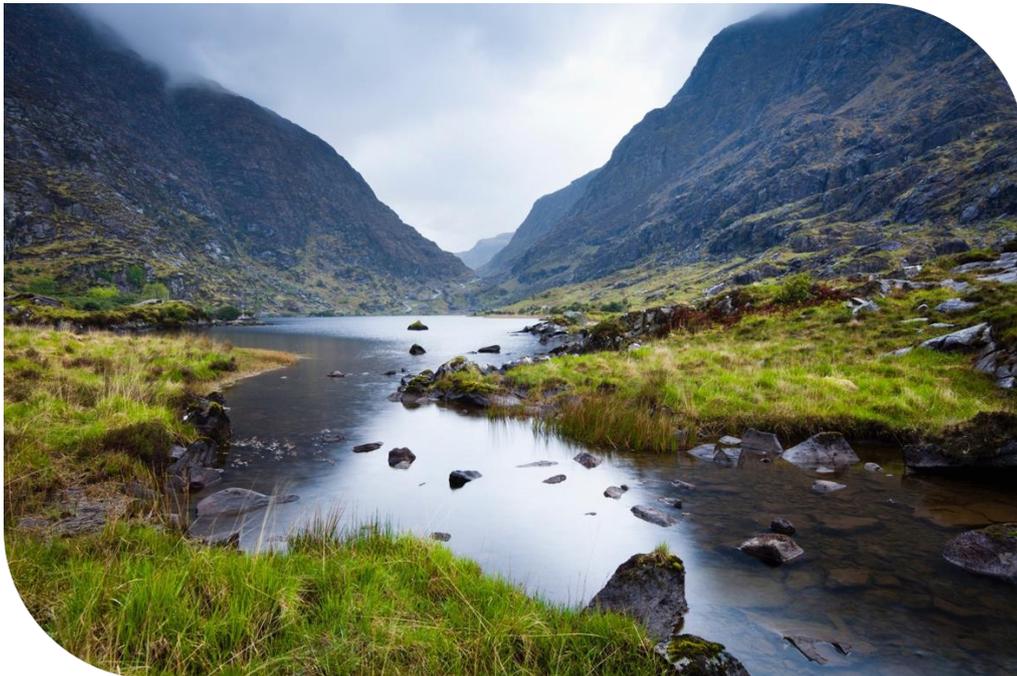


Spring 2023



Regional Water Resources Plan –South West Appendix 2 Study Area I Technical Report



Tionscadal Éireann
Project Ireland
2040

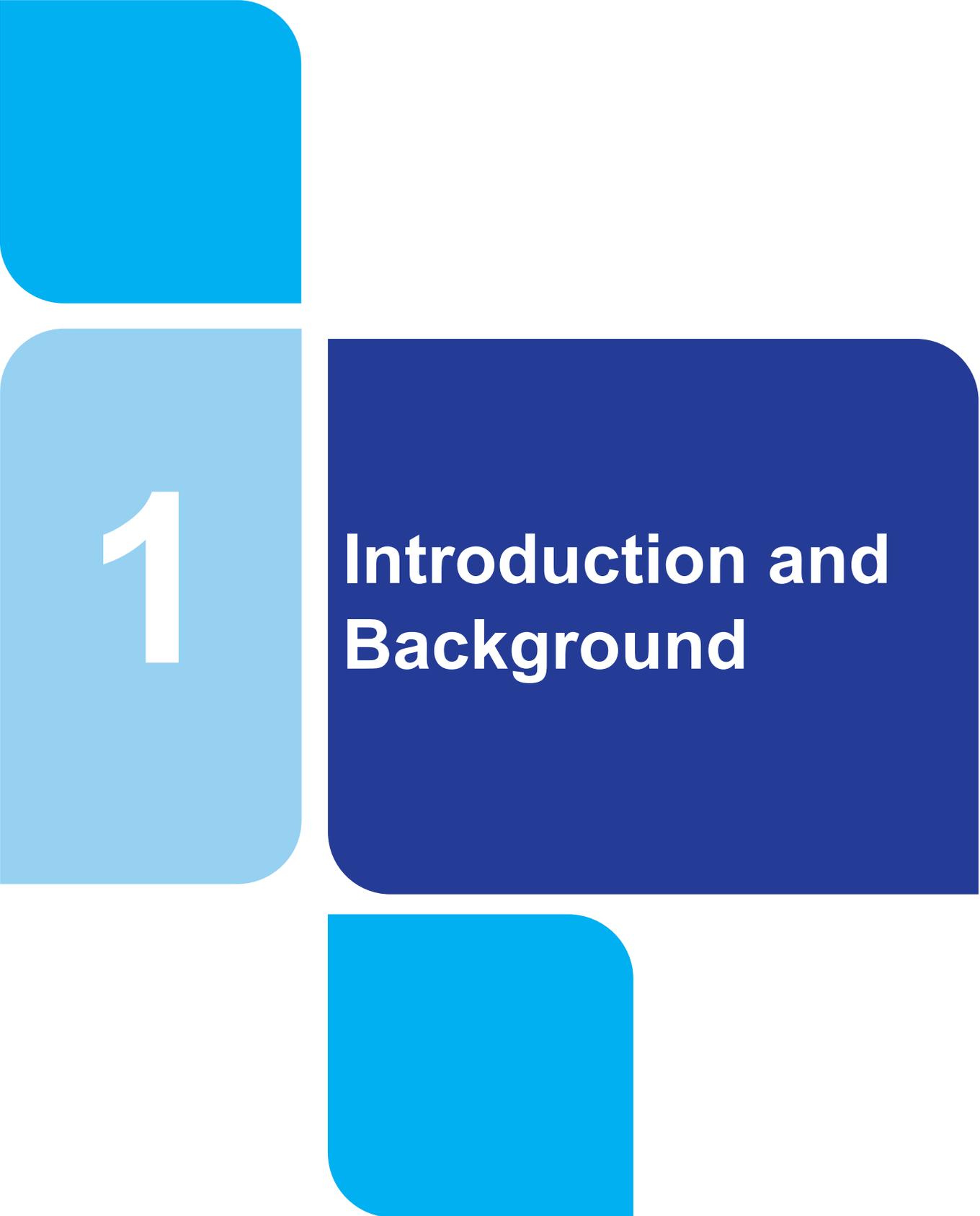
Data disclaimer: This document uses best available data at time of writing. As data relating to population forecasts and trends are based on information gathered before the Covid-19 Pandemic, monitoring and feedback will be used to capture any updates. The National Water Resources Plan (NWRP) will also 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 Regional Plan, 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 Irish Water 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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1

Introduction and Background

1 Introduction – Study Area I – Cork/South Kerry

This is the Technical Report for Study Area I which applies the Options Assessment Methodology, as set out in the National Water Resources Plan Framework Plan (NWRP-FP), the final version of which was reviewed by the authors of this Technical Report prior to finalisation of this Technical Report. This document should be reviewed in conjunction with the Framework Plan and the Regional Water Resources Plan - South West (RWRP-SW), which explain key concepts and terminology used throughout the report.

This Study Area includes 89 water resource zones located in County Cork and County Kerry. This Technical Report includes:

- The summary of Identified Need in this Study Area including Quality, Quantity, Reliability and Sustainability
- Options considered within the Study Area
- The range of approaches to resolve Identified Need
- Development of an Outline Preferred Approach for the Study Area; and
- The adaptability of our Preferred Approach.

The Preferred Approach for this Study Area feeds into the regional Preferred Approach detailed in RWRP-SW.

1.1 Summary of Our Options Assessment Methodology

In Chapter 8 of the Framework Plan, we described the Option Assessment Methodology that will be used to develop a national programme of proposed solutions for all of our water supplies. The objective of these solutions is to resolve the needs identified through the Supply Demand Balance (SDB), Water Quality, Reliability and Sustainability assessments. These needs will be discussed in further detail in this report. In the RWRP-SW, we apply this methodology to the South West Region shown in Figure 1.1.

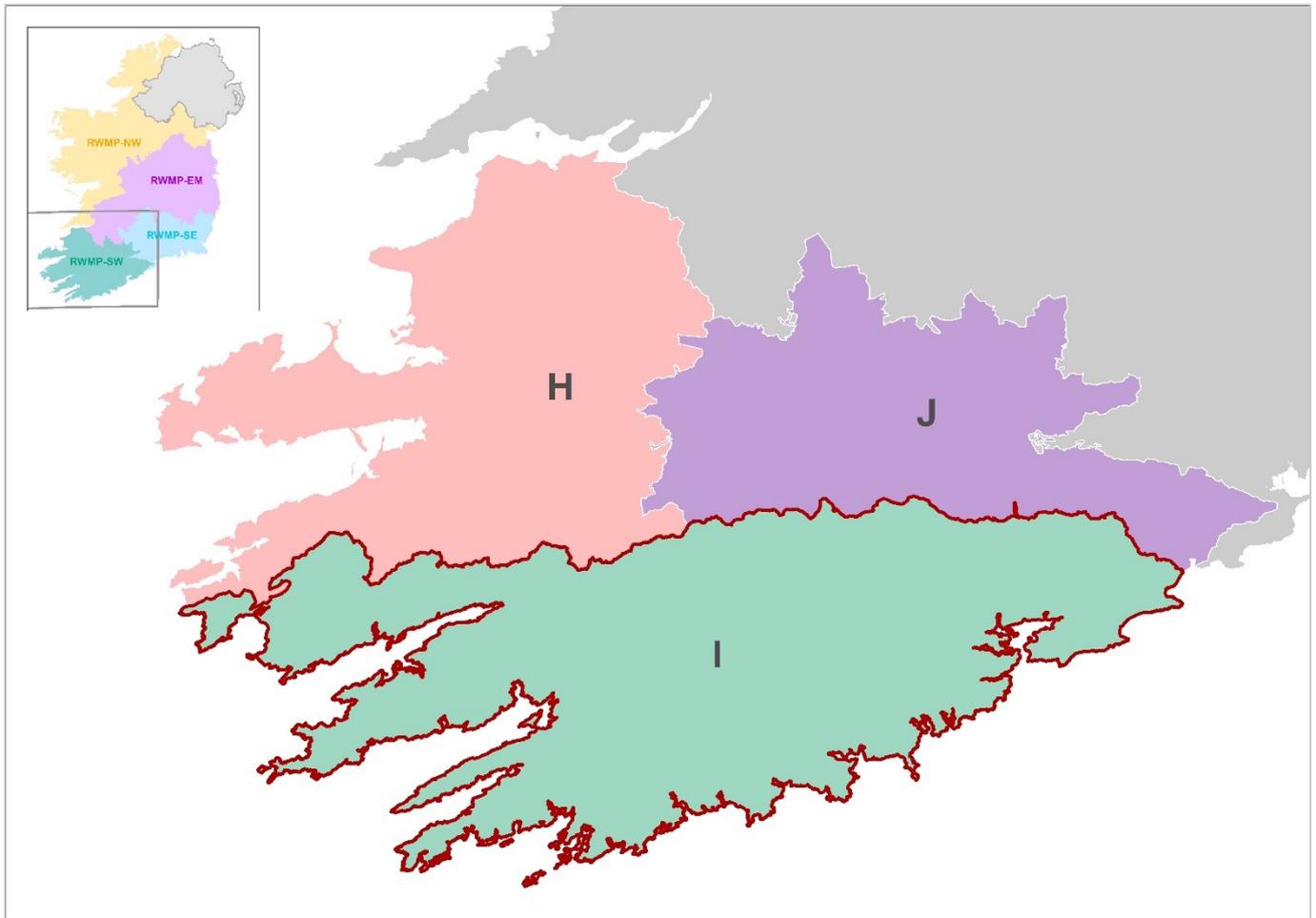


Figure 1.1 Overview of Study Areas within the South West Region

As outlined in Section 1.9.4 of the Framework Plan, the regional boundaries have been delineated for the purpose of delivering the National Water Resources Plan. As a National Plan, sources outside the delivery region may be considered to meet need within a particular region.

This Technical Report is for Study Area I (SAI), which consists of 89 individual water resource zones (WRZs). Within this Study Area, the Preferred Approach has been developed following the process shown in Figure 1.2 and as outlined in Section 8.3 of the Framework Plan.

In this document, Option codes are labelled using the following naming convention: SAX-00X

- SAX refers to the Study Area within which the option is located.
- 00X refers to the individual option number.
- Any references to TG2 refers the South West Region (Regional Group 2).

It should be noted that assessments and preferred approaches and solutions at this stage are at a Plan Level. Environmental impacts and costing of projects are further reviewed at Project Level. No statutory consent or funding consent is conferred by inclusion in the national plan. Any projects that are progressed following this plan will require individual environmental assessments, including Environmental Impact Assessment and Appropriate Assessment (as required), in support of planning applications (where a project requires planning permission) or in support of licencing applications (for example, for new abstractions). Any such applications will also be subject to public consultation.

