZ in projected surplus but is to be rationalised to Newcestown WRZ • Mossgrove WRZ current WAFU DYCP 2044 = 0.011Ml/d, DYCP 2044 demand = 0.003Ml/d so surplus of 0.008Ml/d • Existing GW is to be decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-231 **(Part of Grouped Option SAI-877)** 0500SC0162 Mogeely	-1	**Increase existing GW abstraction from infiltration gallery and supply deficit** • Mogeely WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Mogeely WRZ current WAFU DYCP 2044 = 1.054Ml/d, DYCP 2044 demand = 1.139Ml/d so additional 0.085Ml/d required to meet WRZ future deficit • Existing GW maintained • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-293 **(Part of Grouped Option SAI-877)** 0500SC0044 Dungourney	-1	**Rationalise Dungourney WTP to Mogeely WRZ** • Dungourney WRZ in deficit but is to be rationalised to Mogeely WRZ • Dungourney WRZ current WAFU DYCP 2044 = 0.038Ml/d, DYCP 2044 demand = 0.054Ml/d so an additional 0.016Ml/d required to meet WRZ deficit • Existing GW is to be decommissioned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-399 **(Part of Grouped Option SAI-897)** 0500SC0012 Dunmanway	-1	**Interconnect Dunmanway and Drinagh WRZ. Supply deficit from Curraghlicky Lake** • Dunmanway WRZ in deficit but is to be interconnected with Drinagh WRZ • Dunmanway WRZ current WAFU DYCP 2044 = 0.878Ml/d, DYCP 2044 demand = 1.032Ml/d so an additional 0.154Ml/d required to meet WRZ deficit • Existing SW maintained • Existing source (Coolkellure LWB) WFD status 2016-2021 – Moderate

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-434 **(Part of Grouped Option SAI-897)** 0500SC0038 Drinagh	-1	**Increase SW abstraction from Curraghlicky Lake and upgrade WTP** • Drinagh WRZ in deficit so increase existing SW abstraction to supply WRZ future deficit • Drinagh WRZ current WAFU DYCP 2044 = 0.226Ml/d, DYCP 2044 demand = 0.245Ml/d so an additional 0.019Ml/d required to meet WRZ deficit • Existing SW maintained • Existing source (Curraghalicky LWB) WFD status 2016-2021 – Poor
SAI-641 **(Part of Grouped Option SAI-923)** 1300SC0017 Caherdaniel / Castlecove	-2	**Supplement Caherdaniel from Waterville** • Caherdaniel / Castlecove WRZ in deficit • Supplement Caherdaniel / Castlecove WRZ from Waterville PWS 075H WRZ to supply WRZ future deficit • Caherdaniel / Castlecove WRZ current WAFU DYCP 2044 = 0.056Ml/d, DYCP 2044 demand = 0.935Ml/d so an additional 0.879Ml/d required to meet WRZ deficit • Existing SW maintained • Existing source (Currane LWB) WFD status 2016-2021 – Moderate
SAI-642 **(Part of Grouped Option SAI-923)** 1300SC0023 Waterville PWS 075H	-2	**Increase abstraction from Lough Currane and supply Caherdaniel** • Waterville PWS 075H WRZ in projected surplus • Increase existing SW abstraction to supply WRZ future deficit in Caherdaniel / Castlecove WRZ • Waterville PWS 075H WRZ current WAFU DYCP 2044 = 1.826Ml/d, DYCP 2044 demand = 1.811Ml/d so surplus of 0.015Ml/d • Existing SW maintained • Existing source (Currane LWB) WFD status 2016-2021 – Moderate
SAI-830 **(Part of Grouped Option SAI-949)** 0500SC0042 Youghal Regional	-3	**New GW abstraction (karstic) and new WTP to supply deficit** • Youghal Regional WRZ in deficit • New GW abstraction and new WTP to supply WRZ future deficit • Youghal Regional WRZ current WAFU DYCP 2044 = 2.796Ml/d, DYCP 2044 demand = 4.242Ml/d so an additional 1.446Ml/d required to meet WRZ deficit • Existing SW and GW maintained • New source (Glenville GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-832 **(Part of Grouped Option SAI-949)** 0500SC0041 Ballymacoda	-3	**Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal (new GW source)** • Ballymacoda WRZ in deficit and is to be rationalised to Youghal Regional WRZ • Ballymacoda WRZ current WAFU DYCP 2044 = 0.11Ml/d, DYCP 2044 demand = 0.172Ml/d so an additional 0.062Ml/d required to meet WRZ deficit • Existing source (Knockadoon East GWB) WFD status 2016-2021 – Good • New source (Glenville GWB) WFD status 2016-2021 – Good
SAI-833 **(Part of Grouped Option SAI-949)** 0500SC0040 Kilcraheen	-3	**Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal (new GW source)** • Kilcraheen WRZ in deficit and is to be rationalised to Youghal Regional WRZ • Kilcraheen WRZ current WAFU DYCP 2044 = 0.013Ml/d, DYCP 2044 demand = 0.047Ml/d so an additional 0.035Ml/d required to meet WRZ deficit • Existing GW abandoned • Existing sources (Midleton GWB) WFD status 2016-2021 – Good • New source (Glenville GWB) WFD status 2016-2021 – Good
SAI-831 **(Part of Grouped Option SAI-949)** 0500SC0039 Knockadoon	-3	**Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal (new GW source)** • Knockadoon WRZ in deficit and is to be rationalised to Youghal Regional WRZ • Knockadoon WRZ current WAFU DYCP 2044 = 0.066Ml/d, DYCP 2044 demand = 0.157Ml/d so an additional 0.091Ml/d required to meet WRZ deficit • Existing GW abandoned • Existing source (Knockadoon East GWB) WFD status 2016-2021 – Good • New source (Glenville GWB) WFD status 2016-2021 – Good
SAI-837 **(Part of Grouped Option SAI-950)** 0500SC0085 Killeagh	-1	**Increase GW abstraction (karstic) and supply deficit** • Killeagh WRZ in deficit so increase existing GW abstraction to meet WRZ future deficit • Killeagh WRZ current WAFU DYCP 2044 = 0.211Ml/d, DYCP 2044 demand = 0.422Ml/d so an additional 0.211Ml/d required to meet WRZ deficit • Existing GW maintained • Existing source (Midleton GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-836 **(Part of Grouped Option SAI-950)** 0500SC0084 Ballykilty	-1	**Rationalise Ballykilty to Killeagh WRZ** • Ballykilty WRZ in deficit and is to be rationalised to Killeagh WRZ • Ballykilty WRZ current WAFU DYCP 2044 = 0.039Ml/d, DYCP 2044 demand = 0.054Ml/d so an additional 0.016Ml/d required to meet WRZ deficit • Existing GW abandoned • Existing source (Ballinhassig East GWB) WFD status 2016-2021 – Good
SAI-861 **(Part of Grouped Option SAI-955)** 0500SC0030 Bantry	-2	**New Inchybegga Impoundment (Cullomane) and new WTP. To supply Bantry deficit and transfer west to supply WRZs full demands** • Bantry WRZ in deficit • New Impoundment and new WTP to meet WRZ future deficit and rationalised WRZs future full demands. • Bantry WRZ current WAFU DYCP 2044 = 2.138Ml/d, DYCP 2044 demand = 3.075Ml/d so an additional 0.937Ml/d required to meet WRZ deficit • Existing SW maintained • New source (Owennashingaun) WFD status 2016-2021 – High
SAI-865 **(Part of Grouped Option SAI-955)** 0500SC0034 Castletownbere	-2	**Rationalise to Bantry (new Inchybegga Impoundment source)** • Castletownbere WRZ in deficit and is to be rationalised to Bantry WRZ • Castletownbere WRZ current WAFU DYCP 2044 = 0.222Ml/d, DYCP 2044 demand = 0.514Ml/d so an additional 0.292Ml/d required to meet WRZ deficit • New source (Owennashingaun) WFD status 2016-2021 – High
SAI-862 **(Part of Grouped Option SAI-955)** 0500SC0068 Glengarriff	-2	**Rationalise to Bantry (new Inchybegga Impoundment source)** • Glengarriff WRZ in deficit and is to be rationalised to Bantry WRZ. • Glengarriff WRZ current WAFU DYCP 2044 = 0.222Ml/d, DYCP 2044 demand = 0.514Ml/d so an additional 0.292Ml/d required to meet WRZ deficit • New source (Owennashingaun) WFD status 2016-2021 – High

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-863 **(Part of Grouped Option SAI-955)** 0500SC0033 Adrigole	-2	**Rationalise to Bantry (new Inchybegga Impoundment source)** • Adrigole WRZ in deficit and is to be rationalised to Bantry WRZ • Adrigole WRZ current WAFU DYCP 2044 = 0.166Ml/d, DYCP 2044 demand = 0.346Ml/d so an additional 0.18Ml/d required to meet WRZ deficit • New source (Owennashingaun) WFD status 2016-2021 – High
SAI-864 **(Part of Grouped Option SAI-955)** 0500SC0181 Reenmeen West	-2	**Rationalise to Bantry (new Inchybegga Impoundment source)** • Reenmeen West WRZ in deficit and is to be rationalised to Bantry WRZ. • Reenmeen West WRZ current WAFU DYCP 2044 = 0.017Ml/d, DYCP 2044 demand = 0.023Ml/d so an additional 0.006Ml/d required to meet WRZ deficit • New source (Owennashingaun) WFD status 2016-2021 – High
SAI-883 **(Part of Grouped Option SAI-960)** 0500SC0035 Allihies	-2	**Rationalise Allihies to Ballydonegan GWS** • Allihies WRZ in deficit and is to be rationalised to Ballydonegan GWS • Allihies WRZ current WAFU DYCP 2044 = 0.062Ml/d, DYCP 2044 demand = 0.063Ml/d so an additional 0Ml/d required to meet WRZ deficit • Existing SW and GW are to be abandoned • Existing source (Bearna Sneem GWB) WFD status 2016-2021 – Good and (Allihies Reservoir) WFD status 2016-2021 - Unassigned
SAI-882 **(Part of Grouped Option SAI-960)** 0500SC0170 Cluain Court Allihies	-2	**Rationalise Cluain Court Allihies to Allihies** • Cluain Court Allihies WRZ in projected surplus but is to be rationalised to Allihies WRZ • Cluain Court Allihies WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.006Ml/d so surplus of 0.003Ml/d • Existing GW is to be abandoned • Existing source (Bearna Sneem GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-888 **(Part of Grouped Option SAI-962)** 0500SC0021 Skibbereen 2 (Baltimore and Schull)	-1	**Upgrade Lake Cross WTP and supply deficit from Skibbereen 1 WRZ** • Skibbereen 2 WRZ in deficit so interconnect with Skibbereen 1 WRZ and WTP upgrade works • Skibbereen 2 WRZ current WAFU DYCP 2044 = 1.498Ml/d, DYCP 2044 demand = 1.816Ml/d so an additional 0.318Ml/d required to meet WRZ deficit • Existing SW maintained • Existing sources (Skeagh LWB) WFD status 2016-2021 – Moderate and (Abisdealy LWB) WFD status 2016-2021 – Moderate
SAI-887 **(Part of Grouped Option SAI-962)** 0500SC0173 Skibbereen 1 (Ballyhilty and Drimoleague)	-1	**Upgrade Ballyhilty WTP and supply spare capacity to Skibbereen 2 - Baltimore and Schull WRZ** • Skibbereen 1 WRZ in projected surplus so WTP upgrade works and interconnect with Skibbereen 2 WRZ • Skibbereen 1 WRZ current WAFU DYCP 2044 = 7.578Ml/d, DYCP 2044 demand = 6.496Ml/d so surplus of 1.082Ml/d • Existing SW maintained • Existing source (Ilen RWB) WFD status 2016-2021 – High
SAI-889 **(Part of Grouped Option SAI-963)** 0500SC0017 Nohoval	-1	**Rationalise Nohoval and Minane Bridge WRZs and supply deficit from Minane WRZ** • Nohoval WRZ in deficit and is to be rationalised to Minane Bridge WRZ • Skibbereen 1 WRZ current WAFU DYCP 2044 = 0.028Ml/d, DYCP 2044 demand = 0.061Ml/d so additional 0.033Ml/d required to meet WRZ deficit • Existing GW to be abandoned • Existing source (Bandon GWB) WFD status 2016-2021 – Good
SAI-890 **(Part of Grouped Option SAI-963)** 0500SC0083 Minane Bridge	-1	**New GW abstraction and upgrade Minane Bridge WTP** • Minane Bridge WRZ in projected surplus • New GW abstraction and WTP upgrade works to meet WRZ full demand • Minane Bridge WRZ current WAFU DYCP 2044 = 0.055Ml/d, DYCP 2044 demand = 0.044Ml/d so surplus of 0.011Ml/d • Existing GW abandoned • Existing source (Bandon GWB) WFD status 2016-2021 – Good • New source (Bandon GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAI-964 **(Part of Grouped Option SAI-963)** 0500SC0016 Roberts Cove	-1	**Rationalise Roberts Cove and Minane Bridge WRZs and supply deficit from Minane WRZ** • Roberts Cove WRZ in deficit and is to be rationalised to Minane Bridge WRZ • Roberts Cove WRZ current WAFU DYCP 2044 = 0.042Ml/d, DYCP 2044 demand = 0.043Ml/d so additional 0.001Ml/d required to meet WRZ deficit • Existing GW abandoned • Existing source (Bandon GWB) WFD status 2016-2021 – Good • New source (Bandon GWB) WFD status 2016-2021 – Good

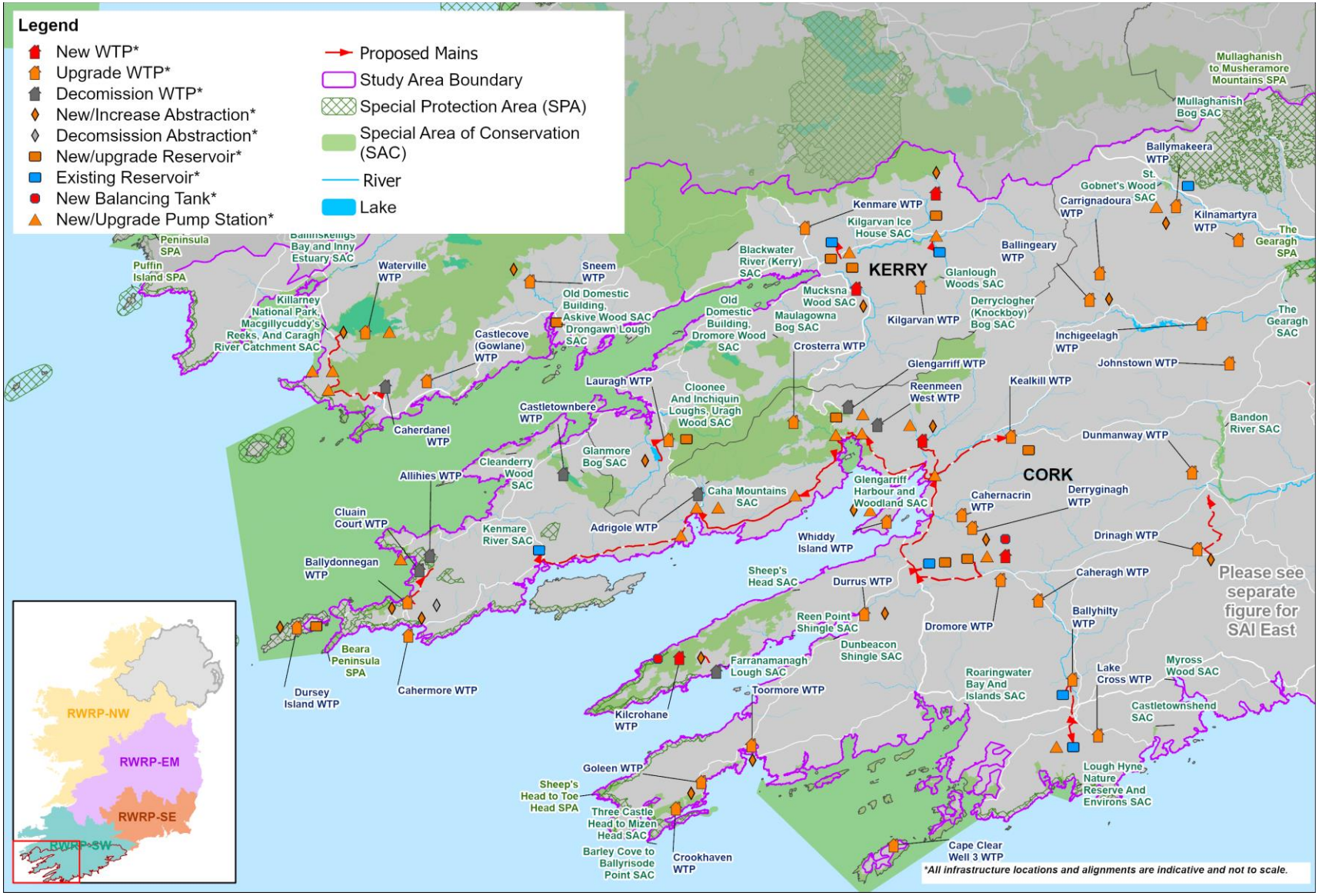

Figure 4.5a - Study Area I (West) – Preferred Approach and European sites

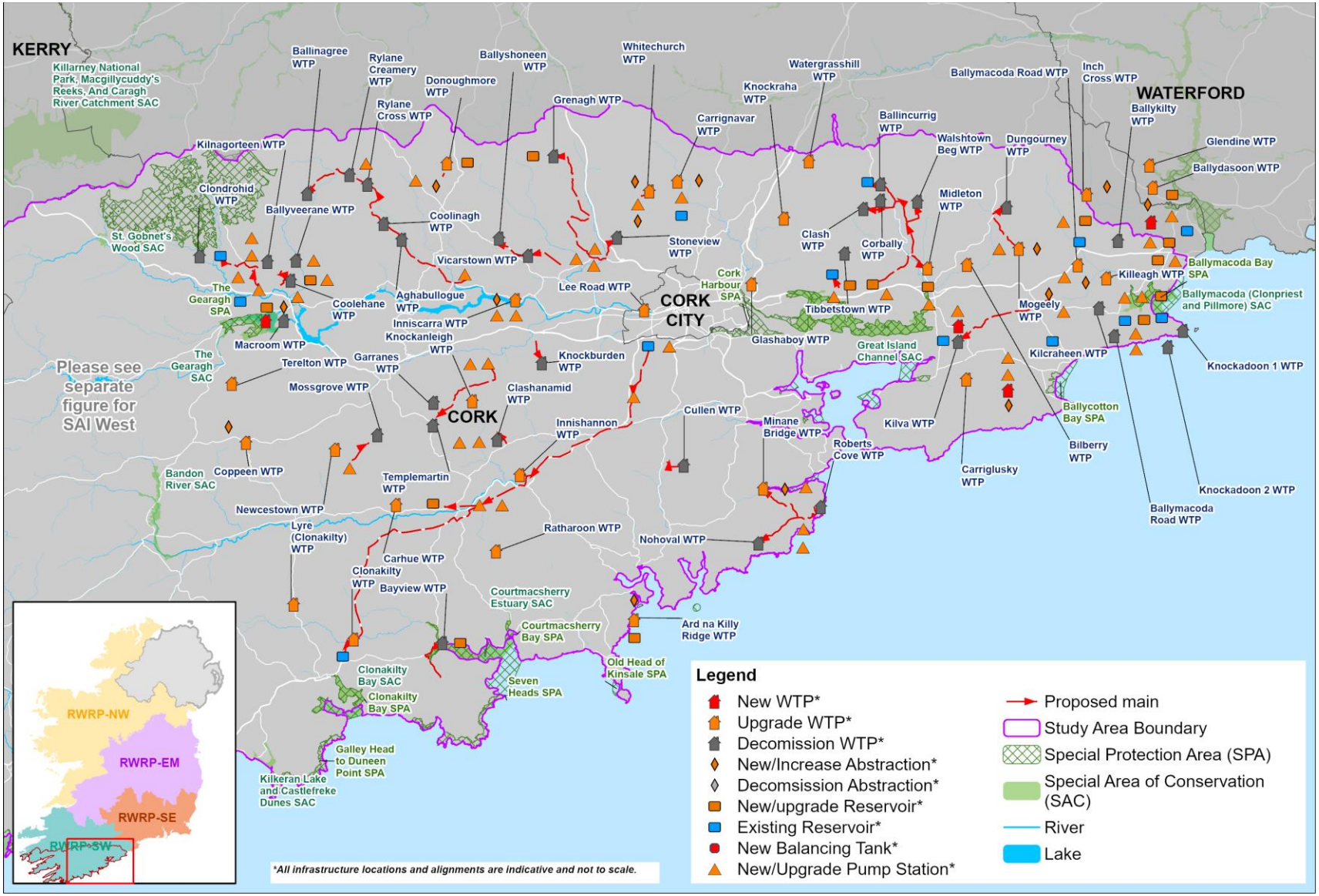

Figure 4.5b - Study Area I (East) – Preferred Approach and European sites

4.4 Overview of Study Area J – North Cork/West Waterford

The location of Study Area J (SAJ) in relation to the SW region is shown in Figure 4.1 above. The Study Area extends from Grallagh to the north western area of County Cork. The total area of SAJ is approximately 3,000km^2 and it lies within the counties of Cork, Waterford, Limerick, Tipperary and Kerry. The principal settlement (with a population of over 10,000) within SAJ is Mallow (Central Statistics Office, 2016).