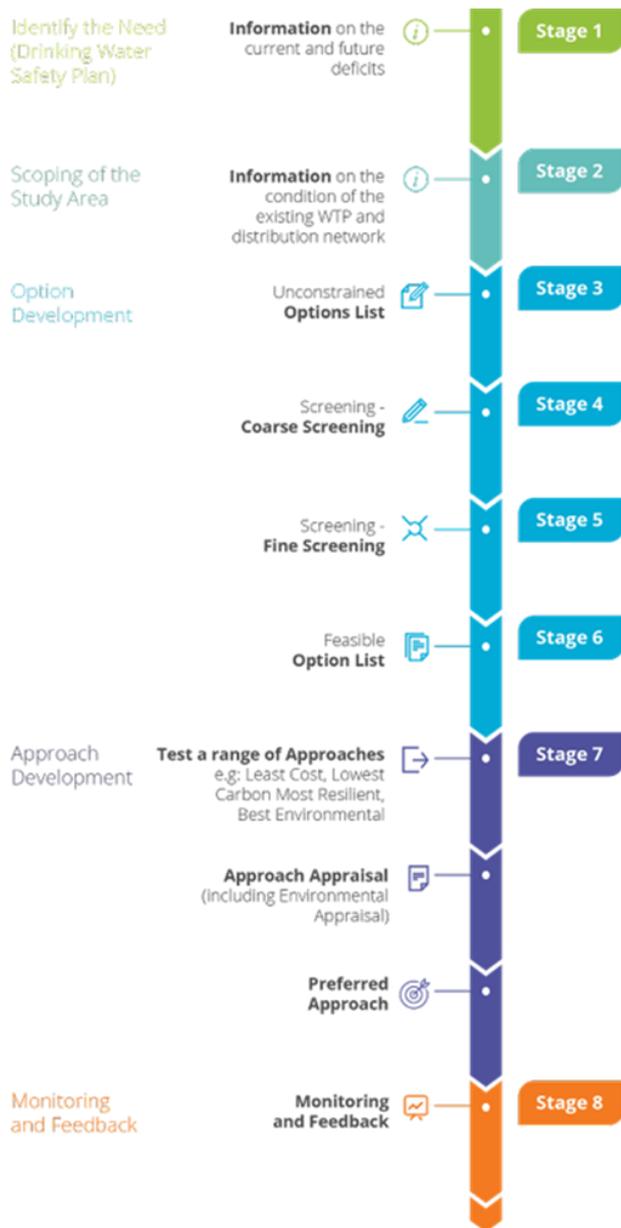


Figure 1.2 Option Assessment Methodology Process

1.2 Introduction to the Study Area

SAI consists of 89 WRZs supplying a population of approximately 390,000 people via approximately 3,776 kilometres of distribution network. 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 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 Study Area is summarised in Figure 1.3. and Table 1.1.

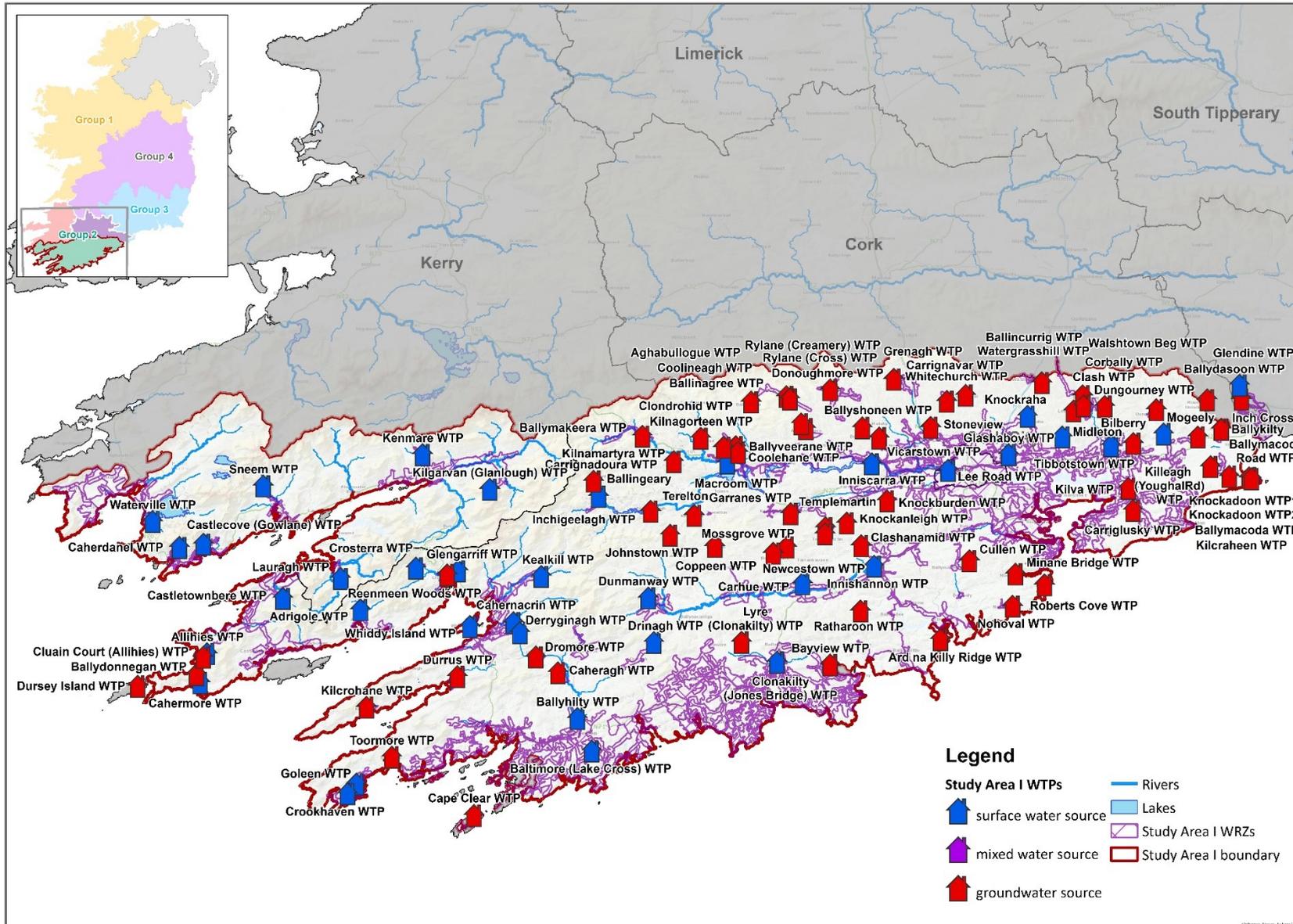


Figure 1.3 SAI Cork Water Supply Study Area

The sources of water supply include 44 surface water and 66 groundwater sources (91 groundwater abstractions) in SAI.

Regarding surface water availability in SAI, the Study Area stretches across three WFD catchments: The Lee, Cork Harbour and Youghal Bay (HA 19) in the northeast; the Bandon-Ilen (HA 20) in the south; and the Dumanus-Bantry-Kenmare (HA 21) 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 supplies Inniscarra WTP (the third biggest plant in the country); and an abstraction further downstream directly from River Lee 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 Owenacurra River (Tibbotstown and Middleton 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 (under Freshwater pearl mussel regulations (S.I. 296 2009)) - 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 (ORS) 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 (Rkd 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 4,500 – 6,000 m³/d.

There are a number of locally important sand and gravel aquifers (Lg) 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 (6) ‘excellent’ wells abstracting from the gravels at Brinny, and one ‘good’ well with a yield of 327 m³/d. The majority of the smaller abstractions take place from the sandstones, producing yields averaging 120 – 350m³/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 (>2160 m³/d).

Table 1.1 SAI Study Area Summary

Cork	Total Population	389,764	Total Network Length (km)	3,776	Number of Water Resource Zones	89	
Counties in Study Area	Cork						
Principle Settlements	Cork city and suburbs, Carrigaline, Cobh, Midleton, Passage West, Bandon, Carrigtwohill, Clonakilty, Killumney, Kinsale, Cloyne, Tower, Skibbereen, Macroom, Aghada-Farsid-Rostellan, Bantry, Fountainstown, Castlemartyr, Blarney, Crosshaven-Churchbay, Kenmare, Ballygarvan, Dunmanway, Mogeely, Innishannon, Castletownbere, Courtmacsherry, Watergrasshill, Shanagarry, Ringaskiddy-Loughbeg, Riverstick, Ballycotton, Knockglass, Rosscarbery, Saleen, Killeagh						
Number of Water Sources	110	Surface Water Sources	44	Groundwater Sources	66		
Water Treatment Plant	Source	Population	WTP Capacity (m³/day)	Quality	Quantity	Reliability	Potential Sustainability
Kilgarvan (Glanlough) WTP	Coomclogherane Lake	815	576	●	●	●	●
Lauragh WTP	Ahadav stream	72	72	●	●	●	●
Waterville WTP	Lough Currane, Finglas River, Finglas River (Tributary)	1,330	1,992	●	●	●	●
Kenmare WTP	Lough Eirk (stream)	2,898	1,200	●	●	●	●
Sneem WTP	Dromtine Lough	446	576	●	●	●	●
Castlecove (Gowlane) WTP	Gowlane Stream & Gowla River (Behaghane)	197	600	●	●	●	●
Caherdaniel WTP	Coonmahorna West River	146	600	●	●	●	●
Lee Road WTP	River Lee	93,151	36,000	●	●	●	●

Kilva WTP	Groundwater	9,741	7,000	●	●	●	●
Kealkill WTP	Owengar River	714	267	●	●	●	●
Reenmeen Woods WTP	Groundwater	33	18	●	●	●	●
Ballyverane WTP	Groundwater	10	5	●	●	●	●
Kilnagorteen WTP	Groundwater	19	18	●	●	●	●
Coolyhan WTP	Groundwater	70	26	●	●	●	●
Macroom WTP	Sullane River	4,097	2,200	●	●	●	●
Ballyhilty WTP	River Ilen	6,614	8,267	●	●	●	●
Ballyshoneen WTP	Groundwater	74	12	●	●	●	●
Knockburden WTP	Groundwater	71	18	●	●	●	●
Cluain Court (Allihies) WTP	Groundwater	13	10	●	●	●	●
Johnstown WTP	Groundwater	18	15	●	●	●	●
Coppeen WTP	Groundwater	45	9	●	●	●	●
Ballincurrig WTP	Groundwater	243	96	●	●	●	●
Mogeely WTP	Kiltha River	2,944	1,150	●	●	●	●
Tibbotstown WTP	Tibbotstown Reservoir &	9,273	7,200	●	●	●	●

	Owenacurra River						
Midleton WTP	Owenacurra River	8,458	5,500	●	●	●	●
Carriglusky WTP	Groundwater	3,475	2,700	●	●	●	●
Bilberry WTP	Groundwater	17	15	●	●	●	●
Cape Clear WTP	Groundwater	124	300	●	●	●	●
Lyre (Clonakilty) WTP	Groundwater	42	20	●	●	●	●
Clonakilty (Jones Bridge) WTP	Arideen River, Jones Bridge	13,584	8,600	●	●	●	●
Bayview WTP	Groundwater	23	10	●	●	●	●
Ratharoon WTP	Groundwater	11	6	●	●	●	●
Clashanamid WTP	Groundwater	18	12	●	●	●	●
Carhue WTP	Bandon River	9,188	4,920	●	●	●	●
Knockanleigh WTP	Groundwater	13	8	●	●	●	●
Killeagh (Youghal Rd) WTP	Groundwater	1,039	115	●	●	●	●
Ballymacoda Road WTP	Groundwater	1,039	115	●	●	●	●
Ballykilty WTP	Groundwater	124	42	●	●	●	●
Minane Bridge WTP	Groundwater	152	60	●	●	●	●

Innishannon WTP	Innishannon	20,162	11,000	●	●	●	●
Inniscarra WTP	Inniscarra	139,822	90,000	●	●	●	●
Glashaboy WTP	Glashaboy River	23,885	22,730	●	●	●	●
Knockraha WTP	Coolguerisk, 2x Butlerstown River Tributary	5,394	1,700	●	●	●	●
Watergrasshill WTP	Groundwater	374	100	●	●	●	●
Garranes WTP	Groundwater	39	20	●	●	●	●
Templemartin WTP	Groundwater	36	30	●	●	●	●
Kilnamartyra WTP	Groundwater	91	78	●	●	●	●
Rylane (Cross) WTP	Groundwater	387	168	●	●	●	●
Rylane (Creamery) WTP	Groundwater	387	168	●	●	●	●
Ballinagree WTP	Groundwater	182	42	●	●	●	●
Clondrohid WTP	Groundwater	189	55	●	●	●	●
Ballymakeera WTP	Groundwater	666	360	●	●	●	●
Croterra WTP	Barley Lake	33	72	●	●	●	●
Glengarriff WTP	Barony River	360	363	●	●	●	●
Aghabullogue WTP	Groundwater	164	36	●	●	●	●

Coolineagh WTP	Groundwater	6	5	●	●	●	●
Donoughmore WTP	Groundwater	905	504	●	●	●	●
Grenagh WTP	Groundwater	955	330	●	●	●	●
Vicarstown WTP	Groundwater	32	35	●	●	●	●
Stoneview WTP	Groundwater	113	50	●	●	●	●
Whitechurch WTP	Groundwater	691	130	●	●	●	●
Carrignavar WTP	Groundwater	517	190	●	●	●	●
Clash WTP	Groundwater	40	22	●	●	●	●
Corbally WTP	Groundwater	206	40	●	●	●	●
Walshstown Beg WTP	Groundwater	61	15	●	●	●	●
Dungourney WTP	Groundwater	132	55	●	●	●	●
Ballymacoda WTP	Groundwater	358	120	●	●	●	●
Kilcraheen WTP	Groundwater	40	14	●	●	●	●
Knockadoon WTP 2	Groundwater	134	60	●	●	●	●
Knockadoon WTP 1	Groundwater	134	60	●	●	●	●
Drinagh WTP	Curraghlicky Lake	242	246	●	●	●	●

Dursey Island WTP	Groundwater	3	20	●	●	●	●
Cahermore WTP	Cahermore River	15	24	●	●	●	●
Ballydonegan WTP	Groundwater	73	20	●	●	●	●
Allihies WTP	Allihies Impoundment	73	80	●	●	●	●
Castletownbere WTP	Glenbeg	2,341	3,187	●	●	●	●
Adrigole WTP	Clashduff River	237	181	●	●	●	●
Whiddy Island WTP	Kilmore lakes	20	66	●	●	●	●
Cahernacrin WTP	Inchilough lake, Drombrow lake	2,176	1,330	●	●	●	●
Derryginagh WTP	Lough Bofinna Intake	1,715	1,470	●	●	●	●
Dromore WTP	Groundwater	73	70	●	●	●	●
Caheragh WTP	Groundwater	174	100	●	●	●	●
Durrus WTP	Groundwater	367	188	●	●	●	●
Kilcrohane WTP	Groundwater	149	91	●	●	●	●
Crookhaven WTP	Crookhaven Impoundment (Arduslough)	66	175	●	●	●	●
Goleen WTP	Goleen Intake	137	108	●	●	●	●
Toomore WTP	Groundwater	34	20	●	●	●	●

Baltimore (Lake Cross) WTP	Lough Abisdealy	1,295	1600	●	●	●	●
Cullen WTP	Groundwater	10	10	●	●	●	●
Ard Na Killy Ridge WTP	Groundwater	28	18	●	●	●	●
Nohoval WTP	Groundwater	125	30	●	●	●	●
Roberts Cove WTP	Groundwater	55	46	●	●	●	●
Mossgrove WTP	Groundwater	17	12	●	●	●	●
Newcestown WTP	Groundwater	102	45	●	●	●	●
Dunmanway WTP	Coolkellure lake	2,049	1170	●	●	●	●
Carrignadoura WTP	Groundwater	105	120	●	●	●	●
Ballingeary WTP	Bunsheelin	243	114	●	●	●	●
Inchigeelagh WTP	Groundwater	140	120	●	●	●	●
Ballydasoon WTP	Groundwater	71	50	●	●	●	●
Glendine WTP	Tourig River Source, Glendine River	8,125	3,000	●	●	●	●
Inch Cross WTP	Groundwater	26	11	●	●	●	●
Tarelton WTP	Groundwater	9	20	●	●	●	●

Score	Irish Water Asset Standard Assessment	Priority
●	Low Risk	Low Priority Asset
●	Medium Risk	Priority 2 Asset
●		
●	High Risk	Priority 1 Asset



2

Scoping the Study Area

2 Scoping the Study Area

In this chapter we summarise the current and future issues with water supplies in Study Area I, in terms of water quality, quantity, reliability and sustainability.

To identify the issues and corresponding need with the water supplies in this Study Area, and to inform the nature, scale and scope of the solutions that we need to consider to meet them, we have assessed:

The **water quality** that we can supply;

The **water quantity** that we can supply;

The **reliability** of our existing supplies; and

Additional information that impacts the long-term **sustainability** of our sources or infrastructure.

2.1 Water Quality

We assess the water quality investment needs of our water supplies by assessing the performance of our assets against the barriers set out in Chapter 5 of the Framework Plan. As set out in Chapter 5 of the Framework Plan, Irish Water is developing scientifically robust datasets to assign risk. Irish Water are utilising the well-established ‘Failure Mode Effect Analysis’ which provides a step-by-step approach for identifying all possible failure modes that can result in a hazardous event. Once identified, we assess risk against the existing controls (Barriers), which we have in place for source protection within our water treatment plants and networks. This Barrier Assessment process highlights where there is a deficit or potential for future deficit in these controls or treatment process elements.

The barriers are an internal gauge and the initial desktop assessments of barrier performance for SAI are summarised in Table 2.1

Table 2.1 Quality: Barrier Scores

Quality: Barrier Scores				
Water Treatment Plants	Barrier 1: Bacteria & Virus	Barrier 2.1: Maintain chlorine Residual in the Network	Barrier 3 Protozoa (Crypto) Asset Potential	Barrier 6b THM's Leading Indicator
Kilgarvan (Glanlough) WTP	●	●	●	●
Lauragh WTP	●	●	●	●
Waterville WTP	●	●	●	●
Kenmare WTP	●	●	●	●
Sneem WTP	●	●	●	●
Castlecove (Gowlane) WTP	●	●	●	●
Caherdaniel WTP	●	●	●	●

Quality: Barrier Scores				
Water Treatment Plants	Barrier 1: Bacteria & Virus	Barrier 2.1: Maintain chlorine Residual in the Network	Barrier 3 Protozoa (Crypto) Asset Potential	Barrier 6b THM's Leading Indicator
Lee Road WTP	●	●	●	●
Kilva WTP	●	●	●	●
Kealkill WTP	●	●	●	●
Reenmeen Woods WTP	●	●	●	TBC
Ballyverane WTP	●	●	●	●
Kilnagurteen WTP	●	●	●	TBC
Coolyhane WTP	●	●	●	●
Macroom WTP	●	●	●	●
Ballyhilty WTP	●	●	●	●
Ballyshoneen WTP	●	●	●	TBC
Knockburden WTP	●	●	●	●
Cluain Court (Allihies) WTP	●	●	●	TBC
Johnstown WTP	●	●	●	TBC
Coppeen WTP	●	●	●	●
Ballincurrig WTP	●	●	●	TBC
Mogeely WTP	●	●	●	●
Tibbotstown WTP	●	●	●	●
Midleton WTP	●	●	●	●
Carriglusky WTP	●	●	●	●
Bilberry WTP	●	●	●	TBC

Quality: Barrier Scores				
Water Treatment Plants	Barrier 1: Bacteria & Virus	Barrier 2.1: Maintain chlorine Residual in the Network	Barrier 3 Protozoa (Crypto) Asset Potential	Barrier 6b THM's Leading Indicator
Cape Clear WTP	●	●	●	TBC
Lyre (Clonakilty) WTP	●	●	●	●
Clonakilty (Jones Bridge) WTP	●	●	●	●
Bayview WTP	●	●	●	●
Ratharoon WTP	●	●	●	TBC
Clashanamid WTP	●	●	●	TBC
Carhue WTP	●	●	●	●
Knockanleigh WTP	●	●	●	TBC
Killeagh (Youghal Rd) WTP	●	●	●	●
Ballymacoda Road WTP	●	●	●	●
Ballykilty WTP	●	●	●	●
Minane Bridge WTP	●	●	●	TBC
Innishannon WTP	●	●	●	●
Inniscarra WTP	●	●	●	●
Glashaboy WTP	●	●	●	●
Knockraha WTP	●	●	●	●
Watergrasshill WTP	●	●	●	TBC
Garranes WTP	●	●	●	TBC
Templemartin WTP	●	●	●	TBC
Kilnamartyra WTP	●	●	●	TBC

Quality: Barrier Scores				
Water Treatment Plants	Barrier 1: Bacteria & Virus	Barrier 2.1: Maintain chlorine Residual in the Network	Barrier 3 Protozoa (Crypto) Asset Potential	Barrier 6b THM's Leading Indicator
Rylane (Cross) WTP	●	●	●	●
Rylane (Creamery) WTP	●	●	●	●
Ballinagree WTP	●	●	●	TBC
Clondrohid WTP	●	●	●	TBC
Ballymakeera WTP	●	●	●	●
Crostera WTP	●	●	●	TBC
Glengarriff WTP	●	●	●	●
Aghabullogue WTP	●	●	●	●
Coolineagh WTP	●	●	●	●
Donoughmore WTP	●	●	●	●
Grenagh WTP	●	●	●	●
Vicarstown WTP	●	●	●	●
Stoneview WTP	●	●	●	●
Whitechurch WTP	●	●	●	●
Carrignavar WTP	●	●	●	●
Clash WTP	●	●	●	●
Corbally WTP	●	●	●	TBC
Walshtown Beg WTP	●	●	●	●
Dungourney WTP	●	●	●	TBC
Ballymacoda WTP	●	●	●	TBC

Quality: Barrier Scores				
Water Treatment Plants	Barrier 1: Bacteria & Virus	Barrier 2.1: Maintain chlorine Residual in the Network	Barrier 3 Protozoa (Crypto) Asset Potential	Barrier 6b THM's Leading Indicator
Kilcraheen WTP	●	●	●	TBC
Knockadoon WTP 1	●	●	●	●
Knockadoon WTP 2	●	●	●	●
Drinagh WTP	●	●	●	TBC
Dursey Island WTP	●	●	●	TBC
Cahermore WTP	●	●	●	TBC
Ballydonegan WTP	●	●	●	TBC
Allihies WTP	●	●	●	TBC
Castletownbere WTP	●	●	●	●
Adrigole WTP	●	●	●	TBC
Whiddy Island WTP	●	●	●	●
Cahernacrin WTP	●	●	●	●
Derryginagh WTP	●	●	●	●
Dromore WTP	●	●	●	●
Caheragh WTP	●	●	●	●
Durrus WTP	●	●	●	●
Kilcrohane WTP	●	●	●	●
Crookhaven WTP	●	●	●	●
Goleen WTP	●	●	●	TBC
Toormore WTP	●	●	●	TBC

Quality: Barrier Scores

Water Treatment Plants	Barrier 1: Bacteria & Virus	Barrier 2.1: Maintain chlorine Residual in the Network	Barrier 3 Protozoa (Crypto) Asset Potential	Barrier 6b THM's Leading Indicator
Baltimore (Lake Cross) WTP	●	●	●	●
Cullen WTP	●	●	●	TBC
Ard Na Killy Ridge WTP	●	●	●	●
Nohoval WTP	●	●	●	●
Roberts Cove WTP	●	●	●	TBC
Mossgrove WTP	●	●	●	TBC
Newcestown WTP	●	●	●	TBC
Dunmanway WTP	●	●	●	●
Carrignadoura WTP	●	●	●	●
Ballingeary WTP	●	●	●	●
Inchigeelagh WTP	●	●	●	TBC
Tarelton WTP	●	●	●	●
Ballydasoon WTP	●	●	●	●
Glendine WTP	●	●	●	●
Inch Cross WTP	●	●	●	TBC

Score	Irish Water Asset Standard Assessment
●	Low Risk
●	Medium Risk
●	
●	High Risk

The colour coding within the outline assessment indicates the severity of the potential risk of barrier failure. It should be noted that the table is not an indicator of non-compliance with the European Union (Drinking Water) Regulations 2014 as amended (Drinking Water Regulations), but an internal Irish Water assessment of the asset capability standard compared with the asset standard set out in Section 5.7 of the Framework Plan. The assessment provides an indication of the need to invest in areas of our asset base (human and structural) through resource planning, to ensure that we can address potential risks or emerging risks to our supplies.

Based on the barrier assessment, 65 of the 102 Water Treatment Plants in the Study Area are considered to be at high risk of failing to achieve the required standards in relation to primary disinfection (Barrier 2.1) and effectiveness of our Protozoa removal processes (Barrier 3). However, in some cases, our desktop assessments can overestimate risk; particularly when there is limited available data on the catchment characteristics of our raw water sources. As our “Source to Tap” Drinking Water Safety Plan (DWSP) assessments, which are a requirement under the Recast Drinking Water Directive (2020), are developed for each water supply, the barrier scores for all of our supplies will be updated and become more reliable.

At present, there are six (6) WRZs in SAI Cork/South Kerry on the Environmental Protection Agency (EPA) Remedial Action List (RAL), Kilgarvan, Castletownbere, Cork City, Glashaboy, Whiddy Island and Whitegate Regional WRZs.

Irish Water is progressing immediate corrective action for a number of supplies within SAI. A national programme to improve disinfection standards (Barrier 1) at water treatment facilities across Ireland was initiated by Irish Water in 2016. Examples of works undertaken and in progress to address water quality issues in SAI are included in Table 2.2. Details of the ‘in progress’ projects to address critical water quality requirements are included in Table 2.2.

Note the Belmont WTP which was supplying Crookstown, Parkmore WTP which was supplying Parkmore, Garranes WTP which was supplying Garranes were recently rationalised to Cork City WRZ. The Kilmurray (Clonmacow) WTP currently serving Kilmurray Clonmacow WRZ and Cloughduv WTP serving Crookstown will be rationalised to Cork City WRZ in foreseeable future due to water quality and source reliability issues at the WTPs. Mossrove WTP which was supplying Mossgrove was rationalised to Newcestown WRZ. Cluain Court (Allihies) WTP which was supplying Allihies was rationalised to Allihies WRZ. These works commenced after the optioneering works for this Study Area commenced therefore they are reported on separately in this Technical Report.