There are six SACs and five SPAs within SAJ as shown in Table 4.7. European sites within SAJ where there is potential for LSE are discussed further in Section 6.2.3.

Table 4.7 - Number of European Sites within SAJ

Study Area	No. of SACs	No. of SPAs
J (North Cork/West Waterford)	6	5

4.4.1 Existing Water Supplies

SAJ North Cork/West Waterford serves approximately 80,000 people by the public network via 62 WRZs and 1,668km of distribution network. The Study Area is summarised in Figure 4.6 below. The existing sources of water include 75 groundwater sources and five surface water sources.

Groundwater supplies are the dominant source of supply for the region. These groundwater sources are replenished by winter rainfall to meet higher demand in the spring and summer. The predominant aquifer type of the area is made up of poorly productive bedrock (74%), followed by karstic (24%) and productive fissured (3%). There have been no major sand and gravel aquifers mapped in SAJ.

Devonian Old Red Sandstone consist mainly of coarse and fine sandstones, siltstones, shales, and conglomerates, and along with the Namurian Shales, make up the dominant bedrock geology in SAJ. These rocks 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 15-20 metres 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.

The karst forms a key regionally important aquifer in some areas, namely around the low-lying valleys between Mallow and Charleville in Cork. The Southern Region is predominantly characterised by a more diffuse network of flow pathways (Regionally Important Karstified Bedrock type aquifers), where the distribution of permeability, and hence yield, is more homogenous. The karst system of North Cork appears more complex and is likely comprised of enlarged channels (conduit flow), formed from solution at depth, and other karst features at the surface (represented by springs), and a deeper diffuse type groundwater flowing south. A number of relatively large abstractions taking place in this region include Castletownroche, Box Cross and Shanballymore.

The Kiltorcan Sandstones make up the productive fissured aquifers in this region and can be found in a narrow band through north east Cork and into Waterford. In general, optimum well yields will be from wells that penetrate to a depth at least 50-100m and near a significant structural feature such as an anticline or fault. It is likely the abstraction at Charleville receives much of the groundwater inflow from this rock unit.

Overall, 75 groundwater sources are managed by Irish Water in the region, with the majority of the smaller abstractions taking place from the sandstones, producing yields averaging 0.12– 0.35Ml/d.

The higher abstraction volumes generally take place in the karst, with a number of large springs issuing from bedding planes marking a change in lithology. These springs can at times provide very large overflows, and under the GSI classification scheme, would be regarded as large springs (>2.16Ml/d).

Furthermore, one groundwater abstraction is from an infiltration gallery located along the Blackwater River. This abstraction has been classified as a groundwater abstraction, however, it is noted that the source of supply is both surfacewater and groundwater.

Regarding surface water availability, SAJ is almost entirely within the Blackwater (Munster) catchment, except for a small part in the far north of the Study Area crossing into the Shannon Estuary South catchment. The River Blackwater is one of the largest rivers in Ireland, with a total catchment area of 3,310km^2, draining a major part of County Cork and five ranges of mountains. The Blackwater rises in the Mullaghareirk Mountains in County Kerry and flows east through County Cork, draining the Study Area as it passes through the towns of Mallow and Fermoy, then into County Waterford before entering the Celtic Sea at Youghal. The Blackwater basin is primarily composed of Devonian and Carboniferous sedimentary rocks. Broadly speaking the geology consists of east-west trending anticlines (sandstone ridges) and synclines (limestone valleys), which have an overriding control on nature of the drainage systems. The catchment is designated as the Blackwater River (Cork/Waterford) SAC, with a large portion of this also designated as a freshwater pearl mussel SAC Catchment, therefore requiring to achieve high ecological status and WFD objectives.

Approximately a quarter of the water supplies to the Study Area come from five surface water sources within the Blackwater catchment. The surface water abstractions are on some of the main tributaries of the Blackwater. Conna Regional WRZ has an abstraction from the River Bride, Allow WRZ is supplied from the River Allow, Mitchelstown WRZ abstracts from the Behanagh River, whilst Mallow WRZ has an intake on the Clyda River and a small impounding reservoir source Fiddane Reservoir.

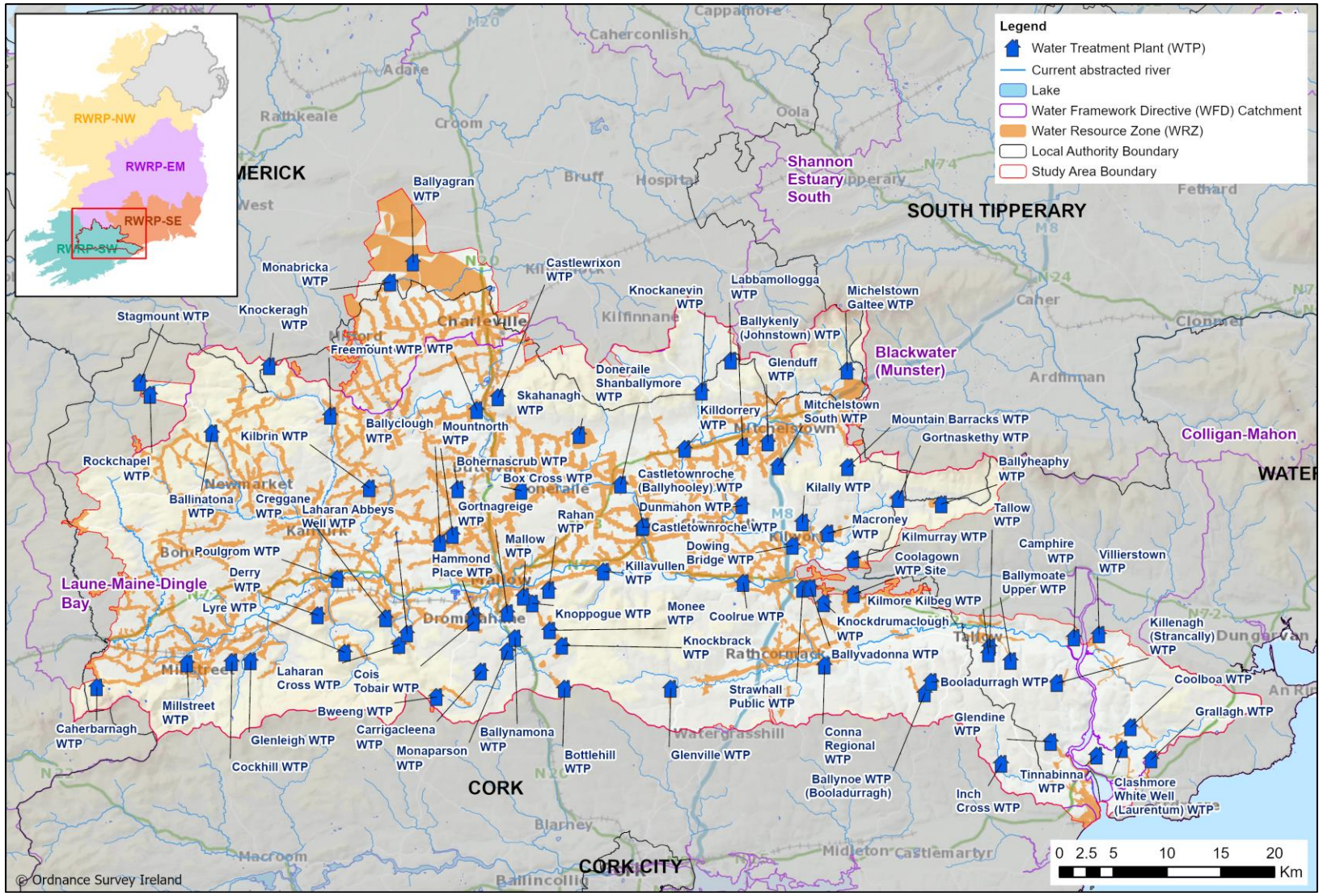

Figure 4.6 - Study Area J North Cork/West Waterford Summary

4.4.2 SAJ Options Removed at Coarse/Fine Screening

The options detailed in Table 4.8 below were removed at Coarse/Fine Screening on environmental grounds.

Table 4.8 - SAJ – Options removed at Coarse/Fine Screening on environmental grounds

Option Reference	Option Description	Rejection Reasoning
SAJ-009	New SW abstraction from the Dalua River and new WTP to partly supply deficit.	The Dalua River is a WFD high-status waterbody, and the abstraction point is within the SAC region. The river could supply approximately one third of the deficit. Therefore, this option was rejected at coarse screening.
SAJ-020	New connection to New Shannon Source to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs via Newcastle West.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-030	New connection to New Shannon Source to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs via Newcastle West.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-033	Rationalise Charleville/Doneraile to Glenosheen/Jamestown/ Kilmallock WRZ (Jamestown springs) WRZ. Develop additional wells at Jamestown Spring and new WTP.	Interconnection is a better option and additional yield of 14 MLD required from Jamestown springs. As a result, this option is not taken forward to the fine screening stage as rationalisation is not considered feasible.
SAJ-040	Increase existing SW abstraction/raw water storage from Fiddane Reservoir and upgrade existing Mallow WTP to supply deficit.	Abstraction based on 5% of Q50 is <0.5Ml/d, thus any increase of abstraction (if possible) can only fulfil only a fraction of the large deficit at Mallow WRZ. There is also the possibility of over abstraction from this source. Therefore, this option was rejected at coarse screening stage.
SAJ-041	Increase existing SW abstraction from Clyda River Intake and upgrade existing Mallow WTP to supply deficit.	An allowable abstraction of 5% of Q95 (full abstraction) can fulfil just above 50% of the deficit. There is also the possibility of over abstraction from this source. Therefore, this option was rejected at coarse screening stage.
SAJ-049	New connection to New Shannon Source to feed Newmarket, Charleville/Doneraile, Mallow and Allow Regional WRZs via Newcastle West.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-056	New SW abstraction from Funshion River and new WTP to supply deficit.	This option cannot meet deficit and is within an FWPM catchment. As the deficit is not met this option was rejected at coarse screening stage.

Option Reference	Option Description	Rejection Reasoning
SAJ-057	New SW abstraction from Funshion River and new WTP to supply deficit.	Option does not cover full deficit and requires significant amount of pipeline. Therefore, the option was rejected at coarse screening stage.
SAJ-058	Increase existing abstraction from Behanagh River and upgrade Mitchelstown Galtee WTP to partly supply deficit.	This option included increasing the abstraction at Behanagh River to partly supply deficit. The Behanagh River is a WFD high status waterbody. The total allowable abstraction at 5% of Q95 is approximately 10-15% of the deficit. As the option will not meet deficit it was rejected at coarse screening.
SAJ-059	Increase existing abstraction from Behanagh River and upgrade Mitchelstown Galtee WTP to partly supply deficit.	This option included increasing the abstraction at Behanagh River to partly supply deficit. There are yield issues associated with this option and an increase in SW abstraction is not possible, therefore, this option was rejected at coarse screening.
SAJ-060	Increase existing abstraction from Behanagh River and upgrade Mitchelstown Galtee WTP to partly supply deficit.	This option included increasing the abstraction at Behanagh River to partly supply deficit. There are issues around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-072	Increase existing abstraction at Cockhill BH and upgrade Cockhill WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-092	Increase GW abstraction at Kildorrery (Glenavuddig) BH and upgrade existing Killdorrery WTP to supply deficit.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-096	Increase GW abstraction from Kildorrery (Ballyvisteen) spring and upgrade existing Ballyvisteen WTP to supply deficit.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-097	Increase GW abstraction from existing Kilally (Kilworth) BH and upgrade Kilally WTP to supply deficit.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-105	Increase GW abstraction from Johnstown (BH) and upgrade Ballykenley (Johnstown) WTP to supply deficit.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-107	Increase GW abstraction from existing BH and upgrade Dunmahon WTP to supply deficit.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.

Option Reference	Option Description	Rejection Reasoning
SAJ-117	Increase SW abstraction from River Allow and upgrade Freemount WTP.	The option does not address full deficit, as the estimated allowable abstraction is limited. Therefore, this option was rejected at coarse screening stage.
SAJ-121	New connection to New Shannon Source to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs via Newcastle West.	The option requires a significant length of new and upgraded pipeline for a relatively small supply. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-130	Increase GW abstraction no. 2 BHs and upgrade Creggane WTP to supply deficit.	This option proposes an increase GW abstraction to supply deficit. This option was deemed not feasible due to high turbidity.
SAJ-131	Increase GW abstraction from no. 2 BHs and upgrade Creggane WTP to supply deficit.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-147	New SW abstraction from Clyda River and new WTP to supply deficit.	This option included increasing the abstraction at River Clyde to partly supply deficit. The total allowable abstraction at 5% of Q95 is approximately one third of the deficit. As the option will not meet deficit it was rejected at coarse screening.
SAJ-165	Rationalise Lombardstown Glantane to Banteer WRZ (Creggane WTP).	This option recommends rationalising Lombardstown Glantane to Banteer WRZ but there are existing issues with yield. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-198	Interconnect Monabricka with South West Regional Scheme WRZ and supply deficit (Castlemahon WTP).	This option recommends interconnecting Monabricka with South West Regional Scheme WRZ. There are issues around available yield and an increase in SW abstraction is not possible. As a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-255	Rationalise Labbamollogga to Mitchelstown WRZ (Mitchelstown Galtee WTP).	This option recommends rationalising Labbamollogga to Mitchelstown WRZ. There are issues around available yield and an increase in SW abstraction is not possible. As a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-264	Interconnect Knockeragh and South West Regional WRZs and supply deficit from South West Regional (Tobergal springs).	This option proposes to supply deficit from South West Regional (Tobergal springs). Tobergal appears to be over abstracting (See SAH). Therefore, this option is not taken forward to the fine screening stage.

Option Reference	Option Description	Rejection Reasoning
SAJ-280	Rationalise Mountain Barracks to Mitchelstown WRZ (Mitchelstown Galtee WTP).	There are issues around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-290	Rationalise Castletown Ballyagran to South West Regional WRZ (Castlemahon WTP).	There are issues around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-308	New SW abstraction from Knockmeelmore River and new WTP to supply deficit.	This option recommends a new SW abstraction from Knockmeelmore River. This is not a resilient supply and cannot meet deficit based on 10% of Q95. Therefore, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-316	New SW abstraction from Kilmaloo Lake and new WTP to supply deficit.	This option recommends a new SW abstraction from Kilmaloo Lake. This is categorised not as a lake but as a wetland. Therefore, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-327	New connection to New Shannon Source to feed Newmarket, Charleville/ Doneraile, Mallow Allow Regional [full demand] and Cork City [deficit] WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-328	New connection to Limerick City (increase SW abstraction at Clareville WTP) to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-329	New connection to Limerick City (New Shannon Source) to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-330	New connection to New Shannon Source to feed Newmarket, Charleville/ Doneraile, Mallow Allow Regional [full demand] and Cork City [deficit] WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-331	New connection to Limerick City (increase SW abstraction at Clareville WTP) to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.

Option Reference	Option Description	Rejection Reasoning
SAJ-332	New connection to Limerick City (New Shannon Source) to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-333	New connection to New Shannon Source to feed Newmarket, Charleville/ Doneraile, Mallow Allow Regional [full demand] and Cork City [deficit] WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-334	New connection to Limerick City (increase SW abstraction at Clareville WTP) to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-335	New connection to Limerick City (New Shannon Source) to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-336	New connection to New Shannon Source to feed Newmarket, Charleville/ Doneraile, Mallow Allow Regional [full demand] and Cork City [deficit] WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-337	New connection to Limerick City (increase SW abstraction at Clareville WTP) to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-338	New connection to Limerick City (New Shannon Source) to feed Newmarket, Charleville/ Doneraile, Mallow and Allow Regional WRZs.	The yield associated with this option is limited and would require long pipelines. Transferring small quantities of water over long distances can affect the quality of water. Therefore, as there were other viable options for these WRZs this option was not considered feasible at coarse screening stage.
SAJ-343	New SW abstraction from Knockananig Reservoir and treat water at Coolrue WTP (full treatment needed for SW source). This source was historically used to supply Fermoy.	This option proposes a new SW abstraction to meet 1.251Ml/d deficit. However only 0.054Ml/d is available. This option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.

Option Reference	Option Description	Rejection Reasoning
SAJ-372	Increase existing GW abstraction and upgrade Tallow WTP.	There is a great uncertainty around available yield and as a result, this option is not considered feasible at coarse screening stage and would not be taken forward to the fine screening stage.
SAJ-016	Interconnect Newmarket and Central Regional - Lough Guitane WRZs and supply deficit from Central Regional - Lough Guitane.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.
SAJ-075	Interconnect Millstreet and Central Regional - Lough Guitane WRZ and supply deficit from Central Regional - Lough Guitane.	Abstracting the volume of water required to make this a feasible option is considered likely to result in the waterbody not achieving good WFD status.

4.4.3 Preferred Approach for SAJ

Full details of the Preferred Approach (and how it was reached) are included in the SAJ Technical Report in Appendix 3 of the RWRP-SW. The final Preferred Approach for SAJ is shown in Table 4.9 below. The findings of the Preferred Approach Development for SAJ North Cork/West Waterford include the following:

- Five options score a 0 in relation to potential impact on a designated European Site.
- There are three -3 scores against designated European sites within the Preferred Approach; Group options SAJ-629, SAJ-630 and SAJ-631.
- The remaining options within the Preferred Approach have either a -1 or a -2 score against European sites.

In summary, the Preferred Approach for SAJ is the Combination 12 approach which consists of local WRZ options for 14 of the 62 WRZs in the Study Area, primarily driven by the small scale of the supplies and difficulties in transporting small volumes of water over long distances.

The Preferred Approach will result in a reduction of WRZs from 62 to 30. 39 of the existing 80 abstractions in SAJ are proposed to be decommissioned, providing significant environmental and operational benefits.

The Preferred Approach provides environmental benefits by allowing Irish Water to decommission the existing groundwater source at Kilbrin WTP which was identified at potential drought and to decommission the River Allow source which may not meet the sustainability guideline during dry weather flows.

The Preferred Approach for SAJ North Cork/West Waterford 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).
- Continuation of Irish Water 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 a number of WTPs (for example Freemount WTP, Killavullen WTP, Clashmore White Well (Laurentum) WTP, Caherbarnagh WTP and Stagmount WTP) which currently extract from European sites including Blackwater River (Cork/Waterford) SAC, Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC and Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA.

All of the options that make up the final Preferred Approach and assessed as part of the NIS are shown in Table 4.9 and shown in Figure 4.7 below. Note the Preferred Approach graphic shows reference to required upgrades for WTPs in Ballylanders and Inchinleamy. These WTPs are outside the South West Region, however, upgrades are required to facilate transfers to Labbamollogga and Kilmurray respectively, leading to their inclusion in the SAJ assessment. These WTP upgrades will be addressed further in the South East RWRP.