Table 2.2 Critical Water Quality Requirements SAI – Cork

Critical Water Quality Requirements	Progress
<p>1. Kilgarvan WRZ: This WTP is currently on the EPA RAL list due to issues with THMs in the network. Recent works at the plant included the provision of tank aeration to reduce THM levels. Works are now ongoing to optimise the in tank aeration.</p>	Ongoing
<p>2. Castletownbere WTP: This WTP is currently on the EPA RAL list due to issue with THMs in the network. IRISH WATER is currently considering solution to solve the issue.</p>	Scoping
<p>3. Glengarriff WRZ: This WTP was successfully removed from the EPA RAL last year further to THM issues and issues with the existing Protozoa barrier. Works included the upgrade of the water treatment plan to improve the ability to remove organics from the raw water and the provision of UV disinfection to improve the Protozoa barrier.</p>	Complete
<p>4. Schull and Leap Water Supply: These WRZs were successfully removed from the EPA RAL this year further to issues with THMs in the network. The WRZs have been rationalised to the Skibbereen WRZ and this resolved the issues.</p>	Complete
<p>5. Cork City Scheme (Lee Road WTP): Drinking water treatment at Lee Road began in 1879 and while there have been upgrades to the plant since then, there has been no major upgrade since the 1950s therefore the WTP requires significant upgrade. Irish Water has started construction of a new water treatment plant on the existing site at Lee Road and once works are complete, the upgraded and modernised plant will provide a more secure water supply for the future of Cork City and will facilitate the removal of the site from the EPA RAL.</p>	On going
<p>6. Whitegate Regional WRZ: The source of supply for the area is a spring source. During periods of heavy rainfall raw water can deteriorate causing issues at the WTP. IRISH WATER are currently scoping works which will include a water quality upgrade of the WTP to ensure complaint water in all-weather events.</p>	Scoping
<p>7. Glashaboy WTP: The WTP is currently on the RAL due to issues with the existing Protozoa treatment barrier. An upgrade to the WTP is proposed and IRISH WATER is currently scoping the full extent of upgrades required.</p>	Scoping
<p>8. Reservoir Cleaning Programme A major reservoir cleaning programme has been undertaken at 62 sites, which has reduced network water quality issues.</p>	Complete
<p>9. Disinfection Programme: In 2016, Irish Water completed a nationwide review of all water treatment plants where disinfection upgrades were required, followed by a programme of works to deliver the required upgrades. To date, the disinfection programme has completed upgrade works at 12 of the 102 WRZs in SAJ, based on assessed priority basis.</p> <ul style="list-style-type: none"> • Crookhaven WTP • Allihies WTP • Tarelton WTP • Coppeen WTP • Knockanleigh WTP • Clashanamid WTP 	Ongoing

Critical Water Quality Requirements	Progress
<ul style="list-style-type: none"> • Cullen WTP • Neweastown WTP • Ratharoon WTP • Knockadoon WTP 1 • Glendine WTP • Grenagh WTP 	

In summary, in relation to water quality, Irish Water will:

- Continually update Barrier Performance issues in the WRZ which have the potential to impact on drinking water quality in the region;
- Improve these assessments through the development of DWSPs for all of our supplies;
- Address the priority risks identified on the EPA Remedial Action List (noting that steps have already been taken, and are ongoing, to address these risks); and
- All residual need (grey dots) in relation to water quality will be brought through our options assessment process

2.2 Water Quantity – Supply Demand Balance

Irish Water assess the water quantity investment needs of our supplies by developing SDB calculations for each of our water supplies as summarised in Chapter 3, 4 and 6 of the Framework Plan. The calculations are used to assess the amount of water available in our supplies and compare that to the current and forecast demand for water in accordance with Figure 2.1.

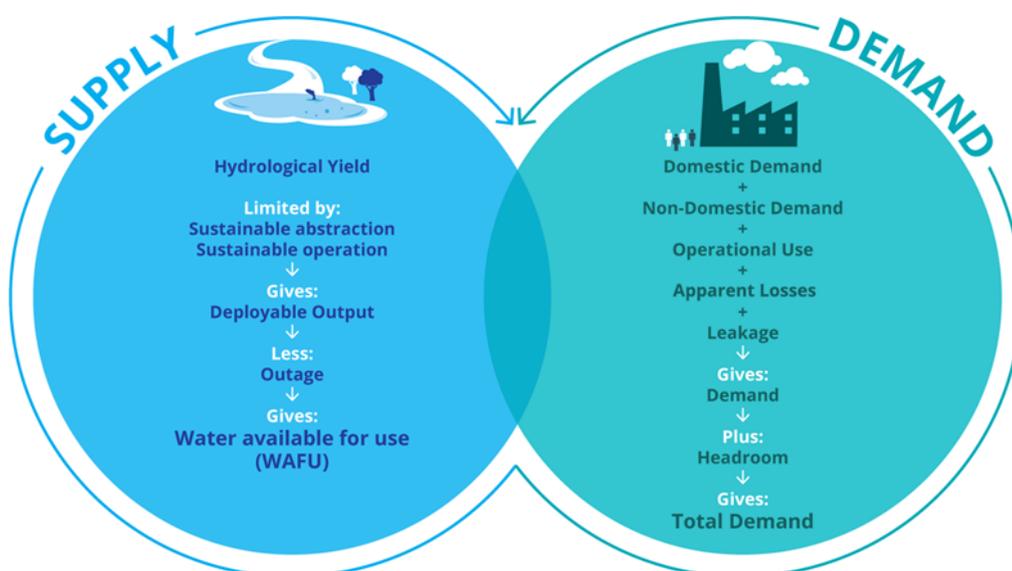


Figure 2.1 Supply Demand Balance

For each of the 89 WRZs in this Study Area, we assessed the baseline SDB and developed 25-year forecasts of supply and demand, in accordance with Figure 2.1.

The SDB assessments were carried out for each of the weather event planning scenarios (Normal Year Annual Average, Dry Year Annual Average, Dry Year Critical Period, Winter Critical Period) which described in Chapter 2 of the Framework Plan. The SDB deficits in SAI manifest in the following ways:

1. **Inappropriate standards and levels of risk for a strategic water supply:** As water supply is essential for public health, Irish Water must ensure appropriate standards of supply and be able to cope with drought conditions, peak events, and maintenance of assets. This requires adequate reserve capacity in our supplies to provide a 1 in 50 Level of service. At present, not all supplies within this Study Area meet the required levels of reserve capacity. However, due to the lack of historical monitoring, particularly in relation to groundwater supplies, some of the deficits may be data driven.
2. **Day to day operations:** 54 out of 89 water resource zones in the area suggest a supply demand balance deficit (based on a “do nothing” approach) under present & future scenarios. While sufficient during normal weather conditions, several would fail in drought. During the drought in summer 2018, all of our groundwater supplies were monitored due to falling levels in the groundwater bodies, and one of the larger supplies, Clonakilty WRZ was severely impacted. The schemes impacted by potential drought include Roberts Cove WTP, Aghabullogue WTP, Cahernacrin WTP, Carhue WTP, Crookhaven WTP, Derryginagh WTP, Dunmanway WTP, Durrus WTP, Glengarriff WTP, Kilcrohane WTP, Caherdaniel WTP, Castlecove WTP and Lauragh WTP.

A summary of the SDB deficit across all 89 Water Resource Zones is summarised in Table 2.3. The water resources zones are detailed in Appendix L of the Framework Plan - Supply Demand Balance Summaries.

Table 2.2 WRZ SDB Dry Year Critical Period Deficits (DYCP)

Water Resource Zone Name	Water Resource Zone code	Population	Maximum Deficit m ³ /day					
			2019	2025	2030	2035	2040	2044
Kilgarvan	1300SC0029	815	No Deficit	No Deficit	No Deficit	No Deficit	-7	-13
Lauragh PWS 051A	1300SC0027	72	-57	-57	-58	-59	-59	-60
Waterville PWS 075H	1300SC0023	1,330	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Kenmare / Kilgarvan	1300SC0019	2,898	-1,114	-1,153	-1,193	-1,221	-1,248	-1,270
Sneem PWS 068A	1300SC0018	446	-340	-345	-349	-353	-357	-360
Caherdaniel / Castlecove	1300SC0017	342	-857	-863	-868	-872	-876	-879
Whitegate Regional	0500SC0184	9,741	-1,915	-2,056	-2,158	-2,260	-2,360	-2,441
Kealkill	0500SC0183	714	-205	-210	-214	-218	-222	-226
Reenmeen West	0500SC0181	33	-5	-5	-6	-6	-6	-6
Ballyverane	0500SC0180	10	-1	-1	-1	-1	-1	-1
Kilnagurteen (Macroon)	0500SC0179	19	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Coolyhane	0500SC0178	70	-54	-55	-56	-56	-57	-57

Water Resource Zone Name	Water Resource Zone code	Population	Maximum Deficit m ³ /day					
			2019	2025	2030	2035	2040	2044
Macroom	0500SC0177	4,097	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Skibbereen	0500SC0173	7,255	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Ballyshoneen	0500SC0172	74	-26	-26	-27	-27	-27	-28
Knockburden	0500SC0171	71	No Deficit	No Deficit	No Deficit	0	0	0
Cluain Court Allihies	0500SC0170	13	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Johnstown	0500SC0169	18	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Coppeen	0500SC0168	45	-9	-9	-9	-10	-10	-10
Ballincurrig Lisgoold	0500SC0167	243	-1	-2	-3	-4	-5	-6
Mogeely	0500SC0162	2,944	-1	-14	-32	-51	-70	-85
Tibbotstown	0500SC0161	9,273	-2,463	-2,699	-2,903	-3,071	-3,237	-3,370
Midleton	0500SC0159	8,458	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Cloyne	0500SC0158	3,475	-663	-702	-727	-753	-779	-799
Bilberry	0500SC0157	17	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit

Water Resource Zone Name	Water Resource Zone code	Population	Maximum Deficit m ³ /day					
			2019	2025	2030	2035	2040	2044
Cape Clear	0500SC0155	124	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Lyre Clonakilty	0500SC0154	42	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Clonakilty	0500SC0153	13,584	-3,770	-4,006	-4,358	-4,556	-4,746	-4,898
Bayview	0500SC0152	23	-55	-56	-56	-56	-56	-56
Ratharoon	0500SC0147	11	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Clashanamid	0500SC0146	18	-1	-1	-2	-2	-2	-2
Bandon Regional	0500SC0145	9,188	-1,579	-1,648	-1,711	-1,774	-1,837	-1,887
Knockanleigh	0500SC0095	13	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Killeagh	0500SC0085	1,039	-183	-188	-194	-200	-206	-211
Ballykilty	0500SC0084	124	-13	-13	-14	-15	-15	-16
Minane Bridge	0500SC0083	152	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Cork City	0500SC0082	284,940	-27,774	-32,512	-38,655	-44,508	-50,334	-54,996
Templemartin & Garranes	0500SC0081	74	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit

Water Resource Zone Name	Water Resource Zone code	Population	Maximum Deficit m ³ /day					
			2019	2025	2030	2035	2040	2044
Kilnamartyra	0500SC0078	91	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Rylane	0500SC0074	387	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Ballinagree	0500SC0073	182	-12	-12	-13	-14	-15	-15
Clondrohid	0500SC0071	189	-61	-62	-63	-64	-65	-66
Ballymakeera	0500SC0070	666	-143	-147	-151	-156	-160	-164
Crostera	0500SC0069	33	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Glengarriff	0500SC0068	360	-247	-261	-273	-280	-287	-292
Aghabullogue	0500SC0059	164	-63	-64	-65	-66	-67	-68
Coolineagh	0500SC0058	6	0	0	0	0	-1	-1
Donoughmore	0500SC0057	905	-155	-167	-176	-183	-189	-194
Grenagh	0500SC0055	955	-297	-304	-311	-317	-324	-329
Vicarstown	0500SC0054	32	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Stoneview Blarney	0500SC0053	113	-1	-3	-4	-4	-5	-6

Water Resource Zone Name	Water Resource Zone code	Population	Maximum Deficit m ³ /day					
			2019	2025	2030	2035	2040	2044
Whitechurch	0500SC0051	691	-704	-714	-719	-723	-727	-731
Carrignavar	0500SC0050	517	No Deficit	No Deficit	No Deficit	No Deficit	-1	-4
Clash Leamleara	0500SC0048	40	-12	-12	-12	-13	-13	-13
Corbally	0500SC0047	206	-47	-48	-50	-51	-52	-53
Walshtown	0500SC0046	61	-7	-8	-8	-8	-8	-9
Dungourney	0500SC0044	132	-11	-12	-13	-14	-15	-16
Inch	0500SC0043	26	-12	-12	-13	-13	-13	-13
Youghal Regional	0500SC0042	8,196	-1,171	-1,214	-1,276	-1,337	-1,398	-1,446
Ballymacoda	0500SC0041	358	-49	-51	-54	-57	-60	-62
Kilcraheen	0500SC0040	40	-33	-34	-34	-34	-34	-35
Knockadoon	0500SC0039	134	-85	-87	-88	-90	-91	-92
Drinagh	0500SC0038	242	-11	-13	-14	-16	-18	-19
Dursey Island	0500SC0037	3	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit

Water Resource Zone Name	Water Resource Zone code	Population	Maximum Deficit m ³ /day					
			2019	2025	2030	2035	2040	2044
Cahermore	0500SC0036	15	-12	-12	-12	-13	-13	-13
Allihies	0500SC0035	73	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	0
Castletownbere	0500SC0034	2,341	-665	-703	-726	-749	-772	-791
Adrigole	0500SC0033	237	-169	-172	-174	-176	-179	-180
Whiddy Island	0500SC0031	20	-40	-41	-41	-41	-41	-41
Bantry	0500SC0030	3,891	-705	-770	-831	-870	-907	-937
Dromore Bantry	0500SC0029	73	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Caheragh	0500SC0028	174	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Durrus	0500SC0027	367	-23	-26	-31	-34	-38	-40
Kilcrohane	0500SC0026	149	-9	-9	-10	-11	-12	-13
Crookhaven	0500SC0025	66	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Goleen	0500SC0024	137	No Deficit	No Deficit	No Deficit	No Deficit	-2	-4
Toormore	0500SC0023	34	-3	-3	-4	-4	-5	-5

Water Resource Zone Name	Water Resource Zone code	Population	Maximum Deficit m ³ /day					
			2019	2025	2030	2035	2040	2044
Skibbereen	0500SC0021	2,765	-697	-719	-743	-768	-792	-811
Cullen	0500SC0020	10	0	-1	-1	-1	-1	-1
Ard Na Killy Ridge	0500SC0019	28	-41	-42	-42	-42	-43	-43
Nohoval	0500SC0017	125	-29	-30	-31	-32	-33	-33
Roberts Cove	0500SC0016	55	No Deficit	No Deficit	No Deficit	No Deficit	0	-1
Mossgrove	0500SC0014	17	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Newcestown	0500SC0013	102	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Dunmanway	0500SC0012	2,049	No Deficit	-43	-88	-112	-135	-154
Carrignadoura	0500SC0010	105	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Ballingeary	0500SC0009	243	No Deficit	No Deficit	No Deficit	No Deficit	-1	-2
Inchigeelagh	0500SC0008	140	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit
Tarelton	0500SC0007	9	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit	No Deficit

As outlined in Chapter 4 of the Framework Plan, the estimated population currently living in each WRZ has been based on the 2016 Census data. Forecasts for future populations have been based on draft growth projections from the National Planning Framework (NPF), and updated information from the Regional Spatial and Economic Strategies (RSES) and Local Authority Planning sections (where available).

The target 1 in 50 level of service in the region were applied in each case, along with the corresponding requirements for reserves, indicating that our supplies are operating with a cumulative SDB deficit of approximately 46,601 m³/day for the Study Area. As a result, while we can continue to supply water, the water supplies in this area may come under pressure, particularly in drought conditions. In addition, there may be ongoing reliability issues.

This situation will further deteriorate over time due to climate change driven reductions in water resources, together with increased demand due to population growth. If we do nothing, the SDB deficit is projected to increase to 78,372 m³/day by 2044.

Our ongoing activities to improve the Supply Demand Balance in SAI Cork/South Kerry are prioritised as:

- Ongoing leakage management including active leakage control, pressure management and find and fix activities to meet target levels of Leakage
- Water Conservation measures, including information campaigns and initiatives, and Water Conservation Orders during drought periods

2.3 Water Supply Reliability

The benefits of having sufficient water supplies in terms of quality and quantity are negated if we cannot distribute the water we produce effectively around our networks. We also need sufficient treated water storage to enable us to respond to planned or unplanned outages on our trunk main and distribution networks.

There are a number of problematic distribution and trunk mains throughout SAI. Irish Water & the Local Authority Water Services sections will continue to monitor the performance of all water mains in the network to ensure that the most problematic mains are replaced as required.

To date, a significant amount of watermain rehabilitation has been carried out across Study Area I. This provides for a more reliable water supply, reducing instances of bursts and water outages. The works also improve water quality by replacing old cast iron and lead watermains, whilst reducing leakage and improving overall operation and maintenance of our supply system.

During our needs assessment for SAI Irish Water has identified a number of critical requirements for upgrades to the existing asset base, including storage and trunk main requirements. Progress to date on these projects is summarised in Table 2.4.

Table 2.4 SAI Critical Infrastructure Projects and Need Identification

Critical Water Supply Reliability Requirement	Progress
1. Castletownbere Trunk Main: A 13.4km 300mm asbestos cement trunk main supplies potable water from Castletownbere WTP via Eyerries to Foildarrig Reservoir. Rehabilitation	Need Identified

Critical Water Supply Reliability Requirement	Progress
works have been designed for an 8.2km section of this trunk main with a section of that work already completed and funding approved for a further section.	
<p>2. Dunmanway Trunk Main: This raw water main between Coolkellure Lake and Dunmanway WTP comprises 550m of 300mm asbestos cement (AC) pipework and twin 150mm AC supplies. Part of the section of main from the source is laid through a wooded area with extremely difficult access. Bursts in the wooded areas are extremely treacherous and difficult to find, therefore it is proposed to replace/reinforce this section of main.</p>	Need Identified
<p>3. Foildarrig Reservoir: This 4,550 m³ reservoir has a significant number of hair-line cracks and several major cracks on the roof slab of the reservoir. This may indicate slab failure with drops in levels either side of the cracks. There is the potential for the ingress of water into the reservoir.</p>	Need Identified
<p>4. Ballylynchy, Tragumna, Clondrohid, Coolea and Toormore Reservoir: Assessment of these assets have determined that these reservoirs required upgrade works.</p>	Need Identified
<p>5. Carhue WTP to Convent Hill Trunk Main: This 300mm asbestos cement watermain supplies potable water from Carhue WTP to Convent Hill Reservoir. There have been 15 bursts in the last six (6) years on this main which is located on the R586.</p>	Need Identified
<p>6. Innishannon Trunk Main: This 450mm asbestos cement watermain on the N71 supplies potable water from Innishannon WTP as far as Ballinhassig. The section of mains from Ballinhassig to Ballea was recently replaced. Since these mains replacement works, the asbestos cement section upstream of Ballinhassig has had two bursts.</p>	Need Identified
<p>7. Trunk Main – Old Carrigaline Road via Donnybrook and Grange to Spur Hill: This 300mm asbestos cement watermain is on the Cork Harbour & City Scheme and is fed from the Carrs Hill Reservoir. It supplies potable water from the Old Carrigaline Road via Donnybrook and Grange as far as Spur Hill. There have been a number of bursts on this main in recent years.</p>	Need Identified
<p>8. Ringaskiddy Trunk Main: This 450mm asbestos cement watermain is on the Cork Harbour & City Scheme and serves critical pharmaceutical industries as well as Cork Port and the Naval Base. Most of the initial asbestos cement main has been replaced with the exception of this remaining 160m section.</p>	Need Identified
<p>9. Cork City Trunk Mains: The critical infrastructure for the network in the city is the large bore cast iron water mains. These can be summarized as follows:</p> <ul style="list-style-type: none"> • 450mm CI main on Kilmore Road/Churchfield Road • 350mm CI main on Blarney Street & Old Youghal Road • 350mm CI main in SB Trunk • 1300m of 450mm CI mains in the Booster Trunk DMA • 2,400m of 350mm CI mains in the S_A_Trunk DMA • 2,100m of 300mm CI mains in the SA_SE/SW DMA • 2,200m of 350mm CI mains in the Mid C Trunk DMA • 1,900m of 300mm CI mains in the Mid C E Mahon DMA • 1,000m of 300mm CI mains in the Mahon Trunk DMA • 500m of 300mm CI mains in the Sars NE DMA 	Need Identified

Critical Water Supply Reliability Requirement	Progress
<ul style="list-style-type: none"> 550m of 300mm CI mains in the Chetwynd Trunk DMA 	
<p>10. Cork City Recent Bursts There have been recent bursts on a number of watermains in Cork City:</p> <ul style="list-style-type: none"> Burst on a 350mm CI main in the woods on Lee Road Burst on a joint between a 450mm DI main and 400mm PE main on Cathedral Road Burst on a 450mm CI main at North Mall <p>These bursts have occurred on mains that are comprised of different materials and are in areas with potentially difficult access – urban environment and a wooded area.</p>	Need Identified
<p>11. Critical network upgrades and controls: Identification of priority network upgrades, new control valves and pressure controls required across the region.</p>	Detailed Design
<p>12. Distribution Network Repairs and Upgrades: Rolling programme of active leakage control, pressure management, find and fix and network upgrades.</p>	Construction

In summary, there are some asset reliability issues across the distribution network within the WRZ. Some critical infrastructural projects, outlined in Table 2.4, to address these issues have been identified and are in progress. In addition to this, a continuous programme of repairs, upgrades and leakage reduction is being progressed as part of Irish Waters National Leakage Reduction Programme across all Study Areas.

2.4 Water Supply Sustainability

The water supplies within the region were developed over time to address the needs of the local populations and to support growth and development.

As outlined at Section 3.7.2 of the Framework Plan, the Government is currently developing new legislation dealing with water abstractions. While at the end of 2022, the government passed the Water Environment (Abstractions and Associated Impoundments) Act, 2022, this act has not yet commenced and its associated regulations and guidelines which will further detail the types of assessment and national methodology to be used are not yet in place. As this legislation is still being developed, we do not yet have full visibility of the future regulatory regime. We have therefore not progressed through a theoretical licencing process on a site by site basis and cannot reliably include an estimation of sustainable abstraction within the SDB calculations. Instead, we use the hydrological yield, water treatment capacity and bulk transfer limitations in our calculation of DO. This assessment procedure is set out at Appendix C of the Framework Plan, and in line with a precautionary approach.

To understand the potential impact of the pending Abstraction Legislation on the SAI supplies, we have assessed the potential impacts on our 44 no. surface water abstractions at Clashduff River (Adrigole), Allihies Impoundment (Allihies), Bunsheelin (Ballingeary), Bandon River (Bandon Regional), Drombrow Lake Intake (Bantry), Inchilough (Bantry), Lough Bofinna Intake (Bantry), Coonmahorna West River (Caherdaniel / Castlecove), Gowla River (Behaghane) (Caherdaniel / Castlecove), Gowlane Stream (Caherdaniel / Castlecove), Cahermore River (Cahermore), Glenbeg (Castletownbere), Argideen River, Jones Bridge (Clonakilty), Butlerstown River Tributary (Cork City), , Coolguerisk (Cork City), Glashaboy River (Cork City), Inishannon (Cork City), Inniscarra (Cork City), River Lee (Cork City), Crookhaven Impoundment (Arduslough) (Crookhaven), Barley Lake (Crosteria), Curraghlicky Lake (Drinagh), Coolkellure lake (Dunmanway), Barony River (Glengarriff), Goleen Intake (Goleen), Owengar River

(Kealkill), Lough Eirk (stream) (Kenmare / Kilgarvan), Coomclogherane Lake S64 (Kilgarvan), Ahadav stream (Lauragh PWS 051A), Sullane River (Macroon), Owenacurra River (Midleton), Kiltha River (Mogeely), Lough Abisdealy (Skibbereen), River Ilen (Skibbereen), Dromtine Lough S72 (Sneem PWS 068A), Tibbotstown Reservoir (Tibbotstown), Owenacurra River (Over Pump) (Tibbotstown), Finglas River (Tributary) (Waterville PWS 075H), Lough Currane (Waterville PWS 075H), Kilmore lakes (Whiddy Island), Tourig River Source (Youghal Regional) and Glendine River (Youghal Regional).

Table 2.5 presents the findings of this assessment in order to indicate the potential reductions to abstraction that may be required at our existing surface water supplies. The table presents our current abstraction levels¹, our source hydrological yield², and our estimated sustainable abstraction³ amount which the source may be limited to in the future.

Based on this initial assessment, the volumes of water abstracted at Allihies Impoundment (Allihies), Drombrow Lake Intake (Bantry), Inchilough (Bantry), Lough Bofinna Intake (Bantry), Coonmahorna West River (Caherdaniel / Castlecove), Gowla River (Behaghane) (Caherdaniel / Castlecove), Gowlane Stream (Caherdaniel / Castlecove), Cahermore River (Cahermore), Glenbeg (Castletownbere), Arideen River, Jones Bridge (Clonakilty), Butlerstown River Tributary (Cork City), Coolguerisk (Cork City), Glashaboy River (Cork City), Inishannon (Cork City), Inniscarra (Cork City), River Lee (Cork City), Crookhaven Impoundment (Arduslough) (Crookhaven), Coolkellure lake (Dunmanway), Barony River (Glengarriff), Goleen Intake (Goleen), Owengar River (Kealkill), Lough Eirk (stream) (Kenmare / Kilgarvan), Coomclogherane Lake S64 (Kilgarvan), Ahadav stream (Lauragh PWS 051A), Owenacurra River (Midleton), Kiltha River (Mogeely), Lough Abisdealy (Skibbereen), River Ilen (Skibbereen), Tibbotstown Reservoir (Tibbotstown), Owenacurra River (Over Pump) (Tibbotstown), Tourig River Source (Youghal Regional), and Glendine River (Youghal Regional) may not meet sustainability guidelines during dry weather flows. However, under the proposed regulatory regime, sustainable abstraction quantities will be adjudicated by the EPA. We have assumed, given the need to maintain supplies, that a transition to new abstraction quantities would likely take place in the medium term.

Table 2.5 Comparison of Current Abstraction, Hydrological Yield and Theoretical Future Abstraction

Source (WRZ)	Current abstraction (m3/day)	Hydrological yield (m3/day)	Theoretical Future abstraction (m3/day)
Clashduff River (Adrigole)	166	472	219
Allihies Impoundment (Allihies)	73	47	31
Bunsheelin (Ballingeary)	105	543	304
Bandon River (Bandon Regional)	4,510	31,158	9,130
Drombrow Lake Intake (Bantry)	1,219	678	93
Inchilough (Bantry)	1,219	1,476	500
Lough Bofinna Intake (Bantry)	1,348	1,125	57
Coonmahorna West River (Caherdaniel / Castlecove)	550	22	12
Gowla River (Behaghane) (Caherdaniel / Castlecove)	550	28	11

¹ Based on WTP 22hr (DYCP) capacity

² Our hydrological yield estimate is the 'safe' yield calculated to be available during a 1 in 50 year drought event. We use this figure in the SDB calculations to determine whether a WRZ is projected to be in deficit or surplus

³ Our sustainable or 'allowable' abstraction estimate is based on limiting abstraction to 5-15% of the Q95 low flow for river sources or 10% of Q50 inflow for lakes. This is based on our best understanding of how the EPA may enforce future abstraction licencing applying UKTAG guidance.