Table 4.9 - Final Preferred Approach for SAJ – Options

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAJ-291 3100SC0082 Aglish Cul Rua	-1	**Upgrade existing WTP for water quality improvements** • WRZ not in deficit, WTP upgrade works only • WRZ current WAFU DYCP 2044 = 0.396Ml/d, DYCP 2044 demand = 0.183Ml/d so surplus of 0.213Ml/d • Existing GW abstraction maintained • Existing GW source (Tallow GWB) WFD status 2016-2021 – Good
SAJ-518 **(Part of Grouped Option SAJ-630)** 0500SC0113 Allow Regional	-3	**New GW abstraction (karstic) and new WTP to supply full deficit. Decommission Freemount WTP** • New GW abstraction to meet WRZ future deficit • WRZ current WAFU DYCP 2044 = 2.383Ml/d, DYCP 2044 demand = 3.268Ml/d so additional 0.885Ml/d required to meet WRZ deficit • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good
SAJ-408 **(Part of Grouped Option SAJ-597)** 0500SC0065 Ballinamona	-2	**Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow** • Increase GW abstraction karst aquifer • Ballinanoma WRZ not in deficit but is to be rationalised to Mallow WRZ • Ballinamona WRZ current WAFU DYCP 2044 = 0.011Ml/d, DYCP 2044 demand = 0.006Ml/d so surplus of 0.005Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good
SAJ-154 and SAJ-155 **(Part of Grouped Option SAJ-520)** 0500SC0185 Ballyclough & Mount North	-1	**Increase GW abstraction from Mount North (spring) and upgrade Mountnorth WTP to supply spare capacity to neighboring WRZ. Increase GW abstraction from Mountnorth & Ballyclough (spring) and upgrade Ballyclough WTP to supply spare capacity to neighboring WRZ** • Ballyclough & Mount North WRZ in projected surplus • Ballyclough & Mount North WRZ current WAFU DYCP 2044 = 2.066Ml/d, DYCP 2044 demand = 2.014Ml/d so surplus of 0.052Ml/d • Existing GW abstraction maintained • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good
SAJ-457	-2	**Rationalise Clashmore/Whitewell to Grallagh WRZ**

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
(Part of Grouped Option SAJ-611) **3100SC0084** Clashmore / Whitewell		• Clashmore/Whitewell WRZ in deficit and is to be rationalised to Grallagh WRZ • Clashmore/Whitewell WRZ current WAFU DYCP 2044 = 0.136Ml/d, DYCP 2044 demand = 0.299Ml/d so additional 0.092Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-456 **(Part of Grouped Option SAJ-611)** 3100SC0128 Ballycurrane	-2	**Rationalise WTPs to Grallagh WRZ** • Ballycurrane WRZ in projected surplus but is to be rationalised to Grallagh WRZ • Ballycurrane WRZ current WAFU DYCP 2044 = 0.052Ml/d, DYCP 2044 demand = 0.032Ml/d so surplus of 0.02Ml/d. • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-520 **(Part of Grouped Option SAJ-631)** 0500SC0093 Ballydesmond/Kiskeam	-3	**Rationalise Ballydesmond and Kiskeam to Newmarket WRZ** • Ballydesmond WRZ in deficit and is to be rationalised to Newmarket WRZ • Ballydesmond WRZ current WAFU DYCP 2044 = 0.156Ml/d, DYCP 2044 demand = 0.171Ml/d so additional 0.015Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW sources (Rathmore West GWB) WFD status 2016-2021 – Good
SAJ-325 **(Part of Grouped Option SAJ-531)** 3100SC0052 Ballyheaphy	-2	**Increase GW abstraction from Ballyheaphy BH and upgrade Ballyheaphy WTP to supply spare capacity to neighboring scheme** • Ballyheaphy WRZ in projected surplus • Increase existing GW abstraction to meet WRZ future deficit • Ballyheaphy WRZ current WAFU DYCP 2044 = 0.046Ml/d, DYCP 2044 demand = 0.035Ml/d so surplus of 0.011Ml/d • Existing GW abstraction to be maintained • Existing GW sources (Knockmealdown GWB) WFD status 2016-2021 – Good
SAJ-511 and SAJ-512 **(Part of Grouped Option SAJ-627)** 0500SC0118 Ballyhooly	-2	**Increase GW abstraction at Downing Bridge BH and upgrade existing Dowing Bridge WTP to supply deficit. Increase GW abstraction from existing Spring and upgrade Castletownroche (Ballyhooley) WTP to supply deficit** • Ballyhooly WRZ in deficit. Increase GW abstraction to meet WRZ future deficit • Ballyhooly WRZ current WAFU DYCP 2044 = 2.888Ml/d, DYCP 2044 demand = 4.067Ml/d so additional 1.179Ml/d required to meet WRZ deficit

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
		• Existing GW abstractions maintained • Existing GW sources (Mitchelstown GWB) WFD status 2016-2021 – Good and (Rathmore West GWB) WFD status 2016-2021 – Good
SAJ-451 **(Part of Grouped Option SAJ-609)** 3100SC0121 Ballymoate Upper	-2	**Rationalise Ballymoate Upper to Tallow WRZ** • Ballymoate Upper WRZ in deficit and is to be rationalised to Tallow WRZ • Ballymoate Upper WRZ current WAFU DYCP 2044 = 0.033Ml/d, DYCP 2044 demand = 0.05Ml/d so additional 0.016Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-223 0500SC0004 Ballynoe	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Ballynoe WRZ not in deficit. WTP upgrade works only • Ballynoe WRZ current WAFU DYCP 2044 = 0.255Ml/d, DYCP 2044 demand = 0.181Ml/d so surplus of 0.074Ml/d • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-397 **(Part of Grouped Option SAJ-595)** 0500SC0122 Ballyvadonna	-2	**Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ** • Ballyvadonna WRZ in deficit and is to be rationalised to Fermoy WRZ • Ballyvadonna WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.013Ml/d so additional 0.004Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-521 **(Part of Grouped Option SAJ-631)** 0500SC0136 Banteer	-3	**Interconnect Banteer with Newmarket for increased resilience and supply deficit. Rationalise Creggane WTP - rationalisation within WRZ** • Banteer WRZ in deficit and to be interconnected with Newmarket WRZ • Banteer WRZ current WAFU DYCP 2044 = 0.73Ml/d, DYCP 2044 demand = 1.151Ml/d so additional 0.421Ml/d required to meet WRZ deficit • Existing GW abstractions maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAJ-278 **(Part of Grouped Option SAJ-520)** 0500SC0096 Boherascrub	-1	**Rationalise Boherascrub to Ballyclough & Mount North WRZ** • Boherascrub WRZ is not in deficit but would be rationalised to Mount North • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good
SAJ-411 **(Part of Grouped Option SAJ-597)** 0500SC0006 Bottlehill	-2	**Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow** • Bottlehill WRZ in deficit and is to be rationalised to Mallow WRZ • Boherascrub WRZ current WAFU DYCP 2044 = 0.038Ml/d, DYCP 2044 demand = 0.041Ml/d so an additional 0.003Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-466 **(Part of Grouped Option SAJ-616)** 0500SC0056 Bweeng	-1	**Rationalise Bweeng to Donoughmore WRZ (SAI) (TG2-SAI-212)** • Bweeng WRZ in deficit and is to be rationalised to Donoughmore WRZ • Bweeng WRZ current WAFU DYCP 2044 = 0.142Ml/d, DYCP 2044 demand = 0.373Ml/d so an additional 0.231Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-295 3100SC0017 Camphire	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Camphire WRZ in projected surplus. WTP upgrade works only • Camphire WRZ current WAFU DYCP 2044 = 0.156Ml/d, DYCP 2044 demand = 0.028Ml/d so surplus of 0.128Ml/d • Existing GW abstraction maintained • Existing GW source (Tallow GWB) WFD status 2016-2021 – Good
SAJ-272 0500SC0061 Carrigcleena	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Carrigcleena WRZ in projected surplus. WTP upgrade works only • Carrigcleena WRZ current WAFU DYCP 2044 = 0.017Ml/d, DYCP 2044 demand = 0.011Ml/d so surplus of 0.005Ml/d • Existing GW abstraction maintained

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
		• Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-287 1900SC0018 Castletown/Ballyagran Water Supply	0	**Increase GW abstraction at Ballyagran BH and upgrade Ballyagran Pump Station WTP to supply deficit** • Castletown Ballyagran WRZ in deficit • Castletown Ballyagran WRZ current WAFU DYCP 2044 = 0.19Ml/d, DYCP 2044 demand = 1.189Ml/d so an additional 0.999Ml/d required to meet WRZ deficit • Increase existing GW abstraction to meet WRZ future deficit • Existing GW source (Bruree GWB) WFD status 2016-2021 – Good
SAJ-128 0500SC0124 Castletownroche	-2	**Conjunctive use of existing spring and trial well and upgrade existing Castletownroche WTP** • Castletownroche WRZ in deficit • Castletownroche WRZ current WAFU DYCP 2044 = 0.99Ml/d, DYCP 2044 demand = 1.477Ml/d so an additional 0.487Ml/d required to meet WRZ deficit • Increase existing GW abstraction to meet WRZ future deficit • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good
SAJ-516 **(Part of Grouped Option SAJ-629)** 0500SC0110 Castlewrixon	-3	**Rationalise Castlewrixon, Monabricka and Skahanagh WRZs to Charleville/Doneraile WRZ** • Castlewrixon WRZ in projected surplus but is to be rationalised to Charlevile/Doneraile WRZ • Castlewrixon WRZ current WAFU DYCP 2044 = 0.011Ml/d, DYCP 2044 demand = 0.006Ml/d so surplus of 0.005Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Ballyhoura GWB) WFD status 2016-2021 – Good
SAJ-515 **(Part of Grouped Option SAJ-629)** 0500SC0114 Charleville / Doneraile	-3	**New GW and upgrade Charleville WRZ to supply deficit** • Charleville/Doneraile WRZ in deficit • New GW abstraction to meet WRZ future deficit • Charleville/Doneraile WRZ current WAFU DYCP 2044 = 9.319Ml/d, DYCP 2044 demand = 13.923Ml/d so an additional 4.604Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good • New GW sources; BH2 & BH5 (Mitchelstown GWB) WFD status 2016-2021 – Good, BH1 (Ballyhoura Kiltorcan GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAJ-141 0500SC0002 Conna Regional	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Conna Regional WRZ in projected surplus • 4no. WTPs upgrade works only • Conna Regional WRZ current WAFU DYCP 2044 = 2.966Ml/d, DYCP 2044 demand = 2.067Ml/d so surplus of 0.899Ml/d • Existing GW and SW abstractions maintained • Existing SW source (River Bride SWB) WFD status 2016-2021 – Good • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-400 **(Part of Grouped Option SAJ-595)** 0500SC0089 Coolagown	-2	**Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ** • Coolagown WRZ in deficit but is to be rationalised to Fermoy WRZ • Coolagown WRZ current WAFU DYCP 2044 = 0.041Ml/d, DYCP 2044 demand = 0.052Ml/d so an additional 0.011Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-188 0500SC0126 Dromahane / Kilcolman / Cois Tobair	-1	**Upgrade existing WTPs for water quality improvements. The WRZ is not in deficit** • Dromahane / Kilcolman / Cois Tobair WRZ in projected surplus • WTPs upgrade works only • Dromahane / Kilcolman / Cois Tobair WRZ current WAFU DYCP 2044 = 0.722Ml/d, DYCP 2044 demand = 0.579Ml/d so an additional 0.143Ml/d required to meet WRZ deficit • Existing GW abstractions maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-396 **(Part of Grouped Option SAJ-595)** 0500SC0176 Fermoy	-2	**Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Additional treatment is provided when the infiltration gallery floods** • Fermoy WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Fermoy WRZ current WAFU DYCP 2044 = 3.850Ml/d, DYCP 2044 demand = 5.101Ml/d so an additional 1.251Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAJ-467 **(Part of Grouped Option SAJ-617)** 0500SC0175 Glanworth / Ballykenley/Johnstown	-1	**New GW abstraction at Ballynacagheragh (no. 2 BHs - projected yield 2.2 MLD) and new WTP to supply deficit. New Storage at Dunmahon** • Glanworth / Ballykenley / Johnstown WRZ in deficit • New GW abstraction to meet WRZ future deficit • Glanworth / Ballykenley / Johnstown WRZ current WAFU DYCP 2044 = 2.2920Ml/d, DYCP 2044 demand = 3.421Ml/d so an additional 1.13Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW sources (Cappoquin Kiltorcan GWB) WFD status 2016-2021 – Good and (Mitchelstown GWB) WFD status 2016-2021 – Good • New GW source (Cappoquin Kiltorcan GWB) WFD status 2016-2021 – Good
SAJ-426 **(Part of Grouped Option SAJ-601)** 0500SC0099 Glenduff	-1	**Rationalise Glenduff to Mitchelstown (planned for 2022)** • Glenduff WRZ in project surplus but is to be rationalised to Mitchelstown WRZ • Glenduff WRZ current WAFU DYCP 2044 = 0.011Ml/d, DYCP 2044 demand = 0.008Ml/d so a surplus of 0.003Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good
SAJ-522 **(Part of Grouped Option SAJ-631)** 0500SC0076 Glenleigh	-3	**Rationalise Glenleigh and Kilcorney to Millstreet WRZ** • Glenleigh WRZ is in projected surplus but is to be rationalised to Millstreet WRZ • Glenleigh WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.005Ml/d so surplus of 0.004Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-407 **(Part of Grouped Option SAJ-597)** 0500SC0182 Gortnagreige	-2	**Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow** • Ballinanoma WRZ in deficit and is to be rationalised to Mallow WRZ • Ballinamona WRZ current WAFU DYCP 2044 = 0.202Ml/d, DYCP 2044 demand = 0.272Ml/d so an additional 0.07Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAJ-260 **(Part of Grouped Option SAJ-531)** 0500SC0102 Gortnaskehy	-2	**Rationalise Gortnaskehy to Ballyheaphy WRZ** • Gortnaskehy WRZ in projected surplus but is to be rationalised to Ballyheaphy WRZ • Gortnaskehy WRZ current WAFU DYCP 2044 = 0.028Ml/d, DYCP 2044 demand = 0.025Ml/d so surplus of 0.003Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Araglin GWB) WFD status 2016-2021 – Good
SAJ-455 **(Part of Grouped Option SAJ-611)** 3100SC0007 Grallagh	-2	**Increase GW abstraction from Grallagh BH and upgrade Grallagh WTP to supply deficit** • Grallagh WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Grallagh WRZ current WAFU DYCP 2044 = 0.068Ml/d, DYCP 2044 demand = 0.108Ml/d so an additional 0.04Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-519 **(Part of Grouped Option SAJ-630)** 0500SC0144 Kilbrin Garran an Darra	-3	**Rationalise Kilbrin Garran an Darra to Allow Regional WRZ** • Kilbrin Garran an Darra WRZ is in projected surplus but is to be rationalised to Allow Regional WRZ • Kilbrin Garran an Darra WRZ current WAFU DYCP 2044 = 0.085Ml/d, DYCP 2044 demand = 0.026Ml/d so surplus of 0.059Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Rathmore West GWB) WFD status 2016-2021 – Good
SAJ-523 **(Part of Grouped Option SAJ-631)** 0500SC0075 Kilcorney	-3	**Rationalise Glenleigh and Kilcorney to Millstreet WRZ** • Kilcorney WRZ in projected surplus but is to be rationalised to Millstreet WRZ • Kilcorney WRZ current WAFU DYCP 2044 = 0.075Ml/d, DYCP 2044 demand = 0.066Ml/d so surplus of 0.009Ml/d • Existing GW abstraction to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-412 **(Part of Grouped Option SAJ-597)** 0500SC0128	-2	**Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow** • Killavullen WRZ in deficit and is to be rationalised to Mallow WRZ • Killavullen WRZ current WAFU DYCP 2044 = 0.642Ml/d, DYCP 2044 demand = 0.722Ml/d so an additional 0.081Ml/d required to meet WRZ deficit

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
Killavullen		• Existing GW abstraction and WTP to be decommissioned • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good
SAJ-401 **(Part of Grouped Option SAJ-595)** 0500SC0090 Kilmagnier	-2	**Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ** • Kilmagnier WRZ in deficit and is to be rationalised to Fermoy WRZ • Kilmagnier WRZ current WAFU DYCP 2044 = 0.101Ml/d, DYCP 2044 demand = 0.137Ml/d so additional 0.036Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-450 **(Part of Grouped Option SAJ-609)** 3100SC0106 Kilmore-Kilbeg	-2	**Rationalise Kilmore-Kilbeg to Tallow WRZ** • Kilmore-Kilbeg WRZ is in projected surplus but is to be rationalised to Tallow WRZ • Kilmore-Kilbeg WRZ current WAFU DYCP 2044 = 0.031Ml/d, DYCP 2044 demand = 0.015Ml/d so in surplus of 0.016Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-462 **(Part of Grouped Option SAJ-614)** 0500SC0092 Kilmurry (Mitchelstown)	-2	**Rationalise Kilmurry (Mitchelstown) to Inchinleamy (SA K Waterford) WRZ. This WRZ is not in deficit and spare capacity can cover the demand in Kilmurry (Mitchelstown)** • Kilmurry (Mitchelstown) WRZ in deficit and is to be rationalised to Inchinleamy WRZ • Kilmurry (Mitchelstown) WRZ current WAFU DYCP 2044 = 0.048Ml/d, DYCP 2044 demand = 0.037Ml/d so an additional 0.011Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW source (Knockmealdown GWB) WFD status 2016-2021 – Good
SAJ-524 **(Part of Grouped Option SAJ-631)** 0500SC0094 Kiskeam	-3	**Rationalise Ballydesmond and Kiskeam to Newmarket WRZ** • Kiskeam WRZ in deficit and is to be rationalised to Newmarket WRZ • Kilbrin Garran an Darra WRZ current WAFU DYCP 2044 = 0Ml/d, DYCP 2044 demand = 0.094Ml/d so an additional 0.094Ml/d required to meet WRZ deficit • Existing GW abstraction to be decommissioned • Existing GW source (Rathmore West GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAJ-468 **(Part of Grouped Option SAJ-617)** 0500SC0103 Knockanevin	-1	**Rationalise Knockanevin to Glanworth/Ballykenley/Johnstown (WRZ)** • Knockanevin WRZ in deficit and is to be rationalised to Glanworth / Ballykenley / Johnstown WRZ • Knockanevin WRZ current WAFU DYCP 2044 = 0.018Ml/d, DYCP 2044 demand = 0.022Ml/d so an additional 0.004Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Ballyhoura GWB) WFD status 2016-2021 – Good
SAJ-399 **(Part of Grouped Option SAJ-595)** 0500SC0088 Knockdrumaclough	-2	**Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ** • Knockdrumaclough WRZ in project surplus but is to be rationalised to Fermoy WRZ • Knockdrumaclough WRZ current WAFU DYCP 2044 = 0.083Ml/d, DYCP 2044 demand = 0.033Ml/d so a surplus of 0.049Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-262 0500SC0105 Knockeragh	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Knockeragh WRZ in project surplus so WTP upgrade works only • Knockeragh WRZ current WAFU DYCP 2044 = 0.018Ml/d, DYCP 2044 demand = 0.018Ml/d, not in deficit • Existing GW abstraction maintained • Existing GW source (Rathmore West GWB) WFD status 2016-2021 – Good
SAJ-413 **(Part of Grouped Option SAJ-597)** 0500SC0166 Knoppogue	-2	**Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow** • Knoppogue WRZ in project surplus but is to be rationalised to Mallow WRZ • Knoppogue WRZ current WAFU DYCP 2044 = 0.046Ml/d, DYCP 2044 demand = 0.013Ml/d so a surplus of 0.033Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-461 **(Part of Grouped Option SAJ-613)** 0500SC0106 Labbamollogga	-1	**Rationalise Labbamollogga to Ballylanders WRZs (Study Area K)** • Labbamollogga WRZ in deficit and is to be rationalised to Ballylanders WRZ • Labbamollogga WRZ current WAFU DYCP 2044 = 0.015Ml/d, DYCP 2044 demand = 0.016Ml/d so an additional 0.001Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Ballyhoura GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
		• The infrastructure associated within this option falls within both SAJ and SAK (in the South East Region), but the option has been included in the SAJ assessment
SAJ-162 0500SC0130 Lombardstown Glantane	-1	**Increase GW abstraction from Kilgobnet (Spring) and upgrade Laharan Abbeys Well WTP to supply deficit** • Lombardstown Glantane WRZ in deficit • Increase existing GW abstraction and WTP upgrade to meet WRZ future deficit • Lombardstown Glantane WRZ current WAFU DYCP 2044 = 0.44Ml/d, DYCP 2044 demand = 0.486Ml/d so an additional 0.046Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-167 0500SC0066 Lyre	-1	**Increase GW abstraction from Lyre spring and upgrade Lyre WTP to supply deficit** • Lyre WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Lyre WRZ current WAFU DYCP 2044 = 0.101Ml/d, DYCP 2044 demand = 0.21Ml/d so an additional 0.109Ml/d required to meet WRZ deficit • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-513 **(Part of Grouped Option SAJ-627)** 0500SC0121 Macroney	-2	**Rationalise Macroney to Ballyhooly WRZ (Downing Bridge WTP)** • Castlecooke/Macroney WRZ in deficit and is to be rationalise to Ballyhooly WRZ • Castlecooke/Macroney WRZ current WAFU DYCP 2044 = 0.083Ml/d, DYCP 2044 demand = 0.096Ml/d so additional 0.014Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Cappoquin Kiltorcan GWB) WFD status 2016-2021 – Good
SAJ-406 **(Part of Grouped Option SAJ-597)** 0500SC0131 Mallow	-2	**Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit** • Mallow WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Mallow WRZ current WAFU DYCP 2044 = 7.333Ml/d, DYCP 2044 demand = 10.418Ml/d so an additional 3.084Ml/d required to meet the WRZ deficit • Existing GW abstraction maintained • Existing GW sources (Glenville GWB) WFD status 2016-2021 – Good and (Mitchelstown GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAJ-525 **(Part of Grouped Option SAJ-631)** 0500SC0138 Millstreet	-3	**Interconnect Millstreet with Newmarket for increased resilience and supply deficit. Rationalise Cockhill WTP and Caherbarnagh WTP - rationalisation within WRZ** • Millstreet WRZ in deficit but is to be interconnected to Newmarket WRZ • Millstreet WRZ current WAFU DYCP 2044 = 2.177Ml/d, DYCP 2044 demand = 3.795Ml/d so an additional 1.617Ml/d required to meet WRZ deficit • Existing GW abstraction to be maintained • Existing GW sources (Glenville GWB) WFD status 2016-2021 – Good and (Rathmore West GWB) WFD status 2016-2021 – Good
SAJ-425 **(Part of Grouped Option SAJ-601)** 0500SC0100 Mitchelstown	-1	**Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs** • Mitchelstown WRZ in deficit • Increase existing GW abstraction to meet WRZ future deficit • Mitchelstown WRZ current WAFU DYCP 2044 = 2.66Ml/d, DYCP 2044 demand = 4.392Ml/d so an additional 1.732Ml/d required to meet WRZ deficit • Existing GW abstractions maintained • Existing GW sources (Ballyhoura GWB) WFD status 2016-2021 – Good and (Knockmealdown GWB) WFD status 2016-2021 – Good
SAJ-514 **(Part of Grouped Option SAJ-628)** 0500SC0107 Monabricka	-1	**Rationalise Monabricka to South West Regional Scheme WRZ** • Monabricka WRZ in deficit and is to be rationalised to South West Regional Scheme WRZ • Monabricka WRZ current WAFU DYCP 2044 = 0.028Ml/d, DYCP 2044 demand = 0.069Ml/d so an additional 0.039Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned
SAJ-409 **(Part of Grouped Option SAJ-597)** 0500SC0062 Monaparson	-2	**Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow** • Monaparson WRZ in projected surplus but is to be rationalised to Mallow WRZ • Monaparson WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.008Ml/d so surplus of 0.001Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAJ-414 **(Part of Grouped Option SAJ-597)** 0500SC0064 Monee & Knockabrack	-2	**Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow** • Monee & Knockabrack WRZ in projected surplus but is to be rationalised to Mallow WRZ • Monee & Knockabrack WRZ current WAFU DYCP 2044 = 0.124Ml/d, DYCP 2044 demand = 0.094Ml/d so surplus of 0.029Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-281 0500SC0101 Mountain Barracks	-1	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Mountain Barracks WRZ in projected surplus so WTP upgrade works only • Mountain Barracks WRZ current WAFU DYCP 2044 = 0.019Ml/d, DYCP 2044 demand = 0.015Ml/d so surplus of 0.004Ml/d • Existing GW abstraction maintained • Existing GW source (Knockmealdown GWB) WFD status 2016-2021 – Good
SAJ-526 and SAJ-527 **(Part of Grouped Option SAJ-631)** 0500SC0143 Newmarket	-3	**New GW abstraction in the vicinity of Ballinatona WTP, upgrade existing Ballinatona WTP and supply deficit. New GW abstraction from Ketragh Springs and new WTP to supply deficit (karstic region)** • Newmarket WRZ in deficit • New GW abstractions to meet the WRZ future deficit • Newmarket WRZ current WAFU DYCP 2044 = 2.177Ml/d, DYCP 2044 demand = 3.795Ml/d so an additional 1.617Ml/d required to meet WRZ deficit • Existing GW abstraction to be maintained • Existing GW source (Rathmore West GWB) WFD status 2016-2021 – Good • New GW sources (Mitchelstown GWB) WFD status 2016-2021 – Good and (Rathmore West GWB) WFD status 2016-2021 – Good
SAJ-424 **(Part of Grouped Option SAJ-600)** 0500SC0108 Rockchapel	-2	**Rationalise Stagmount to Rockchapel WRZ (planned for 2022). Supply spare capacity** • Rockchapel WRZ in projected surplus • Rockchapel WRZ current WAFU DYCP 2044 = 0.138Ml/d, DYCP 2044 demand = 0.055Ml/d so surplus of 0.083Ml/d • Existing GW abstraction to be maintained • Existing GW source (Abbeyfeale GWB) WFD status 2016-2021 – Good