Source (WRZ)	Current abstraction (m3/day)	Hydrological yield (m3/day)	Theoretical Future abstraction (m3/day)
Gowlane Stream (Caherdaniel / Castlecove)	550	19	7
Cahermore River (Cahermore)	22	9	4
Glenbeg (Castletownbere)	2,921	4,389	986
Argideen River, Jones Bridge (Clonakilty)	7,883	7,287	1,894
Butlerstown River Tributary (Cork City)	1,558	486	71
Butlerstown River Tributary (Cork City)	1,558	930	140
Coolguerisk (Cork City)	1,558	924	139
Glashaboy River (Cork City)	20,836	14,096	4,079
Inishannon (Cork City)	10,083	41,215	11,596
Inniscarra (Cork City)	82,500	303,932	152,828
River Lee (Cork City)	33,000	159,000	37,940
Crookhaven Impoundment (Arduslough) (Crookhaven)	160	251	29
Barley Lake (Crostera)	66	2,953	305
Curraghlicky Lake (Drinagh)	226	3,811	1,714
Coolkellure lake (Dunmanway)	1,073	1,076	381
Barony River (Glengarriff)	333	259	109
Goleen Intake (Goleen)	99	105	14
Owengar River (Kealkill)	245	541	200
Lough Eirk (stream) (Kenmare / Kilgarvan)	1,100	623	71
Coomclogherane Lake S64 (Kilgarvan)	528	1,312	164
Ahadav stream (Lauragh PWS 051A)	66	93	61
Sullane River (Macroom)	2,017	18,125	5,444
Owenacurra River (Midleton)	5,042	7,926	2,775
Kiltha River (Mogeely)	1,054	1,975	431
Lough Abisdealy (Skibbereen)	1,467	1,737	729
River Ilen (Skibbereen)	7,578	11,611	1,461
Dromtine Lough S72 (Sneem PWS 068A)	528	7,844	893
Tibbotstown Reservoir (Tibbotstown)	6,600	517	202
Owenacurra River (Over Pump) (Tibbotstown)	6,600	1,620	1,620
Finglas River (Tributary) (Waterville PWS 075H)	1,826	120	67
Lough Currane (Waterville PWS 075H)	1,826	177,397	44,618
Kilmore lakes (Whiddy Island)	61	8	8
Tourig River Source (Youghal Regional)	2,750	4,086	889
Glendine River (Youghal Regional)	2,750	1,029	231

The potential change to the SDB for each WRZ, as a result of these potential reductions in abstraction during Dry Weather Flow are summarised in Table 2.6.

Table 2.6 Potential Change to the SDB Based on Potential Abstraction Reductions

Source (WRZ)	Potential change in SDB (m ³ /d)
Clashduff River (Adrigole)	None
Allihies Impoundment (Allihies)	-15
Bunsheelin (Ballingeary)	None
Bandon River (Bandon Regional)	None
Drombrow Lake Intake (Bantry)	-1,600
Inchilough (Bantry)	-1,600
Lough Bofinna Intake (Bantry)	-1,600
Coonmahorna West River (Caherdaniel / Castlecove)	-32
Gowla River (Behaghane) (Caherdaniel / Castlecove)	-32
Gowlane Stream (Caherdaniel / Castlecove)	-32
Cahermore River (Cahermore)	-5
Glenbeg (Castletownbere)	-2,077
Arideen River, Jones Bridge (Clonakilty)	-4,401
Butlerstown River Tributary (Cork City)	-9,039
Butlerstown River Tributary (Cork City)	-9,039
Coolguerisk (Cork City)	-9,039
Glashaboy River (Cork City)	-9,039
Inishannon (Cork City)	-9,039
Inniscarra (Cork City)	-9,039
River Lee (Cork City)	-9,039
Crookhaven Impoundment (Arduslough) (Crookhaven)	-107
Barley Lake (Crostera)	No Deficit
Curraghlicky Lake (Drinagh)	None
Coolkellure lake (Dunmanway)	-616
Barony River (Glengarriff)	-128
Goleen Intake (Goleen)	-81
Owengar River (Kealkill)	-59
Lough Eirk (stream) (Kenmare / Kilgarvan)	-450

Source (WRZ)	Potential change in SDB (m3/d)
Coomclogherane Lake S64 (Kilgarvan)	-388
Ahadav stream (Lauragh PWS 051A)	-8
Sullane River (Macroom)	No Deficit
Owenacurra River (Midleton)	-2,337
Kiltha River (Mogeely)	-685
Lough Abisdealy (Skibbereen)	-838
River Ilen (Skibbereen)	-5,303
Dromtine Lough S72 (Sneem PWS 068A)	None
Tibbotstown Reservoir (Tibbotstown)	-257
Owenacurra River (Over Pump) (Tibbotstown)	-257
Finglas River (Tributary) (Waterville PWS 075H)	No Deficit
Lough Currane (Waterville PWS 075H)	No Deficit
Kilmore lakes (Whiddy Island)	None
Tourig River Source (Youghal Regional)	-1,757
Glendine River (Youghal Regional)	-1,757

The net impact of these potential minimum environmental flow requirements has been assessed using the outline assessment methodology described in Appendix C of the Framework Plan.

Groundwater abstractions will need to conform to the proposed new abstraction licencing regime. These abstractions will be assessed in two ways:

- Impacts on the groundwater bodies from which they abstract; and
- Impact of the groundwater abstraction on the base flow in surface waterbodies.

As noted in Section 3.2.2 of the Framework Plan producing robust desktop assessments of water availability from our existing groundwater abstractions is very difficult. Ideally, yield estimates would be based on a three-dimensional assessment of the geology within the vicinity of the supply, supplemented with long term records on pumping and drawdown of water levels over many years. Irish Water does not have this type of information available for most of our groundwater supplies and while we will aim to complete site-specific studies of groundwater availability, this may take many years.

On an interim basis Irish Water has developed an initial assessment for existing abstractions based on best available information. For more information, please see Appendix C Supply Assessment and Appendix G Regulatory and Licensing Constraints of the NWRP - Framework Plan. Over the coming years, Irish Water will work with the environmental regulator EPA and the Geological Survey of Ireland, to develop desktop and site investigation systems to better understand the sustainability of our groundwater sources. We are not in a position to estimate changes to the groundwater availability until better data is available.

In summary, when considering the requirements of the Water Framework Directive (WFD), some of our schemes may be subject to reductions in abstraction, especially during drought periods. While we have developed a potential understanding of the impact of the legislation, we cannot reliably include an estimation of sustainable abstraction within the SDB calculations.

However, we do use our sustainable abstraction estimations to assess the sensitivity of the Preferred Approach as set out in Chapter 7 of this Technical Report. This assessment determines whether the Preferred Approach is adaptable to change across a range of potential future scenarios and verifies our ability to adapt and increases our resilience to future changes.

When the new Legislation on abstraction of water has been enacted and regulatory assessments completed if an abstraction is confirmed to be affecting a waterbody status the Supply Demand Balance will be updated as outlined in the monitoring and feedback section of the RWRP, Section 9.2.2. All future abstractions considered through the Framework Plan options assessment are validated for sustainability, including options to increase abstraction at existing sites.

2.5 Water Resource Zone Needs Summary

Study Area I has issues in relation to quality, quantity, reliability and sustainability which must be addressed as part of the preferred approach to future water resources planning, summarised in Table 2.7.

Table 2.6 Summary of Need Quality, Quantity, Reliability, Sustainability

Quality	Upgrades required at all WTPs
Quantity	<p>Net Leakage Reduction of 2,294 m³/d in the region.</p> <p>Additional Leakage Targets of 40.9 ML/d to achieve SELL and reduce leakage levels to 21% of demand in WRZs with demand in excess of 1,500m³/d</p> <p>Interim additional supplies of 46.6 ML/d within 10 years</p> <p>Total of 78.4 ML/d additional supplies beyond the 10 year horizon</p>
Reliability (In addition to projects in	Continued network upgrades and improvements in the bulk and distribution networks

Sustainability

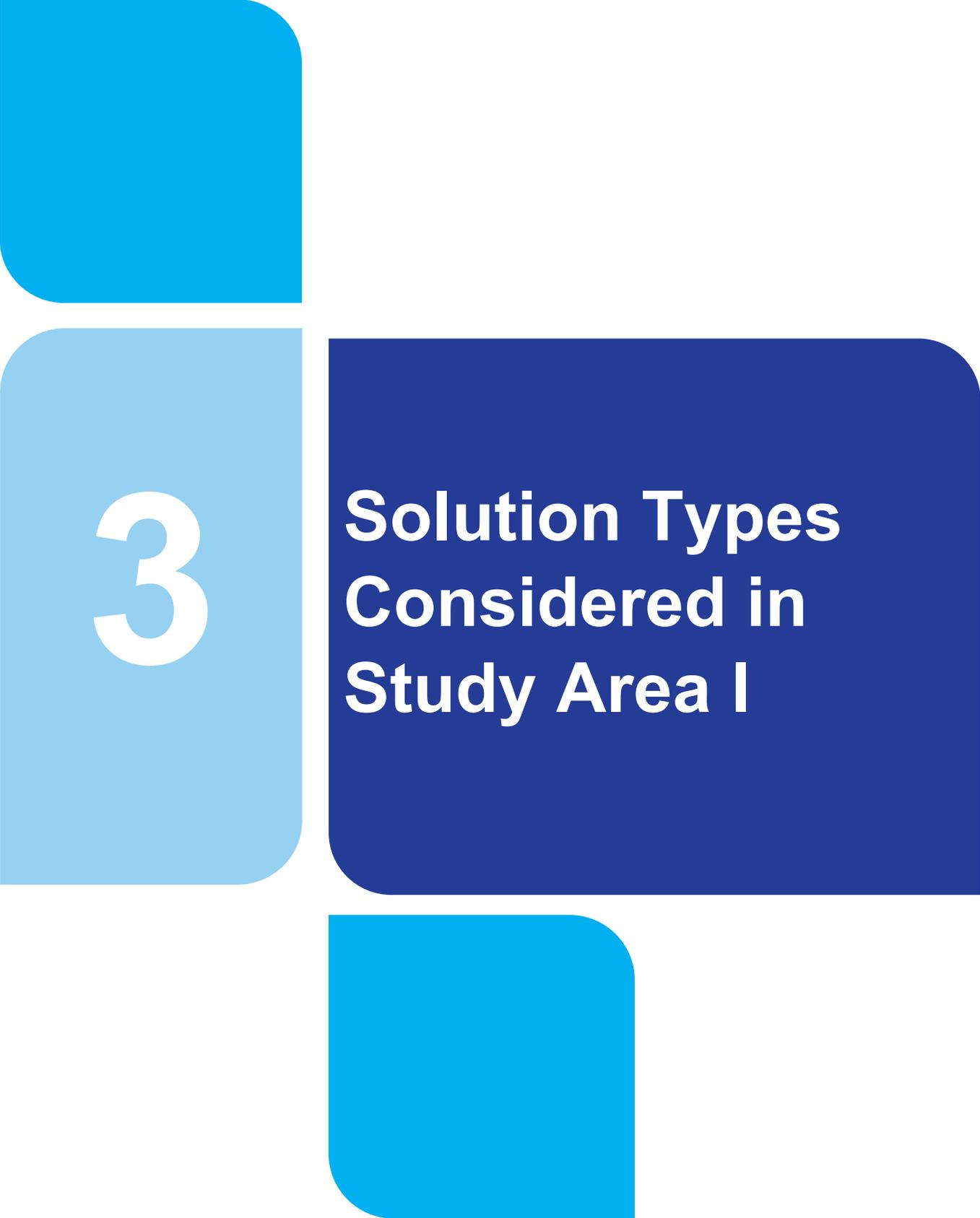
It is not envisaged that there are sustainability issues with the volumes abstracted at Clashduff River (Adrigole), Bunsheelin (Ballingeary), Bandon River (Bandon Regional), Curraghlicky Lake (Drinagh), Dromtine Lough S72 (Sneem PWS 068A), Kilmore lakes (Whiddy Island).

Based on this initial assessment, the volumes of water abstracted at Allihies Impoundment (Allihies), Drombrow Lake Intake (Bantry), Inchilough (Bantry), Lough Bofinna Intake (Bantry), Coonmahorna West River (Caherdaniel / Castlecove), Gowla River (Behaghane) (Caherdaniel / Castlecove), Gowlane Stream (Caherdaniel / Castlecove), Cahermore River (Cahermore), Glenbeg (Castletownbere), Arideen River, Jones Bridge (Clonakilty), Butlerstown River Tributary (Cork City), Coolguerisk (Cork City), Glashaboy River (Cork City), Inishannon (Cork City), Inniscarra (Cork City), River Lee (Cork City), Crookhaven Impoundment (Arduslough) (Crookhaven), Coolkellure lake (Dunmanway), Barony River (Glengarriff), Goleen Intake (Goleen), Owengar River (Kealkill), Lough Eirk (stream) (Kenmare / Kilgarvan), Coomclogherane Lake S64 (Kilgarvan), Ahadav stream (Lauragh PWS 051A), Owenacurra River (Midleton), Kiltha River (Mogeely), Lough Abisdealy (Skibbereen), River Ilen (Skibbereen), Tibbotstown Reservoir (Tibbotstown), Owenacurra River (Over Pump) (Tibbotstown), Tourig River Source (Youghal Regional), and Glendine River (Youghal Regional) may not meet sustainability guidelines during dry weather flows. However, under the proposed regulatory regime, sustainable abstraction quantities will be adjudicated by the EPA. We have assumed, given the need to maintain supplies, that a transition to new abstraction quantities would likely take place in the medium term.