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
SAJ-517 **(Part of Grouped Option SAJ-629)** 0500SC0104 Skahanagh	-3	**Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ** • Skahanagh WRZ in deficit and is to be rationalised to Charleville/Doneraile WRZ • Skahanagh WRZ current WAFU DYCP 2044 = 0.023Ml/d, DYCP 2044 demand = 0.038Ml/d so an additional 0.015Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Mitchelstown GWB) WFD status 2016-2021 – Good
SAJ-423 **(Part of Grouped Option SAJ-600)** 0500SC0109 Stagmount	-2	**Rationalise Stagmount to Rockchapel WRZ (planned for 2022)** • Stagmount WRZ in projected surplus but is to be rationalised to Rockchapel WRZ • Stagmount WRZ current WAFU DYCP 2044 = 0.009Ml/d, DYCP 2044 demand = 0.005Ml/d so surplus of 0.004Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Abbeyfeale GWB) WFD status 2016-2021 – Good
SAJ-304 3100SC0010 Strancally	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Strancally WRZ in project surplus so WTP upgrade works only • Strancally WRZ current WAFU DYCP 2044 = 0.064Ml/d, DYCP 2044 demand = 0.024Ml/d so a surplus of 0.041Ml/d • Existing GW abstraction maintained • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-398 **(Part of Grouped Option SAJ-595)** 0500SC0165 Strawhall	-2	**Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ** • Knockdrumaclough WRZ in project surplus but is to be rationalised to Fermoy WRZ • Knockdrumaclough WRZ current WAFU DYCP 2044 = 0.028Ml/d, DYCP 2044 demand = 0.009Ml/d so a surplus of 0.018Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-449 **(Part of Grouped Option SAJ-609)** 3100SC0020 Tallow	-2	**New GW abstraction in karstic region and new WTP to supply full demand** • Tallow WRZ in deficit • New GW abstraction and new WTP to meet the WRZ future deficit • Tallow WRZ current WAFU DYCP 2044 = 0.275Ml/d, DYCP 2044 demand = 0.416Ml/d so additional 0.141Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned

WRZ Name and Option Reference	Fine Screening score (European sites question only)	Option Description
		• Existing GW source (Glenville GWB) WFD status 2016-2021 – Good • New GW source (Tallow GWB) WFD status 2016-2021 – Good
SAJ-458 **(Part of Grouped Option SAJ-611)** 3100SC0008 Tinkock/Tinnabinna	-2	**Rationalise Tiknock/Tinnabina to Grallagh WRZ** • Tiknock/Tinnabina WRZ in deficit and is to be rationalised to Grallagh WRZ • Tiknock/Tinnabina WRZ current WAFU DYCP 2044 = 0.023Ml/d, DYCP 2044 demand = 0.037Ml/d so an additional 0.014Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-528 **(Part of Grouped Option SAJ-631)** 0500SC0139 Toureen Derry	-3	**Rationalise Toureen Derry to Banteer WRZ (approved)** • Toureen Derry WRZ in deficit and is to be rationalised to Banteer WRZ • Toureen Derry WRZ current WAFU DYCP 2044 = 0.069Ml/d, DYCP 2044 demand = 0.165Ml/d so an additional 0.096Ml/d required to meet WRZ deficit • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good
SAJ-294 3100SC0016 Villierstown	0	**Upgrade existing WTP for water quality improvements. The WRZ is not in deficit** • Villierstown WRZ in projected so WTP upgrade works only • Villierstown WRZ current WAFU DYCP 2044 = 0.295Ml/d, DYCP 2044 demand = 0.123Ml/d so surplus of 0.172Ml/d • Existing GW abstraction maintained • Existing GW source (Tallow GWB) WFD status 2016-2021 – Good
SAJ-415 **(Part of Grouped Option SAJ-597)** 0500SC0186 Rahan	-2	**Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow** • Rahan WRZ in projected surplus but is to be rationalised to Mallow WRZ • Rahan WRZ current WAFU DYCP 2044 = 0.145Ml/d, DYCP 2044 demand = 0.133Ml/d so surplus of 0.012Ml/d • Existing GW abstraction and WTP to be decommissioned • Existing GW source (Glenville GWB) WFD status 2016-2021 – Good

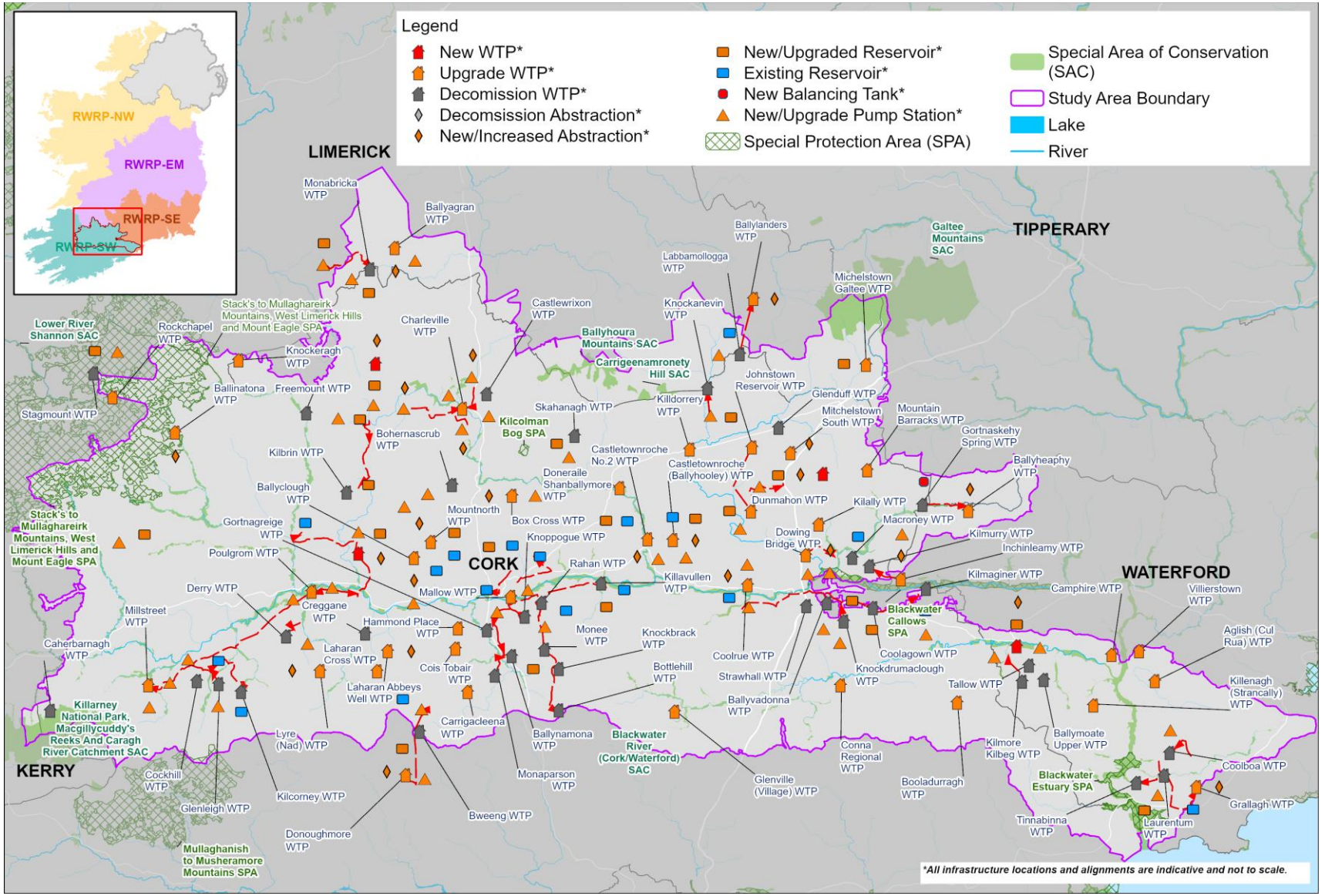

Figure 4.7 - Study Area J – Preferred Approach and European sites

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-SW

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 entrapment/entrainment of fish on/in screens (during the abstraction process). • 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

[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)*
	deposition of shingle or other material potentially impacting on QI fish species amongst others. • Changes in these processes can impact aquatic/riparian/terrestrial habitats and species either directly or indirectly.
Water table/availability *(Operation-related)*	• Changes to water levels and flows due to water abstraction from ground or surface 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-SW is provided in Appendix A. The RWRP-SW 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-SW is on the South West 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-SW have been considered for their potential for LSE as part of this NIS for the RWRP-SW (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 West region (Study Areas H-J), 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-SW 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 H

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

Table 6.1.1 – SAH Preferred Approaches subject to AA

WRZ Name and Option Reference	Option Description
SAH-162 **(Part of Grouped Option SAH-524)** 1900SC0021 Abbeyfeale Water Supply	New GW abstraction and interconnect Abbeyfeele and Listowel Regional WRZs (approx. distance 1km, new watermains and network upgrades required) for increased resilience and supply deficit
SAH-108 **(Part of Grouped Option SAH-512)** 1300SC0008 An Clochan	Increase GW abstraction at An Clochan. Ce Brennan and Clochan are connected - Could feed from either depending on where yield is.
SAH-122 1300SC0007 An Fheothanach/ An Mhuirioch/ Baile Breach	Amalgamate all sources in WRZ to one WTP and rationalise smaller WTP - Upgrade an Fheothanach WTP
SAH-173 1300SC0002 Annascaul / Ballintermon	WTP Upgrade - No deficit
SAH-038 1300SC0010 Ardfert North/ Glenderry Ballyheigue WRZ	Increase Ballyheigue GW abstraction. Abandon existing borehole (BH) at Glenderry Well and rationalise WTP
SAH-138 1300SC0030 Aughacasla	New GW abstraction from Aughacasla BHs and upgrade existing Aughacasla WTP to supply deficit. Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones
SAH-187 **(Part of Grouped Option SAH-533)** 1300SC0005	Increase GW abstraction from Tobar Bhreandáin WTP BH (local important aquifer) and upgrade Tobar Bhreandáin WTP

WRZ Name and Option Reference	Option Description
Baile An Fheirtearaigh / Tir Abhainn Thoir / Cill Maoilcheadair / An Ghraig/Cloichear	
SAH-225 1300SC0012 Brosna/Knocknagoshel PWSS 016F	New GW abstraction. Develop trial well (TW) at Brosna raw water pump house
SAH-182 **(Part of Grouped Option SAH-531)** 1300SC0032 Cahersiveen	Rationalise Cahersiveen to Waterville, with Lough Currane abstraction increased to meet deficit
SAH-065 1300SC0009 Castlegregory PWSS 024D	New SW abstraction from Lough Gill and upgrade Castlegregory WTP
SAH-108a **(Part of Grouped Option SAH-512)** 1300SC0028 Ce Bhreannain	Increase GW abstraction at An Clochan. Ce Brennan and Clochan are connected - Could feed from either depending on where yield is
SAH-177 **(Part of Grouped Option SAH-530)** 1300SC0013 Central Regional - Lough Guitane	New SW abstraction from the lower Leane catchment and WTP at abstraction to feed deficit in Central Regional and Mid Kerry (for the purposes of the assessment, the entire lower Leane catchment is considered to be within the Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC)
SAH-186 **(Part of Grouped Option SAH-533)** 1300SC0006 Dun Chaoin PWS 034D	Increase GW abstraction from Tobar Bhreandáin WTP BH and supply Dun Chaoin
SAH-204 **(Part of Grouped Option SAH-531)** 1300SC0016 Emlaghpeasta / Portmagee / Maulin	Rationalise Emlaghpeasta to Waterville, with Lough Currane abstraction increased to meet deficit
SAH-162a **(Part of Grouped Option SAH-524)** 1300SC0011 Listowel Regional PWS	New GW abstraction and interconnect Abbeyfeale and Listowel
SAH-148 1300SC0024 Lyranes 303A	Increase GW abstraction from source Lyranes BH (local important aquifer) and upgrade Lyranes WTP
SAH-178 **(Part of Grouped Option SAH-530)** 1300SC0015	New SW abstraction from the lower Leane catchment and WTP at abstraction to feed deficit in Central Regional and Mid Kerry (for the purposes of the assessment, the entire lower Leane catchment is considered to be within the

WRZ Name and Option Reference	Option Description
Mid Kerry	Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC)
SAH-170 1300SC0025 Mountain Stage PWS 062A	New abstraction from Coomassaharn Lake, upgrade Mountain Stage WTP to treat
SAH-215 **(Part of Grouped Option SAH-540)** 1300SC0031 Rathmore	Rationalise Rathmore WTP and connect to Central Regional WRZ. Note: the new SW abstraction from the lower Leane catchment included in this option is the same new SW abstraction included in SAH-530, and so there is only one abstraction associated with option SAH-530 and SAH-540 (for the purposes of the assessment, the entire lower Leane catchment is considered to be within the Killarney National Park, Macgillycuddy's Reeks And Caragh River Catchment SAC)
SAH-181 **(Part of Grouped Option SAH-531)** 1300SC0023 Waterville (SAI)	Increase abstraction from Lough Currane and supply Cahersiveen and Emlaghpeasta

6.1.2 Study Area I

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

Table 6.1.2- SAI Preferred Approaches subject to AA

WRZ Name and Option Reference	Option Description
SAI-957 **(Part of Grouped Option SAI-971)** 0500SC0145 Bandon Regional	Interconnect with Cork City via Inniscarra
SAI-011 0500SC0070 Ballymakeera	New SW abstraction from River Sullane and upgrade Ballymakeera WTP
SAI-942 **(Part of Grouped Option SAI-971)** 0500SC0059 Aghabulloge	Rationalise to Cork City WRZ
SAI-954 **(Part of Grouped Option SAI-971)** 0500SC0073 Ballinagree	Rationalise to Cork City WRZ
SAI-955 **(Part of Grouped Option SAI-971)**	Rationalise to Cork City WRZ

WRZ Name and Option Reference	Option Description
0500SC0074 Rylane	
SAI-960 **(Part of Grouped Option SAI-971)** 0500SC0146 Clashanamid	Rationalise Clashanamid to Cork City WRZ (Innishannon WTP)
SAI-940 **(Part of Grouped Option SAI-971)** 0500SC0171 Knockburden	Rationalise Knockburden to Cork City WRZ (Inniscarra WTP) via Cloughduv
SAI-951 **(Part of Grouped Option SAI-971)** 0500SC0020 Cullen	Rationalise Cullen to Cork City WRZ (Inniscarra WTP)
SAI-943 **(Part of Grouped Option SAI-971)** 0500SC0058 Coolineagh	Rationalise to Cork City WRZ
SAI-959 **(Part of Grouped Option SAI-971)** 0500SC0161 Tibbotstown	Rationalise Tibbotstown to Cork City WRZ (Inniscarra WTP)
SAI-949 **(Part of Grouped Option SAI-971)** 0500SC0055 Grenagh	Rationalise Grenagh WRZ and Cork City WRZ (Inniscarra WTP) via Blarney
SAI-944 **(Part of Grouped Option SAI-971)** 0500SC0047 Corbally	Rationalise Corbally to Inniscarra WTP
SAI-945 **(Part of Grouped Option SAI-971)** 0500SC0048 Clash Leamleara	Rationalise Clash Leamleara to Inniscarra WTP via Corbally
SAI-952 **(Part of Grouped Option SAI-971)** 0500SC0172 Ballyshoneen	Rationalise Ballyshoneen and Vicarstown to Inniscarra WTP

WRZ Name and Option Reference	Option Description
SAI-946 **(Part of Grouped Option SAI-971)** 0500SC0167 Ballincurrig Lisgoold	Rationalise Ballincurrig Lisgoold WRZ to Inniscarra WTP
SAI-947 **(Part of Grouped Option SAI-971)** 0500SC0046 Walshtown	Rationalise Walshtown to Inniscarra WTP
SAI-950 **(Part of Grouped Option SAI-971)** 0500SC0053 Stoneview Blarney	Rationalise Stoneview to Cork City WRZ (Inniscarra WTP)
SAI-939 **(Part of Grouped Option SAI-971)** 0500SC0082 Cork City	Increase abstraction at Inniscarra
SAI-958 **(Part of Grouped Option SAI-971)** 0500SC0153 Clonakilty	Interconnect with Cork City via Inniscarra
SAI-953 **(Part of Grouped Option SAI-971)** 0500SC0054 Vicarstown	Rationalise Ballyshoneen and Vicarstown to Inniscarra WTP
SAI-941 **(Part of Grouped Option SAI-971)** 0500SC0081 Templemartin & Garranes	Rationalise Templemartin & Garranes to Cork City WRZ (Inniscarra WTP)
SAI-956 **(Part of Grouped Option SAI-971)** 0500SC0152 Bayview	Rationalise to Cork City
SAI-948 **(Part of Grouped Option SAI-971)** 0500SC0159 Midleton	Maintain allowable abstraction from Owenacurra River and supply deficit from Inniscarra
SAI-060 0500SC0009	Increase SW from Bunsheelin River and upgrade WTP

WRZ Name and Option Reference	Option Description
Ballingeary	
SAI-193 0500SC0158 Cloyne	New GW abstraction (karstic region) and new WTP to supply deficit
SAI-457 0500SC0024 Goleen	Increase SW abstraction from Goleen Intake and upgrade Goleen WTP
SAI-468 0500SC0069 Crosterra	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAI-480 0500SC0036 Cahermore	New GW abstraction to supply deficit and upgrade WTP. Abandon existing SW source
SAI-498 0500SC0023 Toormore	New GW abstraction and upgrade Toormore WTP to supply deficit
SAI-630 1300SC0019 Kenmare / Kilgarvan	New SW abstraction from Kenmare River and new WTP
SAI-643 1300SC0018 Sneem PWS	Increase SW abstraction from Lough Dromtine
SAI-645 1300SC0029 Kilgarvan	New GW abstraction and new WTP
SAI-652 1300SC0027 Lauragh PWS	New SW abstraction from Glenmore Lake and upgrade WTP
SAI-660 0500SC0026 Kilcrohane	New GW abstraction and abandon existing GW source. New WTP
SAI-768 0500SC0037 Dursey Island	New raw water storage for this WRZ. Based on requiring 100 days supply of 0.013Ml/d deficit
SAI-771 0500SC0008	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit

WRZ Name and Option Reference	Option Description
Inchigeelagh	
SAI-779 0500SC0154 Lyre Clonakilty	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAI-784 0500SC0025 Crookhaven	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAI-231 **(Part of Grouped Option SAI-877)** 0500SC0162 Mogeely	Increase existing GW abstraction from infiltration gallery and supply deficit
SAI-893 **(Part of Grouped Option SAI-877)** 0500SC0044 Dungourney	Rationalise Dungourney WTP to Mogeely WRZ
SAI-399 **(Part of Grouped Option SAI-897)** 0500SC0012 Dunmanway	Interconnect Dunmanway and Drinagh WRZ. Supply deficit from Curraghlicky Lake
SAI-434 **(Part of Grouped Option SAI-897)** 0500SC0038 Drinagh	Increase SW abstraction from Curraghlicky Lake and upgrade WTP
SAI-641 **(Part of Grouped Option SAI-923)** 1300SC0017 Caherdaniel / Castlecove	Supplement Caherdaniel from Waterville
SAI-642 **(Part of Grouped Option SAI-923)** 1300SC0023 Waterville PWS 075H	Increase abstraction from Lough Currane and supply Caherdaniel
SAI-830 **(Part of Grouped Option SAI-949)** 0500SC0042 Youghal Regional	New GW abstraction (karstic) and new WTP to supply deficit
SAI-832 **(Part of Grouped Option SAI-949)**	Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal (new GW source)

WRZ Name and Option Reference	Option Description
0500SC0041 Ballymacoda	
SAI-833 **(Part of Grouped Option SAI-949)** 0500SC0040 Kilcraheen	Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal (new GW source)
SAI-831 **(Part of Grouped Option SAI-949)** 0500SC0039 Knockadoon	Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal (new GW source)
SAI-837 **(Part of Grouped Option SAI-950)** 0500SC0085 Killeagh	Increase GW abstraction (karstic) and supply deficit
SAI-836 **(Part of Grouped Option SAI-950)** 0500SC0084 Ballykilty	Rationalise Ballykilty to Killeagh WRZ
SAI-861 **(Part of Grouped Option SAI-955)** 0500SC0030 Bantry	New Inchybegga Impoundment (Cullomane) and new WTP. To supply Bantry deficit and transfer west to supply WRZs full demands
SAI-865 **(Part of Grouped Option SAI-955)** 0500SC0034 Castletownbere	Rationalise to Bantry (new Inchybegga Impoundment source)
SAI-862 **(Part of Grouped Option SAI-955)** 0500SC0068 Glengarriff	Rationalise to Bantry (new Inchybegga Impoundment source)
SAI-863 **(Part of Grouped Option SAI-955)** 0500SC0033 Adrigole	Rationalise to Bantry (new Inchybegga Impoundment source)
SAI-864 **(Part of Grouped Option SAI-955)** 0500SC0181 Reenmeen West	Rationalise to Bantry (new Inchybegga Impoundment source)

WRZ Name and Option Reference	Option Description
SAI-883 **(Part of Grouped Option SAI-960)** 0500SC0035 Allihies	Rationalise Allihies to Ballydonegan GWS
SAI-882 **(Part of Grouped Option SAI-960)** 0500SC0170 Cluain Court Allihies	Rationalise Cluain Court Allihies to Allihies
SAI-888 **(Part of Grouped Option SAI-962)** 0500SC0021 Skibbereen 2 (Baltimore and Schull)	Upgrade Lake Cross WTP and supply deficit from Skibbereen 1 WRZ
SAI-887 **(Part of Grouped Option SAI-962)** 0500SC0173 Skibbereen 1 (Ballyhilty and Drimoleague)	Upgrade Ballyhilty WTP and supply spare capacity to Skibbereen 2 - Baltimore and Schull WRZ
SAI-889 **(Part of Grouped Option SAI-963)** 0500SC0017 Nohoval	Rationalise Nohoval and Minane Bridge WRZs and supply deficit from Minane WRZ
SAI-890 **(Part of Grouped Option SAI-963)** 0500SC0083 Minane Bridge	New GW abstraction and upgrade Minane Bridge WTP
SAI-964 **(Part of Grouped Option SAI-963)** 0500SC0016 Roberts Cove	Rationalise Roberts Cove and Minane Bridge WRZs and supply deficit from Minane WRZ

6.1.3 Study Area J

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

Table 6.1.3 - SAJ Preferred Approaches subject to AA

WRZ Name and Option Reference	Option Description
SAJ-291 3100SC0082 Aglish Cul Rua	Upgrade existing WTP for water quality improvements

WRZ Name and Option Reference	Option Description
SAJ-518 **(Part of Grouped Option SAJ-630)** 0500SC0113 Allow Regional	New GW abstraction (karstic) and new WTP to supply full deficit. Decommission Freemount WTP
SAJ-408 **(Part of Grouped Option SAJ-597)** 0500SC0065 Ballinamona	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow
SAJ-154 and SAJ-155 **(Part of Grouped Option SAJ-520)** 0500SC0185 Ballyclough & Mount North	Increase GW abstraction from Mount North (spring) and upgrade Mountnorth WTP to supply spare capacity to neighboring WRZ. Increase GW abstraction from Mountnorth & Ballyclough (spring) and upgrade Ballyclough WTP to supply spare capacity to neighboring WRZ
SAJ-457 **(Part of Grouped Option SAJ-611)** 3100SC0084 Clashmore / Whitewell	Rationalise Clashmore/Whitewell to Grallagh WRZ
SAJ-456 **(Part of Grouped Option SAJ-611)** 3100SC0128 Ballycurrane	Rationalise WTPs to Grallagh WRZ
SAJ-520 **(Part of Grouped Option SAJ-631)** 0500SC0093 Ballydesmond/Kiskeam	Rationalise Ballydesmond and Kiskeam to Newmarket WRZ
SAJ-325 **(Part of Grouped Option SAJ-531)** 3100SC0052 Ballyheaphy	Increase GW abstraction from Ballyheaphy BH and upgrade Ballyheaphy WTP to supply spare capacity to neighboring scheme
SAJ-511 and SAH-512 **(Part of Grouped Option SAJ-627)** 0500SC0118 Ballyhooly	Increase GW abstraction at Downing Bridge BH and upgrade existing Dowing Bridge WTP to supply deficit. Increase GW abstraction from existing Spring and upgrade Castletownroche (Ballyhooley) WTP to supply deficit
SAJ-451 **(Part of Grouped Option SAJ-609)** 3100SC0121 Ballymoate Upper	Rationalise Ballymoate Upper to Tallow WRZ

WRZ Name and Option Reference	Option Description
SAJ-223 0500SC0004 Ballynoe	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAJ-397 **(Part of Grouped Option SAJ-595)** 0500SC0122 Ballyvadonna	Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ
SAJ-521 **(Part of Grouped Option SAJ-631)** 0500SC0136 Banteer	Interconnect Banteer with Newmarket for increased resilience and supply deficit. Rationalise Creggane WTP - rationalisation within WRZ
SAJ-278 **(Part of Grouped Option SAJ-520)** 0500SC0096 Boherascrub	Rationalise Boherascrub to Ballyclough & Mount North WRZ
SAJ-411 **(Part of Grouped Option SAJ-597)** 0500SC0006 Bottlehill	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow
SAJ-466 **(Part of Grouped Option SAJ-616)** 0500SC0056 Bweeng	Rationalise Bweeng to Donoughmore WRZ (SA I) (TG2-SAI-212)
SAJ-272 0500SC0061 Carrigcleena	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAJ-128 0500SC0124 Castletownroche	Conjunctive use of existing spring and trial well and upgrade existing Castletownroche WTP
SAJ-516 **(Part of Grouped Option SAJ-629)** 0500SC0110 Castlewrixon	Rationalise Castlewrixon, Monabricka and Skahanagh WRZs to Charleville/Doneraile WRZ
SAJ-515 **(Part of Grouped Option SAJ-629)** 0500SC0114 Charleville / Doneraile	New GW and upgrade Charleville WRZ to supply deficit

WRZ Name and Option Reference	Option Description
SAJ-400 **(Part of Grouped Option SAJ-595)** 0500SC0089 Coolagown	Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ
SAJ-188 0500SC0126 Dromahane / Kilcolman / Cois Tobair	Upgrade existing WTPs for water quality improvements. The WRZ is not in deficit
SAJ-396 **(Part of Grouped Option SAJ-595)** 0500SC0176 Fermoy	Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Additional treatment is provided when the infiltration gallery floods
SAJ-467 **(Part of Grouped Option SAJ-617)** 0500SC0175 Glanworth / Ballykenley/Johnstown	New GW abstraction at Ballynacagheragh (no. 2 BHs - projected yield 2.2 MLD) and new WTP to supply deficit. New Storage at Dunmahon
SAJ-426 **(Part of Grouped Option SAJ-601)** 0500SC0099 Glenduff	Rationalise Glenduff to Mitchelstown (planned for 2022)
SAJ-522 **(Part of Grouped Option SAJ-631)** 0500SC0076 Glenleigh	Rationalise Glenleigh and Kilcorney to Millstreet WRZ
SAJ-407 **(Part of Grouped Option SAJ-597)** 0500SC0182 Gortnagreige	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow
SAJ-260 **(Part of Grouped Option SAJ-531)** 0500SC0102 Gortnaskehy	Rationalise Gortnaskehy to Ballyheaphy WRZ
SAJ-455 **(Part of Grouped Option SAJ-611)** 3100SC0007 Grallagh	Increase GW abstraction from Grallagh BH and upgrade Grallagh WTP to supply deficit
SAJ-519 **(Part of Grouped Option SAJ-630)** 0500SC0144	Rationalise Kilbrin Garran an Darra to Allow Regional WRZ

WRZ Name and Option Reference	Option Description
Kilbrin Garran an Darra	
SAJ-523 **(Part of Grouped Option SAJ-631)** 0500SC0075 Kilcorney	Rationalise Glenleigh and Kilcorney to Millstreet WRZ
SAJ-412 **(Part of Grouped Option SAJ-597)** 0500SC0128 Killavullen	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow
SAJ-401 **(Part of Grouped Option SAJ-595)** 0500SC0090 Kilmagnier	Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ
SAJ-450 **(Part of Grouped Option SAJ-609)** 3100SC0106 Kilmore-Kilbeg	Rationalise Kilmore-Kilbeg to Tallow WRZ
SAJ-462 **(Part of Grouped Option SAJ-614)** 0500SC0092 Kilmurry (Mitchelstown)	Rationalise Kilmurry (Mitchelstown) to Inchinleamy (SA K Waterford) WRZ. This WRZ is not in deficit and spare capacity can cover the demand in Kilmurry (Mitchelstown)
SAJ-524 **(Part of Grouped Option SAJ-631)** 0500SC0094 Kiskeam	Rationalise Ballydesmond and Kiskeam to Newmarket WRZ
SAJ-468 **(Part of Grouped Option SAJ-617)** 0500SC0103 Knockanevin	Rationalise Knockanevin to Glanworth/Ballykenley/Johnstown (WRZ)
SAJ-399 **(Part of Grouped Option SAJ-595)** 0500SC0088 Knockdrumaclough	Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ
SAJ-262 0500SC0105 Knockeragh	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit

WRZ Name and Option Reference	Option Description
SAJ-413 **(Part of Grouped Option SAJ-597)** 0500SC0166 Knoppogue	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow
SAJ-461 **(Part of Grouped Option SAJ-613)** 0500SC0106 Labbamollogga	Rationalise Labbamollogga to Ballylanders WRZs (study area K)
SAJ-162 0500SC0130 Lombardstown Glantane	Increase GW abstraction from Kilgobnet (Spring) and upgrade Laharan Abbeys Well WTP to supply deficit
SAJ-167 0500SC0066 Lyre	Increase GW abstraction from Lyre spring and upgrade Lyre WTP to supply deficit
SAJ-513 **(Part of Grouped Option SAJ-627)** 0500SC0121 Macroney	Rationalise Macroney to Ballyhooly WRZ (Downing Bridge WTP)
SAJ-406 **(Part of Grouped Option SAJ-597)** 0500SC0131 Mallow	Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit
SAJ-525 **(Part of Grouped Option SAJ-631)** 0500SC0138 Millstreet	Interconnect Millstreet with Newmarket for increased resilience and supply deficit. Rationalise Cockhill WTP and Caherbarnagh WTP - rationalisation within WRZ
SAJ-425 **(Part of Grouped Option SAJ-601)** 0500SC0100 Mitchelstown	Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs
SAJ-514 **(Part of Grouped Option SAJ-628)** 0500SC0107 Monabricka	Rationalise Monabricka to South West Regional Scheme WRZ
SAJ-409 **(Part of Grouped Option SAJ-597)** 0500SC0062 Monaparson	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow

WRZ Name and Option Reference	Option Description
SAJ-414 **(Part of Grouped Option SAJ-597)** 0500SC0064 Monee & Knockabrack	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow
SAJ-281 0500SC0101 Mountain Barracks	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit
SAJ-526 and SAJ-527 **(Part of Grouped Option SAJ-631)** 0500SC0143 Newmarket	New GW abstraction in the vicinity of Ballinatona WTP, upgrade existing Ballinatona WTP and supply deficit. New GW abstraction from Ketragh Springs and new WTP to supply deficit (karstic region)
SAJ-424 **(Part of Grouped Option SAJ-600)** 0500SC0108 Rockchapel	Rationalise Stagmount to Rockchapel WRZ (planned for 2022). Supply spare capacity
SAJ-517 **(Part of Grouped Option SAJ-629)** 0500SC0104 Skahanagh	Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ
SAJ-423 **(Part of Grouped Option SAJ-600)** 0500SC0109 Stagmount	Rationalise Stagmount to Rockchapel WRZ (planned for 2022)
SAJ-398 **(Part of Grouped Option SAJ-595)** 0500SC0165 Strawhall	Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ
SAJ-449 **(Part of Grouped Option SAJ-609)** 3100SC0020 Tallow	New GW abstraction in karstic region and new WTP to supply full demand
SAJ-458 **(Part of Grouped Option SAJ-611)** 3100SC0008 Tinkock/Tinnabinna	Rationalise Tiknock/Tinnabina to Grallagh WRZ
SAJ-528 **(Part of Grouped Option SAJ-631)** 0500SC0139	Rationalise Toureen Derry to Banteer WRZ (approved)

WRZ Name and Option Reference	Option Description
Toureen Derry	
SAJ-415 **(Part of Grouped Option SAJ-597)** 0500SC0186 Rahan	Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow

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 SW 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 [SAH] – D3 [SAJ]) 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 H

European sites identified as at risk of LSEs as a result of progressing the Preferred Approaches for SAH are shown in Table 6.2.1 while potential impact types identified for SAH are discussed below and outlined in Tables 6.2.2 – 6.2.26.

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

SACs	SPAs
Lower River Shannon SAC (002165) Mount Brandon SAC (000375) Akeragh, Banna and Barrow Harbour SAC (000332) Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365) Ballinskelligs Bay and Inny Estuary SAC (000335) Valencia Harbour/ Portmagee Channel SAC (002262)	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161) River Shannon and River Fergus Estuaries SPA (004077) Tralee Bay Complex SPA (004188) Kerry Head SPA (004189) Iveragh Peninsula SPA (004154) Dingle Peninsula SPA (004153)

SACs	SPAs
Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070) Castlemaine Harbour SAC (000343) Slieve Mish Mountains SAC (002185) Blackwater River (Cork/Waterford) SAC (002170) Blasket Islands SAC (002172)	Killarney National Park SPA (004038) Castlemaine Harbour SPA (004029)

The Preferred Approach for SAH includes a number of new or increased surface and groundwater abstractions, some of which are within karstic aquifers with a potential link to surrounding European designated sites. Potential operational LSEs were identified as a result of progressing nine Preferred Approaches associated with SAH. These include four options with groundwater abstractions (SAH-038, SAH-148, SAH-225 and Group SAH-512) and four surface water abstractions across five options (SAH-065, SAH-170, Group SAH-531, and one abstraction from the lower Leane catchment within Killarney National Park associated with both Group SAH-530 and Group SAH-540). These abstractions could potentially impact on wetland bird species utilising wetland habitats within Tralee Bay Complex SPA, as well as aquatic QI species including slender naiad (*Najas flexilis*), freshwater pearl mussel (*Margaritifera margaritifera*), otter (*Lutra lutra*), salmon (*Salmo salar*), Killarney shad (*Alosa fallax killarnensis*), and lamprey species associated with Mount Brandon SAC, Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, Lower River Shannon SAC, and Tralee Bay and Magharees Peninsula, West to Cloghane 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 groundwater dependent habitats designated within SACs, such as blanket bogs (Mount Brandon SAC and Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC), degraded raised bogs (Lower River Shannon SAC), alkaline fens (Lower River Shannon SAC) and depressions on peat substrates of the *Rhynchosporion* (Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC).

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 an SAC. For example, works associated with Group SAH-530 and Group SAH-540 are within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC and require pipeline crossings of Castlemaine Harbour SAC. The works associated with SAH-170 could lead to loss of habitat of the Kerry slug (*Geomalacus maculosus*) within Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. Other pipeline crossings include that of Ballinskelligs Bay and Inny Estuary SAC (Group SAH-531) and Lower River Shannon SAC Group SAH-524).

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. Akeragh, Banna and Barrow Harbour SAC, Tralee Bay and Magharees Peninsula, West to Cloghane SAC, Mount Brandon SAC and Blackwater River (Cork/Waterford) SAC). Changes in water quality from a pollution event could impact on a number of aquatic QI species including but not limited to freshwater pearl mussel, otter, salmon,

Killarney shad and river lamprey (*Lampetra fluviatilis*), as well as aquatic habitats including oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*).

In addition, works adjacent to or in close proximity to Tralee Bay Complex SPA (associated with SAH-038 and SAH-065), Kerry Head SPA (SAH-038), Killarney National Park SPA (Group SAH-530) and Dingle Peninsula SPA (Group SAH-533) could result in disturbance, habitat degradation, mortality and/or physical loss of habitat related impacts to a number of QI bird species utilising habitats situated within the immediate hinterland of these SPAs or in areas outside of a SPA but ecologically connected to it (e.g. grassland, arable farmland). Species that may be impacted include whooper swan (*Cygnus cygnus*), fulmar (*Fulmarus glacialis*), chough (*Pyrrhocorax pyrrhocorax*), merlin (*Falco columbarius*), peregrine (*Falco peregrinus*) and Greenland white-fronted goose (*Anser albifrons flavirostris*). 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. Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA, River Shannon and River Fergus Estuaries SPA, Iveragh Peninsula SPA and Castlemaine Harbour SPA).

Table 6.2.2 - Summary of potential LSEs from option SAH-Group 524 (162, 162a) 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 Shannon SAC (002165)	✓	✓ (C) (GW)		✓	✓

Table 6.2.3 - Summary of potential LSEs from option SAH-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)
Lower River Shannon SAC (002165)	✓	✓ (C&O) (GW)	✓	✓	✓

Table 6.2.4 - Summary of potential LSEs from option SAH-Group 512 (108, 108a) 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)
Mount Brandon SAC (000375)		✓ (C&O) (GW)	✓	✓	✓

Table 6.2.5 - Summary of potential LSEs from option SAH-038 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)
Akeragh, Banna and Barrow Harbour SAC (000332)		✓ (C&O) (GW)	✓		✓

Table 6.2.6 - Summary of potential LSEs from option SAH-Group 531 (181, 182, 204) 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)
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)	✓	✓ (C&O) (SW)	✓	✓	✓
Ballinskelligs Bay and Inny Estuary SAC (000335)	✓	✓ (C) (SW)			✓

Valencia Harbour/ Portmagee Channel SAC (002262)		✓ (C) (SW)			

Table 6.2.7 - Summary of potential LSEs from option SAH-065 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)
Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)	✓	✓ (C&O) (SW)	✓	✓	✓

Table 6.2.8 - Summary of potential LSEs from option SAH-Group 530 (177, 178) 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)
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)	✓	✓ (C&O) (SW)	✓	✓	✓
Castlemaine Harbour SAC (000343)	✓	✓ (C) (SW)		✓	✓
Slieve Mish Mountains SAC (002185)		✓ (C) (SW)			
Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)		✓ (C) (SW)			✓

Akeragh, Banna and Barrow Harbour SAC (000332)		✓ (C) (SW)			

Table 6.2.9 - Summary of potential LSEs from option SAH-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)
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)		✓ (C&O) (GW)	✓		✓

Table 6.2.10 - Summary of potential LSEs from option SAH-170 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)
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)	✓	✓ (C&O) (SW)	✓	✓	✓
Castlemaine Harbour SAC (000343)		✓ (C) (SW)			

Table 6.2.11 - Summary of potential LSEs from option SAH-Group 540 (215) 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)
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)	✓	✓ (C&O) (SW)	✓	✓	✓
Castlemaine Harbour SAC (000343)		✓ (C) (SW)			
Blackwater River (Cork/Waterford) SAC (002170)		✓ (C) (SW)			

Table 6.2.12 - Summary of potential LSEs from option SAH-122 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)
Mount Brandon SAC (000375)		✓ (C) (GW)			✓

Table 6.2.13 - Summary of potential LSEs from option SAH-173 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)
Castlemaine Harbour SAC (000343)		✓ (C)			

Table 6.2.14 - Summary of potential LSEs from option SAH-138 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)
Tralee Bay and Magharees Peninsula, West to Cloghane SAC (002070)		✓ (C) (GW)			

Table 6.2.15 - Summary of potential LSEs from option SAH-Group 533 (186, 187) 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)
Blasket Islands SAC (002172)		✓ (C) (GW)			✓

Table 6.2.16 - Summary of potential LSEs from option SAH- Group 524 (162, 162a) 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)
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)					✓
River Shannon and River Fergus Estuaries SPA (004077)		✓ (C) (GW)			

Table 6.2.17 - Summary of potential LSEs from option SAH-038 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)
Tralee Bay Complex SPA (004188)	✓	✓ (C) (GW)			✓
Kerry Head SPA (004189)	✓	✓ (C) (GW)		✓	✓

Table 6.2.18 - Summary of potential LSEs from option SAH-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)
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)					✓

Table 6.2.19 - Summary of potential LSEs from option SAH-Group 531 (181, 182, 204) 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)
Iveragh Peninsula SPA (004154)		✓ (C) (SW)			✓

Table 6.2.20 - Summary of potential LSEs from option SAH-065 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)
Tralee Bay Complex SPA (004188)	✓	✓ (C&O) (SW)	✓	✓	✓
Dingle Peninsula SPA (004153)		✓ (C) (SW)			

Table 6.2.21 - Summary of potential LSEs from option SAH-Group 530 (177, 178) 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)
Killarney National Park SPA (004038)	✓	✓ (C) (SW)			✓
Castlemaine Harbour SPA (004029)		✓ (C) (SW)			
Tralee Bay Complex SPA (004188)		✓ (C) (SW)			✓

Table 6.2.22 - Summary of potential LSEs from option SAH-170 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)
Castlemaine Harbour SPA (004029)		✓ (C) (SW)			
Iveragh Peninsula SPA (004154)					✓

Table 6.2.23 - Summary of potential LSEs from option SAH-Group 540 (215) 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)
Killarney National Park SPA (004038)	✓	✓ (C) (SW)			✓

Table 6.2.24 - Summary of potential LSEs from option SAH-173 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)
Dingle Peninsula SPA (004153)		✓ (C)			✓
Castlemaine Harbour SPA (004029)		✓ (C)			

Table 6.2.25 - Summary of potential LSEs from option SAH-138 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)
Castlemaine Harbour SPA (004029)		✓ (C) (GW)			

Table 6.2.26 - Summary of potential LSEs from option SAH-Group 533 (186, 187) 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)
Dingle Peninsula SPA (004153)	✓	✓ (C) (GW)		✓	✓

6.2.2 Study Area I

European sites identified as at risk of LSE as a result of progressing the Preferred Approaches for SAI are shown in Table 6.2.27 while potential impact types identified for SAI are discussed below and outlined in Tables 6.2.28 – 6.2.58.