Over the coming years, Irish Water will work with the environmental regulator EPA and the Geological Survey of Ireland, to develop desktop and site investigation systems to better understand the sustainability of our groundwater sources.

All of these needs will be considered within our options assessment process and in the development of the Preferred Approach.

Further details of planned, live and recently completed projects are available on our website see: <https://www.water.ie/projects-plans/our-projects/>



3

Solution Types Considered in Study Area I

3 Solution Types Considered in Study Area I

In this chapter, we summarise the type of solutions we have considered to address identified need in Study Area I.

We consider measures across the following three pillars: **Lose Less**, **Use Less** and **Supply Smarter** in forming our list of unconstrained options, which are assessed for short, medium and long-term solutions. For SAI as part of our unconstrained options, the following options have been reviewed.

3.1 Leakage Reduction



The Leakage reduction measures across the public water supply considered for SAI are based on what we assess to be both achievable and sustainable and include:

Ongoing leakage management, including active leakage control, pressure management and Find and Fix activities, to offset Natural Rate of Leakage Rise (NRR); and

Net leakage reductions targets listed in Table 3.1 have been applied to SDB deficit to move towards achieving the national Sustainable Economic Level of Leakage (SELL) target prioritised based on

- Supply demand deficit;
- Existing abstractions with sustainability issues; and
- Drought impacts.

Additional leakage Targets to achieve SELL and reduce leakage levels to 21% of demand in WRZs with demand in excess of 1,500m³/d, see Table 3.1.

Table 3.1 SELL Targets for WRZ in SA6

WRZ	Net Leakage Reduction applied to SDB(m ³)	Additional leakage Targets to achieve SELL and reduce leakage levels to 21% of demand in WRZs with demand in excess of 1,500m ³ /d (m ³)	Total Leakage Targets (m ³)
Cork City	2171	29,924	32,095
Clonakilty	123	1,556	1,679
Ard Na Killy Ridge		30	30
Cullen		5	5
Bantry		678	678
Adrigole		39	39
Castletownbere		907	907
Drinagh		2	2
Knockadoon		40	40
Kilcraheen		15	15
Clash Leamleara		12	12
Whitechurch		401	401
Donoughmore		61	61
Coolineagh		1	1
Aghabullogue		6	6

WRZ	Net Leakage Reduction applied to SDB(m ³)	Additional leakage Targets to achieve SELL and reduce leakage levels to 21% of demand in WRZs with demand in excess of 1,500m ³ /d (m ³)	Total Leakage Targets (m ³)
Glengarriff		48	48
Ballymakeera		1	1
Clondrohid		6	6
Bandon Regional		1,579	1,579
Clashanamid		2	2
Bayview		40	40
Bilberry		3	3
Cloyne		1,048	1,048
Johnstown		2	2
Ballyshoneen		1	1
Coolyhane		23	23
Ballyverane		3	3
Kealkill		49	49
Whitegate Regional		1,483	1,483
Caherdaniel / Castlecove		252	252
Sneem PWS 068A		234	234
Waterville PWS 075H		92	92
Lauragh PWS 051A		24	24
Skibbereen 1 - Ballyhilty and Drimoleague		1,183	1,183
Skibbereen 2 - Baltimore and Schull		543	543
Youghal Regional		440	440
Midleton		226	226
Tibbotstown		34	34

3.2 Water Conservation



At present, Irish Water is conducting pilot studies in relation to water conservation stewardship in businesses and is actively pursuing Conservation Education Awareness Campaigns and partnerships. During drought conditions in 2018 and 2020, a Water Conservation Order was implemented in order to protect our water supplies and reduce pressure on the natural environment during this period. We will continue to promote ‘Water Conservation Activities’, collecting and monitoring data over a number of years to assess the benefits. As part of the Framework Plan, we have not applied reductions to the SDB deficit for unquantifiable water conservation gains. However, we do assume that any gain will offset consumer usage growth factors.

3.3 Supply Smarter



The supply options considered as part of the options development are unconstrained by distance from SAI and include:

- Standalone groundwater options across the Study Area;
- Standalone surface water options across the Study Area;
- Conjunctive use;
- Cross Study Area Supply;
- Water Quality upgrades to existing WTPs;
- Transfers and Rationalisation of WRZs;
- Network improvements;
- Desalination;
- Reservoirs and other.



4

Option Development SAI

4 Option Development for Study Area I

This chapter describes how our options assessment methodology was applied to produce a Feasible Options list to meet the identified needs.

The purpose of our options assessment process, as outlined in Chapter 8 of the Framework Plan, is to consider the widest practicable range of solutions to resolve identified need within a given area. A suitable screening criterion is then applied to filter out any options that are not feasible, based on sustainability (environmental and social impacts), resilience or deliverability. As sustainability is at the heart of our plan, environmental and social assessment criteria are included at the earliest stages of the screening process. At the outset of the process, some fundamental rules are applied even before screening begins to ensure the protection of the environment. For example, having regard to WFD objectives, Irish Water does not allow for any inter-catchment raw water transfers due to the high risk of transferring invasive non-native species (INNS) between catchments and non-compliance with WFD objectives.

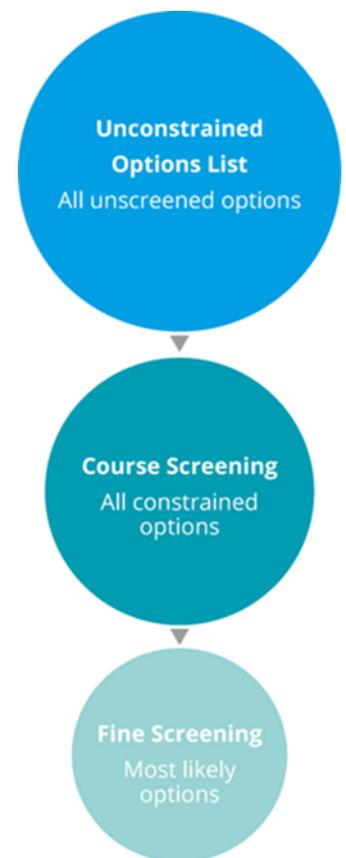
The options assessment screening process involves the following:

- Developing a long list of unconstrained options – Unconstrained Options constitute all of the possible solutions, which either fully or partly resolve a water supply deficit, regardless of any cost, environmental or social constraints. In developing the Unconstrained List, we identify options that are applicable to meet the needs of the study area.

Coarse Screening – We filter the unconstrained options using a coarse screening assessment where we remove any options that fail to meet desktop assessment criteria under: Resilience, Deliverability and Flexibility or Sustainability (Environmental and Social Impacts); and

Fine Screening – We filter the remaining options from the coarse screening exercise through a fine screening assessment, which includes 33 detailed questions, related to environmental objectives identified for the SEA (including biodiversity, the water environment and requirements under climate change adaptation) as well as Resilience, Deliverability and Progressibility.

The coarse screening and fine screening questions, and the associated scoring criteria, are included in Chapter 3 of the Study Area Environmental Report.



4.1 Developing a List of Unconstrained Options

At the start of our screening process, we conduct a specialist desktop review of groundwater bodies and surface water catchments. This allows us to understand potential additional availability at existing water abstractions or to identify any potential new water sources within the Study Area; as summarised in Table 4.1.

Table 4.1 Desktop Assessments for Unconstrained Options

Existing and New Ground Water sources	A Hydrogeologist conducts a desktop groundwater availability assessment of all potential aquifers and aquitards within, and within a reasonable distance of, the study area.
Existing and New Surface Water sources and Conjunctive Use Options	A Hydrologist carries out a desktop surface water availability assessment of all potential catchments and waterbodies within, and within a reasonable distance of, the study area.
Water Treatment upgrades, Desalination, Rationalisation and Effluent Reuse Options	An Engineer reviews any potential increases in capacity at existing water treatment sites and any potential conjunctive use or effluent reuse options.

Based on these desktop assessments, Irish Water developed an initial list of unconstrained options for new supplies and increases and upgrades to existing supplies and assets. An unconstrained options review workshop was then held with our Local Authority Partners to identify any additional unconstrained options that may be available based on local knowledge. A total list of unconstrained options was then compiled.

For SAI, 947 Unconstrained Options were identified to address need. These unconstrained options were not limited by cost, distance from the area or feasibility. These options are summarised in Table 4.2 and shown spatially in Figure 4.1.

Table 4.2 SAI Unconstrained Options

No. of Options	Option Type
141	Groundwater
299	Surface water
3	Conjunctive use
111	Transfers
49	Desalination
32	Advanced Leakage Reduction
267	Rationalisation
26	Upgrade WTP (WQ only)
4	Reservoirs
15	Other

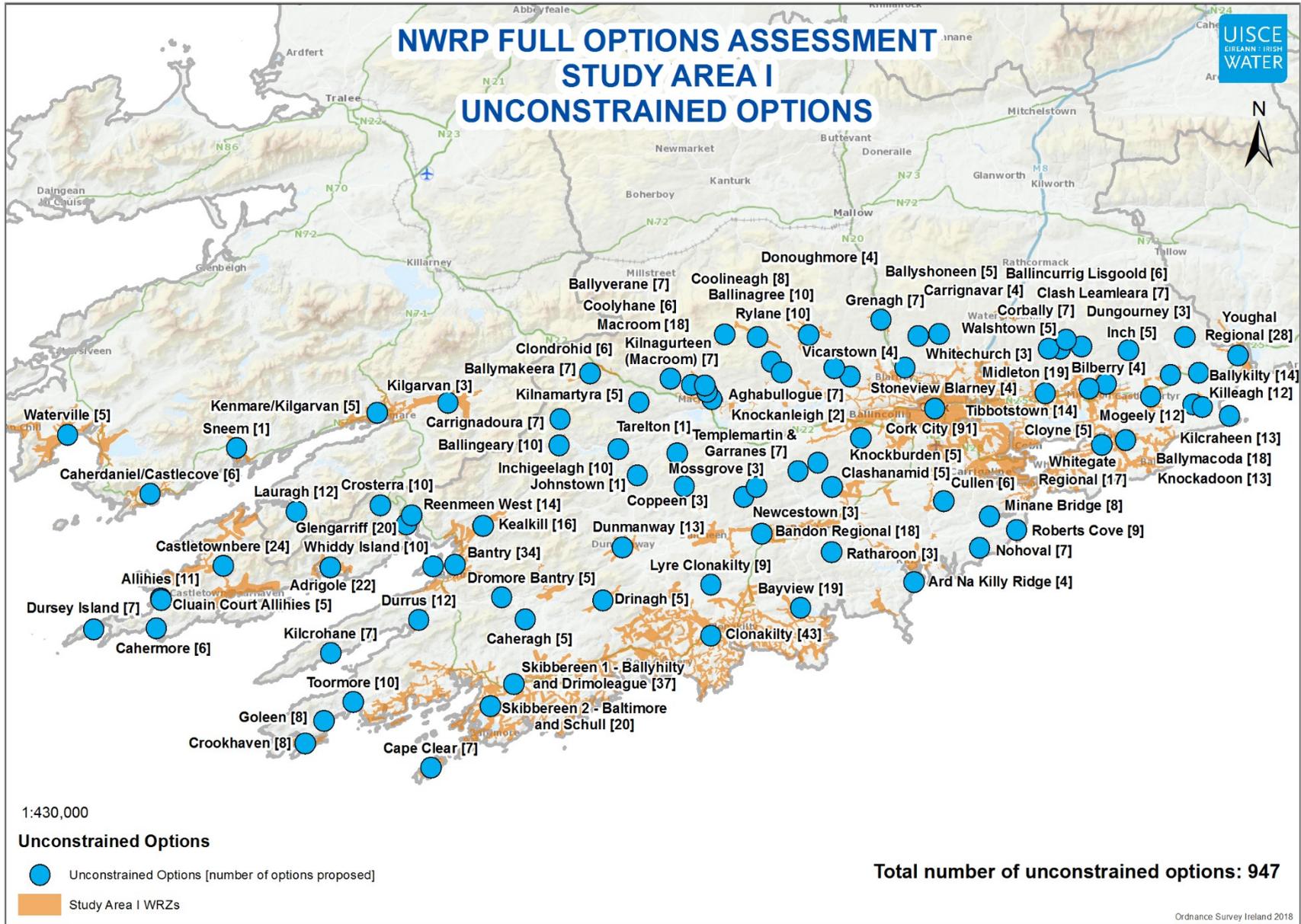


Figure 4.1 Unconstrained Options

The 947 options were filtered through our screening process to eliminate those with potentially unviable environmental impacts or feasibility issues. This process is summarised below.