Table 6.2.27 - European sites within the ZoI of Study Area I (Cork/South Kerry) with LSEs identified and the potential for AESI (in the absence of more detail/mitigation)

SACs	SPAs
The Gearagh SAC (000108)	Mullaghanish to Musheramore Mountains SPA (004162)
Ballymacoda (Clonpriest and Pillmore) SAC (000077)	The Gearagh SPA (004109)
Blackwater River (Cork/Waterford) SAC (002170)	Cork Harbour SPA (004030)
Barley Cove to Ballyrisode Point SAC (001040)	Ballymacoda Bay SPA (004023)
Caha Mountains SAC (000093)	Ballycotton Bay SPA (004022)
Glengarriff Harbour and Woodland SAC (000090)	Blackwater Estuary SPA (004028)
Roaringwater Bay and Islands SAC (000101)	Beara Peninsula SPA (004155)
Kenmare River SAC (002158)	Sheep’s Head to Toe Head SPA (004156)
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)	Courtmacsherry Bay SPA (004219)
Kilgarvan Ice House SAC (000364)	Sovereign Islands SPA (004124)
Farranamanagh Lough SAC (002189)	
Sheep's Head SAC (000102)	
Courtmacsherry Estuary SAC (001230)	
Bandon River SAC (002172)	
Ballinskelligs Bay and Inny Estuary SAC (000335)	

Lough Hyne Nature Reserve and Environs SAC (000097) Great Island Channel SAC (001058)	

There are a number of new or increased surface and groundwater abstractions included in the Preferred Approach for SAI. Potential operational LSEs were identified as a result of progressing six options associated with the Preferred Approach for SAI, three associated with groundwater abstractions (SAI-480, SAI-660 and Group SAI-949), and three linked to surface water abstractions (SAI-457, SAI-652 and Group SAI-923). These abstractions could potentially impact on bird species utilising wetland habitats within Blackwater Estuary SPA, Ballymacoda Bay SPA and Beara Peninsula SPA, as well as aquatic QI species (including freshwater pearl mussel, white-clawed crayfish (*Austropotamobius pallipes*), otter, salmon, lamprey species, Killarney shad (*Alosa fallax killarnensis*), and slender naiad (*Najas flexilis*)) associated with Kenmare River SAC, Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, and Blackwater River (Cork/Waterford) SAC through a reduction or changes in water levels/flows (water table/availability) and or changes in water quality (habitat degradation/hydrological changes). These abstractions could also potentially affect groundwater dependent habitats designated within SACs, such as Northern Atlantic wet heaths with *Erica tetralix* (Sheep's Head SAC), both Atlantic and Mediterranean salt meadows (Ballymacoda (Clonpriest and Pillmore) SAC and Blackwater River (Cork/Waterford) SAC), and alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (Blackwater River (Cork/Waterford) SAC).

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 SAI-949 require pipeline crossings of Ballymacoda (Clonpriest and Pillmore) SAC. The works associated with option SAI-645 and Group SAI-955 are within the 2.5km core foraging ranges of the lesser horseshoe (LHS) bat (*Rhinolophus hipposideros*) within Kilgarvan Ice House SAC and Glengarriff Harbour and Woodland SAC respectively. As such, vegetation, hedgerow or tree clearance associated with the works or lighting impacts from the works could sever important commuting routes for LHS bats commuting between their roost site in the SACs and foraging areas outside the confines of the SACs. This would require further assessment to ensure impacts are avoided. The works associated with Group SAI-955 could also lead to Annex I habitat loss, including that of Northern Atlantic wet heaths with *Erica tetralix* within Caha Mountains SAC due to pipelines crossing the SAC. Group SAI-971 also includes a pipeline crossing of Courtmacsherry Estuary 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 European sites that could potentially be impacted included The Gearagh SAC, Barley Cove to Ballyrisode Point SAC, Roaringwater Bay and Islands SAC, Farranamanagh Lough SAC, Bandon River SAC, Ballinskelligs Bay and Inny Estuary SAC, Kilgarvan Ice House SAC, Lough Hyne Nature Reserve and Environs SAC, and Great Island Channel SAC. Changes in water quality from a pollution event could impact on a number of aquatic QI species including but not limited to, freshwater pearl mussel, otter, Killarney shad and brook lamprey (*Lampetra planeri*), as well as aquatic habitats including oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae*).

Potential construction related LSEs were identified for a number of SPAs. There may be disturbance, habitat degradation, mortality and/or physical loss of habitat related impacts to a number of QI bird species utilising habitats situated within the immediate hinterland of these SPAs or in areas outside of a SPA but ecologically connected to it (e.g. grassland, arable farmland). The SPAs potentially affected include Beara Peninsula SPA (from options SAI-480 and SAI-768), Ballymacoda Bay SPA (from Group SAI-949), and Courtmacsherry Bay SPA (from Group SAI-971). Species that may be impacted include fulmar, chough, and various waterbird species. 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. Mullaghanish to Musheramore Mountains SPA, The Gearagh SPA, Ballycotton Bay SPA, Sheep's Head to Toe Head SPA, Blackwater Estuary SPA, Cork Harbour SPA, and Sovereign Islands SPA).

Table 6.2.28 - Summary of potential LSEs from options SAI-060 and SAI-771 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)
The Gearagh SAC (000108)		✓ (C) (SW)*			

* SW abstraction associated with SAI-060 only

Table 6.2.29 - Summary of potential LSEs from options SAI-Group 877 (231, 293) and SAI-Group 950 (836, 837) 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)
Ballymacoda (Clonpriest and Pillmore) SAC (000077)		✓ (C) (GW)			

Table 6.2.30 - Summary of potential LSEs from option SAI-457 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)
Barley Cove to Ballyrisode Point SAC (001040)		✓ (C&O) (SW)	✓		✓

Table 6.2.31 - Summary of potential LSEs from option SAI-468 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)
Caha Mountains SAC (000093)		✓ (C)			✓
Glengarriff Harbour and Woodland SAC (000090)		✓ (C)			✓

Table 6.2.32 - Summary of potential LSEs from option SAI-498 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)
Barley Cove to Ballyrisode Point SAC (001040)		✓ (C) (GW)			
Roaringwater Bay and Islands SAC (000101)		✓ (C) (GW)			

Table 6.2.33 - Summary of potential LSEs from option SAI-630 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)
Kenmare River SAC (002158)		✓ (C) (SW)			✓

Table 6.2.34 - Summary of potential LSEs from option SAI-643 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)
Kenmare River SAC (002158)		✓ (C) (SW)			
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)		✓ (C) (SW)			✓

Table 6.2.35 - Summary of potential LSEs from option SAI-645 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)
Kilgarvan Ice House (000364)	✓				✓
Kenmare River SAC (002158)		✓ (C)			

		(GW)			

Table 6.2.36 - Summary of potential LSEs from option SAI-652 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)
Kenmare River SAC (002158)		✓ (C&O) (SW)	✓		
Caha Mountains SAC (000093)					✓

Table 6.2.37 - Summary of potential LSEs from option SAI-660 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)
Farranamanagh Lough SAC (002189)		✓ (C) (GW)			
Sheep's Head SAC (000102)		✓ (C&O) (GW)	✓		✓

Table 6.2.38 - Summary of potential LSEs from options SAI-768 and SAI-Group 960 (882, 883) 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)
Kenmare River SAC		✓			✓

(002158)		(C) (GW)*			

*GW abstraction associated with SAI-768 only

Table 6.2.39 - Summary of potential LSEs from option SAI-779 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)
Courtmacsherry Estuary SAC (001230)		✓ (C)			

Table 6.2.40 - Summary of potential LSEs from option SAI-784 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)
Barley Cove to Ballyrisode Point SAC (001040)		✓ (C)			

Table 6.2.41 - Summary of potential LSEs from option SAI-Group 897 (399, 434) 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)
Bandon River SAC (002172)		✓ (C) (SW)			

Table 6.2.42 - Summary of potential LSEs from option SAI-Group 923 (641, 642) 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)
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (000365)		✓ (C&O) (SW)	✓		✓
Ballinskelligs Bay and Inny Estuary SAC (000335)		✓ (C) (SW)			
Kenmare River SAC (002158)		✓ (C) (SW)			✓

Table 6.2.43 - Summary of potential LSEs from option SAI-Group 949 (830, 831, 832, 833) 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)
Ballymacoda (Clonpriest and Pillmore) SAC (000077)	✓	✓ (C&O) (GW)	✓		✓
Blackwater River (Cork/Waterford) SAC (002170)		✓ (C&O) (GW)	✓		✓

Table 6.2.44 - Summary of potential LSEs from option SAI-Group 955 (861, 862, 863, 864, 865) 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)
Caha Mountains SAC (000093)	✓	✓ (C) (SW)		✓	✓
Glengarriff Harbour and Woodland SAC (000090)	✓	✓ (C) (SW)		✓	✓
Roaringwater Bay and Islands SAC (000101)		✓ (C) (SW)			

Table 6.2.45 - Summary of potential LSEs from option SAI-Group 962 (887, 888) 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)
Roaringwater Bay and Islands SAC (000101)		✓ (C)			✓
Lough Hyne Nature Reserve and Environs SAC (000097)		✓ (C)			✓

Table 6.2.46 - Summary of potential LSEs from option SAI-Group 971 (939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960) 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)
Courtmacsherry Estuary SAC (001230)	✓	✓ (C) (SW)			✓
Great Island Channel SAC (001058)		✓ (C) (SW)			

Table 6.2.47 - Summary of potential LSEs from option SAI-011 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)
Mullaghanish to Musheramore Mountains SPA (004162)					✓

Table 6.2.48 - Summary of potential LSEs from options SAI-060 and SAI-771 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)
The Gearagh SPA (004109)		✓ (C) (SW)			

* SW abstraction associated with SAI-060 only

Table 6.2.49 - Summary of potential LSEs from options SAI-Group 877 (231, 293) and SAI-Group 950 (836, 837) 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)
Ballymacoda Bay SPA (004023)		✓ (C) (GW)			

Table 6.2.50 - Summary of potential LSEs from option SAI-193 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)
Ballycotton Bay SPA (004022)		✓ (C) (GW)			

Table 6.2.51 - Summary of potential LSEs from option SAI-480 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)
Beara Peninsula SPA (004155)	✓	✓ (C&O) (GW)	✓		✓

Table 6.2.52 - Summary of potential LSEs from option SAI-498 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)
Sheep's Head to Toe Head SPA (004156)		✓ (C) (GW)			

Table 6.2.53 - Summary of potential LSEs from option SAI-768 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)
Beara Peninsula SPA (Cork) (004155)	✓	✓ (C) (GW)			✓

Table 6.2.54 - Summary of potential LSEs from option SAI-779 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)
Courtmacsherry Bay SPA (004219)		✓ (C)			

Table 6.2.55 - Summary of potential LSEs from option SAI-Group 949 (830, 831, 832, 833) 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)
Ballymacoda Bay SPA (004023)	✓	✓ (C&O) (GW)	✓	✓	✓
Blackwater Estuary SPA (004028)		✓ (C&O) (GW)	✓		✓

Table 6.2.56 - Summary of potential LSEs from option SAI-Group 960 (882, 883) 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)
Beara Peninsula SPA (004155)		✓ (C) (SW)			✓

Table 6.2.57 - Summary of potential LSEs from option SAI-Group 963 (889, 890, 964) 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)
Cork Harbour SPA (004030)		✓ (C) (GW)			

Table 6.2.58 - Summary of potential LSEs from option SAI-Group 971 (939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960) 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)
Courtmacsherry Bay SPA (004219)	✓	✓ (C) (SW)		✓	✓
Cork Harbour SPA (004030)		✓ (C) (SW)			
Sovereign Islands SPA (004124)		✓ (C) (SW)			

6.2.3 Study Area J

European sites identified with potential for LSEs as a result of progressing the Preferred Approaches for SAJ are shown in Table 6.2.59 while potential impact pathways identified for SAJ and discussed below and outlined in Tables 6.2.60 – 6.2.72.

Table 6.2.59 - European sites within the ZoI of Study Area J (North Cork/West Waterford) with LSE identified and the potential for AESI (in the absence of more detail/mitigation)

SACs	SPAs
Blackwater River (Cork/Waterford) SAC (002170)	Blackwater Estuary SPA (004028)

Lower River Suir SAC (002137)	Blackwater Callows SPA (004094)
Lower River Shannon SAC (002165)	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)

There are no new or increased surface water abstractions in the Preferred Approach for SAJ. However, potential operational LSEs were identified as a result of progressing seven options with increased groundwater abstractions (SAJ-128, Group SAJ-531, Group SAJ-597, Group SAJ-520, Group SAJ-627, Group SAJ-595 and Group SAJ-614) and four options with new groundwater abstractions (Group SAJ-609, Group SAJ-629, Group SAJ-630 and Group SAJ-631). These abstractions were not predicted to have operational impacts on any SPAs. The only European site that could potentially be impacted by these abstractions is the Blackwater River (Cork/Waterford) SAC. The abstractions could potentially impact aquatic QI species (including freshwater pearl mussel, white-clawed crayfish, otter, salmon, shad and lamprey species) associated with the 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 groundwater dependent habitats designated within the SAC, such as alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* and water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation.

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 Group SAJ-629, Group SAJ-631, Group SAJ-597, Group SAJ-611 and Group SAJ-627 require pipeline crossings of Blackwater River (Cork/Waterford) SAC. Option Group SAJ-600 requires a pipeline crossing of Lower River Shannon SAC. Other options with works within Blackwater River (Cork/Waterford) SAC with similar potential impacts were SAJ-128, Group SAJ-531 and Group SAJ-595.

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. Blackwater River (Cork/Waterford) SAC, Lower River Suir SAC and Lower River Shannon SAC). Changes in water quality from a pollution event could impact on a number of aquatic QI species including but not limited to freshwater pearl mussel, white-clawed crayfish, otter, salmon, shad and lamprey species, as well as aquatic habitats such as water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion*.

In addition, works adjacent to or in close proximity to Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (associated with Group SAJ-600) could result in disturbance and/or physical loss of habitat related impacts to hen harrier (*Circus cyaneus*) utilising habitats situated within the immediate hinterland of the SPA or in areas outside of the SPA but ecologically connected to it (e.g. grassland, arable farmland). Other potential LSEs were identified for Blackwater Estuary SPA and Blackwater Callows SPA 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. Species that may be impacted were all waterbirds and included whooper swan, dunlin (*Calidris alpina*) and curlew (*Numenius arquata*).

Table 6.2.60 - Summary of potential LSEs from options SAJ-291, SAJ-223, SAJ-272, SAJ-262, SAJ-162, SAJ-167, SAJ-188, SAJ-281, SAJ-Group 520 (154, 155, 278), SAJ-Group 601 (425, 426), SAJ-Group 616 (466) and SAJ-Group 617 (467, 468) 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) (GW)*			

* GW abstraction associated with SAJ-162, SAJ-167, SAJ-Group 520, SAJ-Group 601, SAJ-Group 616 and SAJ-Group 617 only

Table 6.2.61 - Summary of potential LSEs from options SAJ-128, SAJ-Group 531 (260, 325), SAJ-Group 597 (406, 407, 408, 409, 411, 412, 413, 414, 415), SAJ-Group 627 (511, 512, 513), SAJ-Group 595 (396, 397, 398, 399, 400, 401), SAJ-Group 629 (515, 516, 517) and SAJ-Group 631 (520, 521, 522, 523, 524, 525, 526, 527, 528) 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&O) (GW)	✓	✓	✓

Table 6.2.62 - Summary of potential LSEs from option SAJ-Group 611 (455, 456, 457, 458) 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)		✓	✓

		(GW)			

Table 6.2.63 - Summary of potential LSEs from options SAJ-Group 609 (449, 450, 451) and SAJ-Group 614 (462) 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&O) (GW)	✓	✓	✓

Table 6.2.64 - Summary of potential LSEs from option SAJ-Group 613 (461) 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)			
Blackwater River (Cork/Waterford) SAC (002170)		✓ (C) (GW)			

Table 6.2.65 - Summary of potential LSEs from option SAJ-Group 600 (423, 424) 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 Shannon SAC (002165)	✓	✓ (C)		✓	✓

Table 6.2.66 - Summary of potential LSEs from option SAJ-Group 628 (514) 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 Shannon SAC (002165)		✓ (C)			

Table 6.2.67 - Summary of potential LSEs from option SAJ-Group 630 (518, 519) 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&O) (GW)	✓		✓

Table 6.2.68 - Summary of potential LSEs from options SAJ-291, SAJ-223, SAJ-128 and SAJ-Group 609 (449, 450, 451) 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 Estuary SPA (004028)		✓ (C) (GW)*			

* GW abstraction associated with SAJ-128 and SAJ-Group 609 only

Table 6.2.69 - Summary of potential LSEs from options SAJ-281, SAJ-Group 531 (260, 325), SAJ-Group 601 (425, 426), SAJ-Group 597 (406, 407, 408, 409, 411, 412, 413, 414, 415), SAJ-Group 617 (467, 468) and SAJ-Group 613 (461) 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)*			

* GW abstraction associated with SAJ-Group 531, SAJ-Group 601, SAJ-Group 597, SAJ-Group 617 and SAJ-Group 613 only

Table 6.2.70 - Summary of potential LSEs from option SAJ-Group 611 (455, 456, 457, 458) 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 Estuary SPA (004028)		✓ (C) (GW)			✓

Table 6.2.71 - Summary of potential LSEs from option SAJ-Group 600 (423, 424) 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)
Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA (004161)	✓				✓

Table 6.2.72 - Summary of potential LSEs from options SAJ-Group 627 (511, 512, 513), SAJ-Group 595 (396, 397, 398, 399, 400, 401) and SAJ-Group 614 (462) 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)			✓

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 SW 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-SW 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-SW.

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).

Irish Water will implement the objectives of their Biodiversity Action Plan (Irish Water, 2021). Where appropriate this would include measures to ensure “no net loss” of biodiversity across Irish Water 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 Irish Water 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 C692: Environmental Good Practice on Site;
- 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-SW as a minimum standard, unless project-specific 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-SW 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:

[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, January 2022)

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 Killarney shad and 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-SW. 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-SW. All works relating to invasive species will be implemented in line with relevant national guidelines as well as those relevant guidelines produced by Irish Water (Irish Water, 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.
SAH	-	-	No option specific mitigation measures required for SAH.
SAI	-	-	No option specific mitigation measures required for SAI.
SAJ (Options SAJ-597, SAJ-611, SAJ-627, SAJ-600, SAJ-629 and SAJ-631)	Blackwater River (Cork/Waterford) SAC, Lower River Shannon 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 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 [SAH] – D3 [SAJ]) 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 SW 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-SW 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 [SAH] – E3 [SAJ] and E4 [SW region]), the in-combination assessment between regional groups is detailed in Appendix E (see Table E5 [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-SW.

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-SW 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)
Irish Water Plans [RWRP-EM not included in Table 7.1 as it is assessed in more detail in Table 7.2 below]				
Water Services Strategic Plan (WSSP)[16] The WSSP is the highest tier Irish Water 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) Irish Water 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-SW 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, January 2022)
[17] https://www.water.ie/docs/WSSP-AA-Natura-Impact-Statement-(Web).pdf (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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-SW 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 SW 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 Irish Water.	• 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-SW 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-SW. 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, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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, Irish Water 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-SW 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, Irish Water 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, January 2022)
[20] https://www.water.ie/docs/Lead_AA-Determination.pdf (Accessed, March 2022)

Plan/Project	Potential impact types common to RWRP-SW 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-SW. 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	N

[21] http://npf.ie/wp-content/uploads/Project-Ireland-2040-NPF.pdf (Accessed, January 2022)
[22] http://npf.ie/wp-content/uploads/2017/09/Natura-Impact-Statement-%E2%80%93-Ireland-2040.pdf (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
			conservation objectives are predicted as a result of in-combination effects.	
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].	• 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-SW. As with all projects arising from the RWRP-SW, 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, January 2022)
[24] https://emra.ie/rses/ (Accessed, January 2022)
[25] http://www.southernassembly.ie/regional-planning/rses (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
Regions are connected through hydrological 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	• 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-SW. 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, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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 due this year.				
Forestry Programme 2014 – 2020: IRELAND[27] The objective of the programme 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.	• 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 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'[28] 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[29] which concluded that there was potential for significant effects on European sites from the implementation of the programme. Both the Forestry Programme and the RWRP-SW 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
National Marine Planning Framework (NMPF)[30] The Plan by the	• Habitat loss or destruction • Loss of key supporting habitats and	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	N

[27] https://www.gov.ie/en/publication/forestry-policy-and-strategy/#forestry-programme-2014-2020 (Accessed, March 2022)
[28] 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, March 2022)
[29] https://wayback.archive-it.org/11501/20201127093539/https:/www.agriculture.gov.ie/media/migration/forestry/publicconsultation/newforestryprogramme2014-2020/nis/ForestryProgrammeNaturaImpactStatement290914.pdf (Accessed, March 2022)
[30] https://www.gov.ie/en/publication/60e57-national-marine-planning-framework/ (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
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.	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		the potential for indirect impacts arising from the developments arising from the various national policy objectives. Both the NMPF and RWRP-SW 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.	
Limerick County Development Plan 2010-2016 (as extended)/Draft Limerick Development Plan 2022-2028[31] The Plan/Draft Plan sets out an overall strategy for the proper planning and	• Loss/reduction of habitat area • Habitat or species fragmentation • Disturbance to key species • Reduction in species density • Changes in key indicators of conservation value such as	Y	Limerick County Development Plan 2010-2016 (extended)/Draft 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 European sites. There is the potential for in-combination effects with the Plan/Draft Plan and the RWRP-SW. However, a number of mitigation measures are proposed as part of the Development Plan in Chapter 6 of the accompanying NIS/in the Draft Development Plan in Chapter 8 of the accompanying. The Plan/Draft Plan states that with these mitigation measures in place there will be no significant adverse effects as a result of the implementation of the Plan/Draft Plan on designated European sites, alone or in-combination with other plans or projects.	N

[31] https://www.limerick.ie/council/services/planning-and-property/limerick-development-plan/limerick-development-plan-2022-2028 (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
sustainable development of the functional area of Limerick, with the Draft Plan covering a six-year period between 2022 and 2028. The Draft Plan is at Stage 3 and a Public Consultation phase for submissions on the Proposed Material Alterations to the Draft Plan has closed and it is expected to be adopted during 2022.	water quality		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.	
Clare County Development Plan 2017-2023[32] The Plan sets out an overall strategy for the proper planning and sustainable development of the functional area of Clare County Council over a six-year period.	• Changes in water quality • Disturbance to lesser horseshoe bats • Changes to the hydrology of groundwater-dependent QI habitats • Invasive non-native species • Disturbance to QI birds	Y	Clare County Development Plan 2017-2023 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-SW. However, the NIS for Clare County Development Plan determined that with the application of the mitigation measures provided in Table C2 of the NIS, there would be no adverse effects on the integrity of European Sites in isolation or in-combination with other Plans and Projects acting in the same area. 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.clarecoco.ie/services/planning/ccdp2017-2023/ (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
Cork County Development Plan 2014/Draft Cork County Development Plan 2022-2028[33] The Plan/Draft Plan sets out Cork County Council's overall strategy for the proper planning and sustainable development of the county, with the Draft Plan covering the period between 2022 and 2028. It takes national and regional level plans, Government policy and statutory guidelines into account to create one single planned approach for the future development of the county. The Draft Plan is at Stage 3 and a Chief Executive's Report has been prepared on	• Changes in water quality • Habitat loss • Habitat degradation • Disturbance • Damage to the size, characteristics or reproductive ability of populations of QI species	Y	Cork County Development Plan 2014/Draft Cork County Development Plan 2022-2028 was subject to a SEA, and both Stage 1 and Stage 2 AA. The Plan/Draft Plan identified European sites and QIs that could be affected by the Plan/Draft Plan and what the potential LSEs were. There is the potential for in-combination effects with the Plan/Draft Plan and the RWRP-SW. However, with the recommendations set out in Table 6 of the NIR for the Plan/Tables 8.1 and 8.2 of the NIR[34] for the Draft Plan, there is no potential for adverse effects on European sites. 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

[33] https://www.corkcoco.ie/en/cork-county-development-plan-2022-2028 (Accessed, January 2022)
[34] https://www.corkcoco.ie/sites/default/files/2021-04/volume-6-environmental-reports.pdf (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
submissions/ observations made in relation to the Proposed Amendments to the Draft Plan which is expected to be adopted during 2022.				
Cork City Development Plan 2015-2021/Draft Cork City Development Plan 2022-2028[35] The Plan/Draft Plan is a land use plan and overall strategy for the proper planning and sustainable development of the functional area of Cork City. The Draft Plan covers the period 2022-2028. The Draft Plan is at Phase 3 and a Public Consultation phase for submissions on the Proposed Material Alterations to the Draft Plan is ongoing. It is expected to be adopted	• Loss/reduction of habitat area • Habitat or species fragmentation • Disturbance to key species • Reduction in species density • Changes in key indicators of conservation value (e.g., water quality) • Climate change	Y	Cork City Development Plan 2015-2021/Draft Cork City Development Plan 2022-2028 was subject to a SEA, and Stage 1 AA Screening, and the Draft Cork City Development Plan 2022-2028 was also subject to Stage 2 AA. The Plan was found to have no siginifiant effects on the Natura 2000 network, but the Draft Plan identified European sites and QIs that could be affected by the Draft Plan and any potential LSEs. There is the potential for in-combination effects with the Draft Plan and the RWRP-SW. However, with the recommendations set out in Section 5 of the NIR for the Draft Plan, there is no potential for adverse effects on European sites. 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

[35] https://www.corkcity.ie/en/proposed-cork-city-development-plan-2022-2028/ (Accessed, April 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
during 2022.				
Kerry County Development Plan 2015-2021/Draft Kerry County Development Plan 2022-2028[36] The Plan/Draft Plan incorporates aims, objectives, policies, and guidelines to provide for the proper planning and sustainable development of County Kerry. The Draft Plan is at Stage 2 and the Material Amendments resulting from the Public Consultation on the Draft Plan are being prepared. It is expected to be adopted during 2022.	• Direct loss of habitat • Degradation of habitat, species abundance or community structure • Disturbance • Habitat or species fragmentation • Indirect effects such as quality of the environment	Y	Kerry County Development Plan 2015-2021/Draft Kerry 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/Draft Plan and the RWRP-SW. However, with the recommendations set out in Chapter 5 of the NIR, the Plan/Draft Plan will not adversely affect the integrity of any Natura 2000 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
North Tipperary County Development Plan 2010/South Tipperary Development Plan 2009/Draft Tipperary	• Loss/reduction of habitat area • Habitat or species fragmentation • Disturbance to key species • Reduction in	Y	North Tipperary County Development Plan 2010/South Tipperary Development Plan 2009/Draft Tipperary County Development Plan 2022-2028 was subject to a SEA, Stage 1 and Stage 2 AA and LSEs were identified for the Plans/Draft Plan. There is the potential for in-combination effects with the Plans/Draft Plan and the RWRP-SW. Having incorporated the mitigation measures outlined in Section 5 of the NIR, it is concluded that the Plans/Draft Plan is not foreseen to give rise to	N

[36] https://consult.kerrycoco.ie/en/consultation/draft-kerry-county-development-plan-2022-2028 (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
County Development Plan 2022-2028[37] The Plans/Draft Plan are/is a land use plan and overall strategy for the proper planning and sustainable development of the functional area of County Tipperary, with the Draft Plan covering the six-year period 2022-2028.The Draft Plan is at Stage 3 and a Public Consultation on the Proposed Amendments to the Draft Plan is ongoing. It is expected to be adopted during 2022.	species density • Changes of indicators of conservation value e.g., water quality		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.	
Waterford City Development Plan 2013-2019/Waterford County Development Plan 2011-2017/Draft Waterford City and County Development Plan 2022-2028[38]	• Changes in water quality • Habitat loss • Habitat degradation • Disturbance • Invasive species	Y	Waterford City Development Plan 2013-2019/Waterford County Development Plan 2011-2017/Draft Waterford City and County Development Plan 2022-2028 was subject to a SEA, and Stage 1 AA Screening, and the Draft Plan was also subject to Stage 2 AA and LSEs were identified for the Plan. The Plans were found to have no siginifiant effects on the Natura 2000 network, but the Draft Plan identified European sites and QIs that could be affected by the Draft Plan and any potential LSEs. There is the potential for in-combination effects with the Draft Plan and the	N

[37] https://www.tipperarycoco.ie/cdp (Accessed, January 2022)
[38] https://consult.waterfordcouncil.ie/en/consultation/draft-waterford-city-and-county-development-plan-2022-2028 (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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 Plans/Draft Plan are/is a land use plan and overall strategy for the proper planning and sustainable development of Waterford City and County, with the Draft Plan covering the six-year period 2022-2028. The Draft Plan is expected to be adopted during 2022.			RWRP-SW. However, with the recommendations set out in Chapter 4 of the NIR, the potential impacts associated with the Draft Plan will not adversely affect the integrity of the Natura 2000 Network 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.	
Strategic Integrated Framework Plan (SIFP) for the Shannon Estuary[39] The SIFP for the Shannon Estuary is an inter-jurisdictional land and marine based spatial planning strategy for the future development and management of the Shannon Estuary. The aim of the SIFP is to identify the potential	• Loss of habitat • Fragmentation • Disturbance • Species population density • Water resource • Water Quality	Y	The SIFP for the Shannon Estuary was subject to a SEA, Stage 1 and Stage 2 AA and LSEs were identified for the Plan. The AA[40] concluded that there was potential for significant effects on European sites from the implementation of the Plan. Both the SIFP and RWRP-SW 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 SIFP in Chapter 6 of the accompanying NIS for the SIFP. The SIFP acknowledged that following the application and adherence of the SIFP mitigation measures a risk of adverse effect on site integrity may still remain and will be determined by the project level detail of the future development opportunity, and its specific use, nature, scale, extent, type and exact content and layout - depending on this, there may or may not be an impact on the qualifying interests of the Natura 2000 sites. Given the mitigation measures set out in Chapter 6 of this NIS and with the	N

[39] https://shannonestuarysifp.wordpress.com/sifp-documents/ (Accessed, March 2022)
[40] https://shannonestuarysifp.files.wordpress.com/2015/08/nir_2211_2013.pdf (Accessed, March 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
nature and location of future development, economic growth and employment that can be sustainably accommodated within the Shannon Estuary.			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.	
Shannon Foynes Port Company - Vision 2041[41] Shannon Foynes Port Company has developed a thirty-year strategic vision for the provision of port infrastructure and services for their operations on the Shannon Estuary.	• Habitat loss • Mortality • Habitat degradation including pollution • Disturbance • Invasive species • Changes to hydrology/ water quality	Y	Shannon Foynes Port Company - Vision 2041 was subject to AA and SEA and LSEs were identified for the strategy. There is the potential for in-combination effects with the strategy and the RWRP-SW. However, with the recommendations set out in the NIR for the strategy, the potential impacts associated with the strategy will not adversely affect the integrity of the European sites 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
Food Vision 2030[42] This is a ten-year agri-food strategy that aims to establish how the agri-food sector is to develop up to 2030 for the benefit of the Irish economy, society and	• Agricultural intensification • Atmospheric factors • Diffuse pollution of surface water and groundwater • Drainage • Reduced	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-SW. However, with the mitigation measures proposed as part of Food Vision 2030 in Chapter 5 of the accompanying NIS for the Strategy, there is no potential for	N

[41] https://sfpc.ie/wp-content/uploads/2020/07/SFPC-MASTERPLAN-Final.pdf (Accessed, March 2022)
[42] https://www.gov.ie/en/publication/c73a3-food-vision-2030-a-world-leader-in-sustainable-food-systems/ (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
environment.	breeding success or increased predation, possibly resulting in reduced population viability • Impacts to inshore and offshore fisheries		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[43] 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[44] The Plan sets out actions through which a range of government,	• Strengthened legislation to tackle biodiversity loss • Increased awareness of	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. Ireland's Vision for Biodiversity is: "That biodiversity and ecosystems in Ireland are conserved and restored, 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	N

[43] https://ec.europa.eu/environment/strategy/biodiversity-strategy-2030_en (Accessed, January 2022)
[44] https://www.npws.ie/legislation/national-biodiversity-plan (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
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.	biodiversity and ecosystem services • Conservation of biodiversity and ecosystem services • Improved management of protected areas and species		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 levels. Over the next five years, this plan will work to bring about landscape where pollinators can flourish.	• 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. 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 Waste Action Plan for a Circular Economy 2020 – 2025[46] This plan is Ireland's	• 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	N

[45] https://pollinators.ie/aipp-2021-2025/ (Accessed, January 2022)
[46] https://www.gov.ie/en/publication/4221c-waste-action-plan-for-a-circular-economy/ (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
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.			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.	
Climate Action Plan 2023[47] The plan implements the carbon budgets and sectoral emissions ceilings brought in in 2022 and sets a roadmap for taking decisive action to halve Ireland's emissions by 2030 and reach net zero no later than 2050.	• Loss/reduction of habitat area • Habitat fragmentation • Disturbance to key species • Reduction in species density • Alterations to water quality/water movement	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 RWRP-SW. 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 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

[47] https://www.gov.ie/pdf/?file=https://assets.gov.ie/243585/9942d689-2490-4ccf-9dc8-f50166bab0e7.pdf#page=null (Accessed, January 2023)

Plan/Project	Potential impact types common to RWRP-SW 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)
Offshore Renewable Energy Development Plan[48] This plan provides a framework for the sustainable development of Ireland's offshore renewable energy resource.	• Loss or damage to habitats • Damage to non-mobile species • Impacts to water quality and water movement • Species disturbance • Collision risk • Changes to food availability	Y	The Offshore Renewable Energy Development Plan (OREDP) 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 and the RWRP-SW. However, with the mitigation measures proposed as part of the OREDP in Chapter 11 of the accompanying 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
National Adaptation Framework (NAF)[49] 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

[48] https://www.gov.ie/en/publication/e13f49-offshore-renewable-energy-development-plan/ (Accessed, January 2022)
[49] https://www.gov.ie/en/publication/fbe331-national-adaptation-framework/ (Accessed, January 2022)

Plan/Project	Potential impact types common to RWRP-SW 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)
Tourism Development and Innovation 2016 – 2022[50] 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-SW. 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.failteireland.ie/FailteIreland/media/WebsiteStructure/Documents/2_Develop_Your_Business/6_Funding/1-FI-Tourism-Investment-Strategy-Final-07-06-16.pdf (Accessed, January 2022)

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

Study Area	Appendix E	Potential for in-combination effect	Conclusion
SAH	See Table E1	**In-combination with other projects** Potential in-combination effects with other projects and options were identified for **Lower River Shannon SAC** from habitat loss, pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for **options SAH-524** (all impacts) and **SAH-225** (all impacts) is concurrent with N69 Listowel Bypass works. There is also the potential for impacts during operation of this project from habitat degradation and water table/availability from **option SAH-225** (see Appendix E, Table E1 for details on specific options). Potential in-combination effects with other projects and options were identified for **Akeragh, Banna and Barrow Harbour SAC** from pollution impacts during construction if the construction phase for **options SAH-038** (all impacts) and **SAH-530** (all impacts) is concurrent with N86 Tralee to An Daingean works (see Appendix E, Table E1 for details on specific options). Potential in-combination effects with other projects and options were identified for **Tralee Bay Complex SPA** from mortality, pollution and disturbance impacts during construction if the construction phase for **options SAH-038** (disturbance and pollution only), **SAH-065** (all impacts) and **SAH-530** (disturbance and pollution only) is concurrent with N86 Tralee to An Daingean, Positioning Tralee as an Economic Driver, Tralee Flood Relief Scheme, Tralee Northern Relief Road, Phase 1 Tralee Town Centre - Rock Street, Russell Street and Bridge Street, Tralee Wastewater Network and MTU Tralee Campus STEM building works. There is also the potential for impacts during operation of some of these various projects from habitat degradation and water table/availability from **option SAH-065** (see Appendix E, Table E1 for details on specific options). Potential in-combination effects with other projects and options were identified for **Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC** from habitat loss, mortality, pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for **options SAH-531** (all impacts), **SAH-530** (all impacts), **SAH-148** (disturbance, spread of invasive non-native species and pollution only), **SAH-170** (all impacts) and **SAH-540** (all impacts) is concurrent with N22 Road Improvement Scheme, N70 Glanbehy Bridge Road Project, Destination Killarney, Smarter Travel Killarney, South Kerry Greenway and Killarney Community Nursing unit works. There is also the potential for impacts during operation of some of these various projects from habitat degradation and water table/availability from **options SAH-531, SAH-530, SAH-148, SAH-170** and **SAH-540** (see Appendix E, Table E1 for details on specific options). Potential in-combination effects with other projects and options were identified for **Iveragh Peninsula SPA** from pollution and disturbance impacts during construction if the construction phase for **options SAH-531** (all impacts) and **SAH-170** (disturbance only) is concurrent with N70 Glanbehy Bridge Road Project, South Kerry	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
		Greenway, Valentia Trans-Atlantic Cable Station and Cahersiveen Town Centre Regeneration Project works (see Appendix E, Table E1 for details on specific options). Potential in-combination effects with other projects and options were identified for **Valencia Harbour/Portmagee Channel SAC** from pollution impacts during construction if the construction phase for **option SAH-531** (all impacts) is concurrent with South Kerry Greenway, Valentia Trans-Atlantic Cable Station and Cahersiveen Town Centre Regeneration Project works (see Appendix E, Table E1 for details on specific option). Potential in-combination effects with other projects and options were identified for **Tralee Bay and Magharees Peninsula, West to Cloghane SAC** from habitat loss, mortality, pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for **options SAH-065** (all impacts), **SAH-530** (disturbance, spread of invasive non-native species and pollution only) and **SAH-138** (pollution only) is concurrent with N86 Tralee to An Daingean, Positioning Tralee as an Economic Driver, Tralee Flood Relief Scheme, Tralee Northern Relief Road, Phase 1 Tralee Town Centre - Rock Street, Russell Street and Bridge Street, Tralee Wastewater Network and MTU Tralee Campus STEM building works. There is also the potential for impacts during operation of some of these various projects from habitat degradation and water table/availability from **option SAH-065** (see Appendix E, Table E1 for details on specific options). Potential in-combination effects with other projects and options were identified for **Dingle Peninsula SPA** from habitat loss, mortality, pollution and disturbance impacts during construction if the construction phase for **options SAH-065** (pollution only)**, SAH-173** (disturbance and pollution only) and **SAH-533** (all impacts) is concurrent with N86 Tralee to An Daingean works (see Appendix E, Table E1 for details on specific options). Potential in-combination effects with other projects and options were identified for **Castlemaine Harbour SAC** from habitat loss, mortality, pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for **options SAH-530** (all impacts), **SAH-170** (pollution only), **SAH-540** (pollution only) and **SAH-173** (pollution only) is concurrent with N22 Road Improvement Scheme, N70 Milltown Bypass Project, N70 Glanbehy Bridge Road Project, N86 Tralee to An Daingean, Destination Killarney, Smarter Travel Killarney and South Kerry Greenway works (see Appendix E, Table E1 for details on specific options). Potential in-combination effects with other projects and options were identified for **Castlemaine Harbour SPA** from pollution impacts during construction if the construction phase for **options SAH-530** (all impacts), **SAH-170** (all impacts), **SAH-173** (all impacts) and **SAH-138** (all impacts) is concurrent with N22 Road Improvement Scheme, N70 Milltown Bypass Project, N70 Glanbehy Bridge Road Project, N86 Tralee to An Daingean and South Kerry Greenway works (see Appendix E, Table E1 for details on specific options). Potential in-combination effects with other projects and options were identified for **Killarney National Park SPA** from habitat loss, pollution and disturbance impacts during construction if the construction phase for **options SAH-530** (all impacts) and **SAH-540** (all impacts) is concurrent with N22 Road Improvement Scheme,	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		Destination Killarney and Smarter Travel Killarney works (see Appendix E, Table E1 for details on specific options). **In-combination between Preferred Approach options** There is potential for construction related in-combination effects from the projects within SAH to **Lower River Shannon SAC** from habitat loss, mortality, habitat degradation, spread of invasive non-native species and disturbance impacts if Preferred Approach **options SAH-524** (all impacts) and **SAH-225** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options). There is potential for construction related in-combination effects from the projects within SAH to **Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA** from disturbance impacts if Preferred Approach **options SAH-524** (all impacts) and **SAH-225** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options). There is potential for construction related in-combination effects from the projects within SAH to **Mount Brandon SAC** from habitat degradation and spread of invasive non-native species impacts if Preferred Approach **options SAH-512** (all impacts) and **SAH-122** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options). There is potential for construction related in-combination effects from the projects within SAH to **Akeragh, Banna and Barrow Harbour SAC** from habitat degradation impacts if Preferred Approach **options SAH-038** (all impacts) and **SAH-530** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options). There is potential for construction related in-combination effects from the projects within SAH to **Tralee Bay Complex SPA** from habitat loss, habitat degradation and disturbance impacts if Preferred Approach **options SAH-038** (all impacts), **SAH-065** (all impacts) and **SAH-530** (habitat degradation and disturbance only) were constructed at the same time (see Appendix E, Table E1 for details on specific options). There is potential for construction and operational related in-combination effects from the projects within SAH to **Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC** from habitat loss, mortality, habitat degradation, spread of invasive non-native species, disturbance and water table/availability impacts if Preferred Approach **options SAH-531** (all impacts), **SAH-530** (all impacts), **SAH-148** (habitat degradation, spread of invasive non-native species, disturbance and water table/availability only), **SAH-170** (all impacts) and **SAH-540** (all impacts) were constructed at the same time and/or during operation (see Appendix E, Table E1 for details on specific options). There is potential for construction related in-combination effects from the projects within SAH to **Iveragh Peninsula SPA** from disturbance impacts if Preferred Approach **options SAH-531** (all impacts) and **SAH-170** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options).	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		There is potential for construction related in-combination effects from the projects within SAH to **Tralee Bay and Magharees Peninsula, West to Cloghane SAC** from habitat degradation, spread of invasive non-native species and disturbance impacts if Preferred Approach **options SAH-065** (all impacts), **SAH-530** (all impacts) and **SAH-138** (habitat degradation only) were constructed at the same time (see Appendix E, Table E1 for details on specific options). There is potential for construction related in-combination effects from the projects within SAH to **Dingle Peninsula SPA** from habitat degradation and disturbance impacts if Preferred Approach **options SAH-065** (habitat degradation only), **SAH-173** (all impacts) and **SAH-533** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options). There is potential for construction related in-combination effects from the projects within SAH to **Castlemaine Harbour SAC** from habitat degradation impacts if Preferred Approach **options SAH-530** (all impacts), **SAH-170** (all impacts), **SAH-540** (all impacts) and **SAH-173** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options). There is potential for construction related in-combination effects from the projects within SAH **Killarney National Park SPA** from habitat loss, habitat degradation and disturbance impacts if Preferred Approach **options SAH-530** (all impacts) and **SAH-540** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options). There is potential for construction related in-combination effects from the projects within SAH to **Castlemaine Harbour SPA** from habitat degradation impacts if Preferred Approach **options SAH-530** (all impacts), **SAH-170** (all impacts), **SAH-173** (all impacts) and **SAH-138** (all impacts) were constructed at the same time (see Appendix E, Table E1 for details on specific options).	
SAI	See Table E2	**In-combination with other projects** Potential in-combination effects with other projects and options were identified for **Mullaghanish to Musheramore Mountains SPA** from disturbance impacts during construction if the construction phase for **option SAI-011** (all impacts) is concurrent with Coláiste Íosagáin Campus and N22 Baile Bhuirne to Macroom Road Development works (see Appendix E, Table E2 for details on specific options). Potential in-combination effects with other projects and options were identified for **The Gearagh SAC** from pollution impacts during construction if the construction phase for **options SAI-060** (all impacts) and **SAI-771** (all impacts) is concurrent with Coláiste Íosagáin Campus works (see Appendix E, Table E2 for details on specific options). Potential in-combination effects with other projects and options were identified for **The Gearagh SPA** from pollution impacts during construction if the construction phase for **options SAI-060** (all impacts) and **SAI-771**	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
		(all impacts) is concurrent with Coláiste Íosagáin Campus works (see Appendix E, Table E2 for details on specific options). Potential in-combination effects with other projects and options were identified for **Beara Peninsula SPA** from disturbance impacts during construction if the construction phase for **options SAI-480** (all impacts), **SAI-768** (all impacts) and **SAI-960** (all impacts) is concurrent with Dursey Island Cable Car and Visitor Centre works (see Appendix E, Table E2 for details on specific options). Potential in-combination effects with other projects and options were identified for **Roaringwater Bay and Islands SAC** from pollution and disturbance impacts during construction if the construction phase for **options SAI-498** (pollution only), **SAI-955** (pollution only) and **SAI-962** (all impacts) is concurrent with Skibbereen Community Hospital works (see Appendix E, Table E2 for details on specific options). Potential in-combination effects with other projects and options were identified for **Kenmare River SAC** from pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for **options SAI-630** (all impacts), **SAI-643** (pollution only), **SAI-645** (pollution only), **SAI-652** (pollution only), **SAI-768** (all impacts), **SAI-923** (all impacts) and **SAI-960** (all impacts) is concurrent with Dursey Island Cable Car and Visitor Centre (pollution impacts only), Gteic Uíbh Ráthaigh and N70 Sneem to Blackwater Bridge works (see Appendix E, Table E2 for details on specific options). Potential in-combination effects with other projects and options were identified for **Ballinskelligs Bay and Inny Estuary SAC** from pollution impacts during construction if the construction phase for **option SAI-923** (all impacts) is concurrent with Gteic Uíbh Ráthaigh works (see Appendix E, Table E2 for details on specific options). Potential in-combination effects with other projects and options were identified for **Blackwater River (Cork/Waterford) SAC** from pollution, spread of invasive non-native species and disturbance impacts during construction if the construction phase for **option SAI-949** (all impacts) is concurrent with N/M20 Cork to Limerick Road Improvement Scheme works. There is also the potential for impacts during operation of this project from habitat degradation and water table/availability from **option SAI-949** (see Appendix E, Table E2 for details on specific options). Potential in-combination effects with other projects and options were identified for **Cork Harbour SPA** from pollution impacts during construction if the construction phase for **options SAI-963** (all impacts) and **SAI-971** (all impacts) is concurrent with Carrigaline Western Relief Road, Blackpool FRS, Glashaboy FRS, M/N28 Cork to Ringaskiddy Road, Remediation of Haulbowline Island, Schemes within Cork City, Midleton Flood Relief Scheme, Midleton Main Street works, Midleton Permeability package of proposals, Midleton Water Supply Scheme, N/M20 Cork to Limerick Road Improvement Scheme and N25 Carrigtohill to Midleton Upgrade Scheme works (see Appendix E, Table E2 for details on specific options).	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		Potential in-combination effects with other projects and options were identified for **Great Island Channel SAC** from pollution impacts during construction if the construction phase for **option SAI-971** (all impacts) is concurrent with Carrigaline Western Relief Road, Blackpool FRS, Glashaboy FRS, M/N28 Cork to Ringaskiddy Road, Remediation of Haulbowline Island, Schemes within Cork City, Midleton Flood Relief Scheme, Midleton Main Street works, Midleton Permeability package of proposals, Midleton Water Supply Scheme, N/M20 Cork to Limerick Road Improvement Scheme and N25 Carrigtohill to Midleton Upgrade Scheme works (see Appendix E, Table E2 for details on specific options). Potential in-combination effects with other projects and options were identified for **Sovereign Islands SPA** from pollution impacts during construction if the construction phase for **option SAI-971** (all impacts) is concurrent with Carrigaline Western Relief Road, Bandon Water Main and Kinsale Community Hospital works (see Appendix E, Table E2 for details on specific options). **In-combination between Preferred Approach options** There is potential for construction related in-combination effects from the projects within SAI to **The Gearagh SAC** from habitat degradation impacts if Preferred Approach **options SAI-060** (all impacts) and **SAI-771** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **The Gearagh SPA** from habitat degradation impacts if Preferred Approach **options SAI-060** (all impacts) and **SAI-771** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Cork Harbour SPA** from habitat degradation impacts if Preferred Approach **options SAI-963** (all impacts) and **SAI-971** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Ballymacoda (Clonpriest and Pilmore) SAC** from habitat degradation impacts if Preferred Approach **options SAI-877** (all impacts), **SAI-949** (all impacts) and **SAI-950** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Ballymacoda Bay SPA** from habitat degradation impacts if Preferred Approach **options SAI-877** (all impacts), **SAI-949** (all impacts) and **SAI-950** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Barley Cove to Ballyrisode Point SAC** from habitat degradation impacts if Preferred Approach **options SAI-457** (all impacts), **SAI-498** (all impacts) and **SAI-784** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options).	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		There is potential for construction related in-combination effects from the projects within SAI to **Caha Mountains SAC** from habitat degradation, spread of invasive non-native species and disturbance impacts if Preferred Approach **options SAI-468** (all impacts), **SAI-652** (habitat degradation only) and **SAI-955** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Glengarriff Harbour and Woodland SAC** from habitat degradation, spread of invasive non-native species and disturbance impacts if Preferred Approach **options SAI-468** (all impacts) and **SAI-955** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Beara Peninsula SPA** from habitat loss, habitat degradation, spread of invasive non-native species and disturbance impacts if Preferred Approach **options SAI-480** (all impacts), **SAI-768** (all impacts) and **SAI-960** (habitat degradation, disturbance and spread of invasive non-native species only) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Roaringwater Bay and Islands SAC** from habitat degradation impacts if Preferred Approach **options SAI-498** (all impacts), **SAI-955** (all impacts) and **SAI-962** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Kenmare River SAC** from habitat degradation, spread of invasive non-native species and disturbance impacts if Preferred Approach **options SAI-630** (all impacts), **SAI-643** (habitat degradation only), **SAI-645** (habitat degradation only), **SAI-652** (habitat degradation only), **SAI-768** (all impacts), **SAI-923** (all impacts) and **SAI-960** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC** from habitat degradation, spread of invasive non-native species and disturbance impacts if Preferred Approach **options SAI-643** (all impacts) and **SAI-923** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Courtmacsherry Estuary SAC** from habitat degradation impacts if Preferred Approach **options SAI-779** (all impacts) and **SAI-971** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on specific options). There is potential for construction related in-combination effects from the projects within SAI to **Courtmacsherry Bay SPA** from habitat degradation impacts if Preferred Approach **options SAI-779** (all impacts) and **SAI-971** (all impacts) were constructed at the same time (see Appendix E, Table E2 for details on	

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		specific options).	
SAJ	See Table E3	**In-combination with other 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 SAJ-291** (pollution only), **SAJ-223** (pollution only), **SAJ-272** (pollution only), **SAJ-128** (all impacts), **SAJ-188** (pollution only), **SAJ-262** (pollution only), **SAJ-162** (pollution only), **SAJ-167**(pollution only), **SAJ-281** (pollution only), **SAJ-531** (all impacts), **SAJ-601** (pollution only), **SAJ-597** (all impacts), **SAJ-520** (pollution only), **SAJ-611** (all impacts), **SAJ-627** (all impacts), **SAJ-609** (mortality, pollution, spread of invasive non-native species and disturbance only), **SAJ-595** (all impacts), **SAJ-616** (pollution only), **SAJ-617** (pollution only), **SAJ-614** (mortality, pollution, spread of invasive non-native species and disturbance only), **SAJ-613** (pollution only), **SAJ-629** (all impacts), **SAJ-630** (pollution and spread of invasive non-native species only) and **SAJ-631**(all impacts) is concurrent with N/M20 Cork to Limerick Road Improvement Scheme, N72/N73 Mallow Relief Road, Cork Line Level Crossings (no invasive non-native species impacts with this scheme), Mallow Town Regeneration, Cois Abhainn, Greencloyne, Youghal, Youghal Community Hospital (St Raphael's), Youghal Public Library, St Joseph's Community Hospital, Millstreet, Kanturk Community Hospital, Mallow Wastewater Treatment Plant and Ballydesmond Village Public Realm and Placemaking Enhancement works. There is also the potential for impacts during operation of some of these various projects from habitat degradation and water table/availability from **options SAJ-128, SAJ-531, SAJ-597, SAJ-627, SAJ-609, SAJ-595, SAJ-614, SAJ-629, SAJ-630** and **SAJ-631** (see Appendix E, Table E3 for details on specific options). Potential in-combination effects with other projects and options were identified for **Blackwater Estuary SPA** from pollution and disturbance impacts during construction if the construction phase for **options SAJ-291** (pollution only), **SAJ-223** (pollution only), **SAJ-128** (pollution only), **SAJ-611** (all impacts) and **SAJ-609** (pollution only) is concurrent with Cois Abhainn, Greencloyne, Youghal, Youghal Community Hospital (St Raphael's) and Youghal Public Library works (see Appendix E, Table E3 for details on specific options). Potential in-combination effects with other projects and options were identified for **Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA** from habitat loss and disturbance impacts during construction if the construction phase for **option SAJ-600** (all impacts) is concurrent with Ballydesmond Village Public Realm and Placemaking Enhancement works (see Appendix E, Table E3 for details on specific options). **In-combination between Preferred Approach options** There is potential for construction and operational related in-combination effects from the projects within SAJ to **Blackwater River (Cork/Waterford) SAC** from habitat loss, mortality, habitat degradation, spread of invasive non-native species, disturbance and water table/availability impacts if Preferred Approach **options SAJ-291** (habitat degradation only), **SAJ-223** (habitat degradation only), **SAJ-272** (habitat degradation only), **SAJ-128**	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
		(all impacts), **SAJ-188** (habitat degradation only), **SAJ-262** (habitat degradation only), **SAJ-162** (habitat degradation only), **SAJ-167** (habitat degradation only), **SAJ-281** (habitat degradation only), **SAJ-531** (all impacts), **SAJ-601** (habitat degradation only), **SAJ-597** (all impacts), **SAJ-520** (habitat degradation only), **SAJ-611** (habitat loss, mortality, habitat degradation, spread of invasive non-native species and disturbance only), **SAJ-627** (all impacts), **SAJ-609** (mortality, habitat degradation, spread of invasive non-native species, disturbance and water table/availability only), **SAJ-595** (all impacts), **SAJ-616** (habitat degradation only), **SAJ-617** (habitat degradation only), **SAJ-614** (mortality, habitat degradation, spread of invasive non-native species, disturbance and water table/availability only), **SAJ-613** (habitat degradation only), **SAJ-629** (all impacts), **SAJ-630** (habitat degradation, spread of invasive non-native species and water table/availability only), and **SAJ-631** (all impacts) were constructed at the same time and/or during operation (see Appendix E, Table E3 for details on specific options). There is potential for construction related in-combination effects from the projects within SAJ to **Blackwater Estuary SPA** from habitat degradation impacts if Preferred Approach **options SAJ-291** (all impacts), **SAJ-223** (all impacts), **SAJ-128** (all impacts), **SAJ-611** (all impacts) and **SAJ-609** (all impacts) were constructed at the same time (see Appendix E, Table E3 for details on specific options). There is potential for construction related in-combination effects from the projects within SAJ to **Blackwater Callows SPA** from habitat degradation and disturbance impacts if Preferred Approach **options SAJ-281** (habitat degradation only), **SAJ-531** (habitat degradation only), **SAJ-601** (habitat degradation only), **SAJ-597** (habitat degradation only), **SAJ-627** (all impacts), **SAJ-595** (all impacts), **SAJ-617** (habitat degradation only), **SAJ-614** (all impacts) and **SAJ-613** (habitat degradation only) were constructed at the same time (see Appendix E, Table E3 for details on specific options). There is potential for construction related in-combination effects from the projects within SAJ to **Lower River Shannon SAC** from habitat degradation impacts if Preferred Approach **options SAJ-600** (all impacts) and **SAJ-628** (all impacts) were constructed at the same time (see Appendix E, Table E3 for details on specific options).	
SW Region	See Table E4	**In-combination between Study Areas within the SW region** There are potential in-combination effects between options across Study Areas but only if construction/operation of options progressed concurrently as follows: • On **Ballinskelligs Bay and Inny Estuary SAC** from options within **SAH** and **SAI**. There is potential for in-combination impacts from habitat degradation if construction of options within these SAs is concurrent. • On **Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC** from options within **SAH** and **SAI**. There is potential for in-combination impacts from habitat degradation, disturbance and spread of invasive non-native species if construction of options within these SAs is concurrent, and during	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-combination with other plans or projects.

Study Area	Appendix E	Potential for in-combination effect	Conclusion
		operation from water table/availability and habitat degradation impacts. • On **Blackwater River (Cork/Waterford) SAC** from options within **SAH, SAI** and **SAJ**. There is potential for in-combination impacts from habitat degradation (all SAs), disturbance (SAI and SAJ only) and spread of invasive non-native species (SAI and SAJ only) if construction of options within these SAs is concurrent, and during operation from water table/availability (SAI and SAJ only) and habitat degradation impacts (SAI and SAJ only). • On **Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA** from options within **SAH** and **SAJ**. There is potential for in-combination impacts from disturbance if construction of options within these SAs is concurrent. • On **Lower River Shannon SAC** from options within **SAH** and **SAJ**. 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. • On **Blackwater Estuary SPA** from options within **SAI** and **SAJ**. There is potential for in-combination impacts from habitat degradation and disturbance if construction of options within these SAs is concurrent.	
SW and EM Regions	See Table E5	**In-combination between the 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 **Lower River Suir SAC** from options within **SW** and **EM**. There is potential for in-combination impacts from habitat degradation if construction of options within these regions is concurrent. • On **Blackwater River (Cork/Waterford) SAC** from options within **SW** and **EM**. There is potential for in-combination impacts from habitat degradation 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 **SW** and **EM**. There is potential for in-combination impacts from disturbance if construction of options within these regions is concurrent. • On **Lower River Shannon SAC** from options within **SW** and **EM**. 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 Shannon and River Fergus Estuaries SPA** from options within **SW** and **EM**. There is potential for in-combination impacts from habitat degradation if construction of options within these regions is concurrent.	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.

8

South West Summary and Conclusion

8.1 South West Region Summary

8.1.1 In-combination Assessment (SW 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 SW regional level. In summary, potential in-combination effects were identified within the SW region between Preferred Approaches, between Preferred Approaches and other (non-Irish Water) 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 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-SW.

Table 8.1 – European sites with potential in-combination effects within the SW 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)
Akeragh, Banna and Barrow Harbour SAC	Akeragh, Banna and Barrow Harbour SAC	Ballinskelligs Bay and Inny Estuary SAC
Ballinskelligs Bay and Inny Estuary SAC	Ballymacoda (Clonpriest and Pilmore) SAC	Blackwater River (Cork/Waterford) SAC
Beara Peninsula SPA	Ballymacoda Bay SPA	Blackwater Estuary SPA
Blackwater River (Cork/Waterford) SAC	Barley Cove to Ballyrisode Point SAC	Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC
Blackwater Estuary SPA	Beara Peninsula SPA	Lower River Shannon SAC
Castlemaine Harbour SAC	Blackwater River (Cork/Waterford) SAC	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA
Castlemaine Harbour SPA	Blackwater Callows SPA	
Cork Harbour SPA	Blackwater Estuary SPA	
Dingle Peninsula SPA	Caha Mountains SAC	
Great Island Channel SAC	Castlemaine Harbour SAC	
Iveragh Peninsula SPA	Castlemaine Harbour SPA	
Kenmare River SAC	Cork Harbour SPA	
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC	Courtmacsherry Estuary SAC	
Killarney National Park SPA	Courtmacsherry Bay SPA	
Lower River Shannon SAC	Dingle Peninsula SPA	
Mullaghanish to Musheramore Mountains SPA	Glengarriff Harbour and Woodland SAC	
Roaringwater Bay and Islands SAC	Iveragh Peninsula SPA	
Sovereign Islands SPA	Kenmare River SAC	
Stack's to Mullaghareirk Mountains, West Limerick Hills and	Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC	

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)
Mount Eagle SPA	Killarney National Park SPA	
The Gearagh SAC	Lower River Shannon SAC	
The Gearagh SPA	Mount Brandon SAC	
Tralee Bay and Magharees Peninsula, West to Cloghane SAC	Roaringwater Bay and Islands SAC	
Tralee Bay Complex SPA	Stack's to Mullaghareirk Mountains, West Limerick Hills and Mount Eagle SPA	
Valencia Harbour/Portmagee Channel SAC	The Gearagh SAC	
	The Gearagh SPA	
	Tralee Bay and Magharees Peninsula, West to Cloghane SAC	
	Tralee Bay Complex SPA	

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

In-combination effects between Regional Groups (Preferred Approaches only)
Blackwater River (Cork/Waterford) SAC
Lower River Shannon SAC
Lower River Suir SAC
River Shannon and River Fergus Estuaries 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-SW 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-SW.

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