4.2 Coarse Screening

The 947 identified Unconstrained Options were assessed through Coarse Screening against the criteria of:

- Resilience;
- Deliverability and Flexibility; and
- Sustainability (Environmental and Social Impacts).

The Coarse Screening process is summarised in Chapter 8 of the Framework Plan. The coarse screening assessments were conducted by a specialist team, including Engineers, Hydrologists and, Hydrogeologists, Ecologists, and Environmental Scientists.

416 Unconstrained Options were rejected at this stage as they were found to be unviable in relation to one or more assessment criteria. Details of these options and the justification for their rejection are outlined in the rejection summary, Annex B of this report. The rejection summary records the criteria against which the rejected options were assessed as having a 'red' score for the purposes of the coarse screening exercise (as explained in more detail in Chapter 8 of the framework plan), and accordingly were not brought forward at the coarse screening phase. The box below provides an example of a rejection justification for an option considered for the Bantry WRZ.

Example Rejected Option

Option SAI-384

New SW abstraction from Drimminboy River and upgrade WTP.

Rejection Reason

The Drimminboy River is a WFD good status waterbody. Abstracting 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 also to result in a greater risk of having adverse effects on this European site. Therefore, this option did not meet the requirements of the Environmental, Resilience or Deliverability criteria.

The remaining 531 options were progressed to further assessment through the Fine Screening process. The rejected options are summarised in Annex A of this Technical Report. Annex A records the criteria against which the rejected options were assessed as having a "red" score for the purposes of the coarse screening exercise (as explained in more detail in Chapter 8 of the Framework Plan), and accordingly were not brought forward at the coarse screening stage. The remaining options are summarised in Table 4.3.

Table 4.3 SAI Remaining Options after Coarse Screening

No. of Options	Option Type
86	Groundwater
140	Surface water
2	Conjunctive use
64	Transfers
11	Desalination
202	Rationalisation
25	Upgrade WTP (WQ only)
1	Reservoirs

4.3 Fine Screening

The 531 remaining options were subject to a more detailed multi-criteria assessment (MCA) at the Fine Screening Stage using desktop assessments of performance against 33 specified questions relating to Sustainability (Environmental and Social Impacts), Resilience, Deliverability and Progressibility. The assessment for each option was based on an objective assessment with uniform scoring criteria, based on best publicly available datasets.

At Fine Screening stage, no further options were rejected, with the remaining 531 options considered to be feasible and brought forward to desktop outline design and costing. These are summarised in Table 4.4 and shown spatially in Figure 4.2.

Table 4.4 SAI Remaining Options after Fine Screening (Feasible Options)

No. of Options	Option Type
86	Groundwater
140	Surface water
2	Conjunctive use
64	Transfers
11	Desalination
202	Rationalisation
25	Upgrade WTP (WQ only)
1	Reservoirs

For the purposes of the NWRP, outline designs have been prepared at a desktop level for each feasible option (for use as part of comparative assessments between options). The outline designs include a high level inventory of option requirements, including capacities of plants, pipelines, pumps and treatment requirements. They include comparative budget costs estimates for required site level studies (including site level environmental assessments), Capital (CAPEX), Operational (OPEX), Environmental and Social (E&S) costs and Carbon Costs for use in the next stage of the assessment process.

4.4 Options Assessment Summary

The supply demand balance deficit in the region ranges between approximately 46,601 m³/d in 2019 during dry conditions, to a maximum of approximately 78,372m³/d in 2044 during dry conditions. During the options assessment stage, a total of 947 unconstrained options were assessed. Of these, 416 options were screened out for the reasons summarised in Table 4.5 and recorded in Annex B.

Table 4.5 Rejected Options Summary

No. of Options	Reason for Rejection
148	Resilience, Deliverability, Flexibility & Sustainability
147	Deliverability & Flexibility
121	Other

The remaining 531 feasible options are categorised into options that resolve the need for one WRZ only “WRZ options” and options that resolved the need for more than one WRZ “Study Area options”. Table 4.6 provides an overview of the number of WRZ options and Study Area options for the WRZs in Study Area I. From this table it can be noted that there are 158 WRZ Options and 373 options which can be merged to form 96 Study Area Options.

A summary of the number of options and whether they are WRZ or SA options is contained in Table 4.6.

Table 4.6 SAI Feasible Options Summary

WRZ Name	WRZ Code	Option Type	
		WRZ Option	SA Grouped Option
Adrigole	0500SC0033	5	6
Allihies	0500SC0035	2	2
Aghabullogue	0500SC0059	2	5
Ard Na Killy Ridge	0500SC0019	2	0
Ballinagree	0500SC0073	2	8
Ballincurrig Lisgoold	0500SC0167	1	4
Ballingeary	0500SC0009	3	0

WRZ Name	WRZ Code	Option Type	
		WRZ Option	SA Grouped Option
Ballykilty	0500SC0084	1	9
Ballymacoda	0500SC0041	3	7
Ballymakeera	0500SC0070	5	1
Ballyshoneen	0500SC0172	1	2
Ballyverane	0500SC0180	2	2
Bandon Regional	0500SC0145	1	11
Bantry	0500SC0030	4	13
Bayview	0500SC0152	0	14
Bilberry	0500SC0157	1	1
Caheragh	0500SC0028	1	0
Caherdaniel / Castlecove	1300SC0017	0	1
Cahermore	0500SC0036	2	1
Cape Clear	0500SC0155	1	0
Carrignadoura	0500SC0010	1	0
Carrignavar	0500SC0050	1	2
Castletownbere	0500SC0034	3	8
Clash Leamleara	0500SC0048	1	4
Clashanamid	0500SC0146	2	2
Clonakilty	0500SC0153	4	19
Clondrohid	0500SC0071	2	2
Cloyne	0500SC0158	2	2
Cluain Court Allihies	0500SC0170	1	1
Coolineagh	0500SC0058	1	4
Coolyhane	0500SC0178	1	2
Coppeen	0500SC0168	1	0
Corbally	0500SC0047	1	5
Cork City	0500SC0082	10	45
Crookhaven	0500SC0025	1	1

WRZ Name	WRZ Code	Option Type	
		WRZ Option	SA Grouped Option
Croterra	0500SC0069	1	3
Cullen	0500SC0020	1	2
Donoughmore	0500SC0057	2	1
Drinagh	0500SC0038	1	1
Dromore Bantry	0500SC0029	1	2
Dungourney	0500SC0044	1	1
Dunmanway	0500SC0012	5	3
Durrus	0500SC0027	2	5
Durse Island	0500SC0037	1	0
Glengarriff	0500SC0068	2	9
Goleen	0500SC0024	2	1
Grenagh	0500SC0055	4	3
Inch	0500SC0043	2	1
Inchigeelagh	0500SC0008	1	0
Johnstown	0500SC0169	1	0
Kealkill	0500SC0183	1	3
Kenmare / Kilgarvan	1300SC0019	3	0
Kilcraheen	0500SC0040	2	5
Kilcrohane	0500SC0026	1	3
Kilgarvan	1300SC0029	1	0
Killeagh	0500SC0085	2	6
Kilnagurteen Macroom	0500SC0179	1	2
Kilnamartyra	0500SC0078	1	0
Knockadoon	0500SC0039	1	7
Knockanleigh	0500SC0095	1	0
Knockburden	0500SC0171	1	2
Lauragh	1300SC0027	5	1
Lyre Clonakilty	0500SC0154	1	1

WRZ Name	WRZ Code	Option Type	
		WRZ Option	SA Grouped Option
Macroon	0500SC0177	1	7
Midleton	0500SC0159	1	12
Minane Bridge	0500SC0083	1	2
Mogeely	0500SC0162	3	6
Mossgrove	0500SC0014	1	1
Newcestown	0500SC0013	1	1
Nohoval	0500SC0017	1	2
Ratharoon	0500SC0147	1	0
Reenmeen West	0500SC0181	1	8
Roberts Cove	0500SC0016	2	2
Rylane	0500SC0074	1	8
Skibbereen 1 - Ballyhilty and Drimoleague	0500SC0173	0	15
Skibbereen 2 - Baltimore and Schull	0500SC0021	1	11
Sneem	1300SC0018	1	0
Stoneview Blarney	0500SC0053	1	3
Tarelton	0500SC0007	1	0
Templemartin & Garranes	0500SC0081	1	2
Tibbotstown	0500SC0161	2	9
Toormore	0500SC0023	1	5
Vicarstown	0500SC0054	1	2
Walshtown	0500SC0046	2	3
Waterville	1300SC0023	1	1
Whiddy Island	0500SC0031	3	2
Whitechurch	0500SC0051	2	1
Whitegate Regional	0500SC0184	2	9
Youghal Regional	0500SC0042	6	15



5

Approach Development

5 Approach Development

This chapter describes how we tested different combinations of the Feasible Options to develop a Preferred Approach to meet the needs we identified for the WRZ in Study Area I.

5.1 Approach Development

5.1.1 Introduction to Approach Development

The purpose of the NWRP is to examine all potential options that could be used to resolve issues within the water supply (unconstrained options) and then to eliminate those that are not feasible or that have identifiable environmental issues at a desktop level (options assessment screening). Of the remaining feasible options Irish Water's next step is to assess a specified number of approaches to resolve need across the Study Area. An approach is a way of configuring an option or options to meet the deficit focused on a particular outcome. For example, a "Least Carbon" would be the option or combination of options that would involve the least embodied and operational carbon load over the lifetime of the option. As part of the NWRP, Irish Water considers six approaches, as summarised in Table 5.1.

These six approaches have been outlined at Section 8.3.7 of the Framework Plan, and were consulted as part of the SEA Scoping consultation conducted between 9th November 2017 and 22nd December 2017. The approaches have been specifically chosen to ensure that the NWRP aligns with all the relevant Government Policies outlined in Table 5.1.

Table 5.1 The Six Approaches

Approaches Tested	Description	Policy Driver
Least Cost	Lowest Net Present Value (NPV) cost in terms of Capital, Operational, Environmental, Social and Carbon Costs.	Public Spending Code
Best Appropriate Assessment (AA)	Lowest score against the European Sites (Biodiversity) sub-criteria question: Score = 0 equates to no likely significant effects (LSEs). If, in our opinion, 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. Score = -3 equates to LSEs that may be harder to mitigate or require significant Project Level assessment.	Habitats Directive

Approaches Tested	Description	Policy Driver
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 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 Water Framework Directive
Most Resilient	This is the option or combination of options with the highest total score against the resilience criteria.	National Adaptation Framework and Climate Action Plan
Lowest Carbon	This is the option or combination of options with the lowest embodied and operational carbon cost.	Climate Action Plan

We then compare the options identified as the best performing within each of the six approach criteria (Least Cost, Best AA, Lowest Carbon etc.) against each other as outlined in Figure 5.1 to come up with a Preferred Approach that meets the objectives of the Framework Plan and aligns with all relevant Government Policy.

STEP 0 Best AA	If there is an option that meets the Objectives of the Plan, and is assessed as having no potential impact on a European Site (based on desktop assessment), it is automatically adopted as the Preferred Approach
STEP 1 Least Cost	Compare Least Cost against best AA Approach, and consider again at Step 6
STEP 2 Quickest Delivery	Compare Least Cost against Quickest Delivery Approach and develop Modified Approach if appropriate
STEP 3 Best Environmental	Compare Least Cost or Modified Approach against Best Environmental, and modify approach if appropriate
STEP 4 Most Resilient	Compare Least Cost or Modified Approach against Most Resilient
STEP 5 Least Carbon	Compare Least Cost or Modified Approach against Lowest Carbon
STEP 6 Approach Comparison	Compare output from Steps 1 to 5 against: <ul style="list-style-type: none"> • SEA required outcomes • Best AA outcomes • Sectoral Adaptation Outcomes • Public Expenditure Code Outcomes
STEP 7 Preferred Approach	Select Preferred Approach based on steps 0 to 6

Figure 5.1 Figure of the 7 step assessment process

This methodology which is further detailed in Chapter 7 of the RWRP-SW follows a process to develop the Preferred Approach for a Study Area across three stages;

- **Stage 1** – We assess the water resource zones individually to develop an initial Preferred Approach, the **WRZ Preferred Approach** for all of the supplies in the Study Area
- **Stage 2** – We assess whether there are any larger options that might resolve deficits across multiple WRZs within a Study Area. We then develop combinations of these options (SA Combinations).
- **Stage 3** – We assess the SA Combinations and the WRZ Level approach in order to determine the best performing combination. This is known as the Preferred Approach at SA Level.

At each stage of assessment as detailed above, we carry out an assessment of the cumulative and in-combination effects of the Preferred Approach as detailed in the SEA Environmental Report for the RWRP-SW and the Environmental Review for this Study Area.

Within the Regional Plan, we will examine the Preferred Approach at a third spatial level for the entire South West Strategic Study Areas and will make any required changes in order to develop a Preferred Approach across the entire Region.

Further details on these three stages is provided in Chapter 7 of the RWRP-SW. Section 5.2 provides an overview of the application of this process to SAI.

5.2 Preferred Approach Development Process for Study Area I

5.2.1 Stage 1 – WRZ Level Approach

As outlined in Section 4.4 of this Technical Report there are 531 feasible options. 158 of these options are WRZ Options while 373 options are merged to form 96 Study Area Options. Table 5.2 outlines the 158 WRZ options for SAI, providing option reference numbers and detailing the WRZs they provide a solution to. These solutions are presented as “Options” for the purposes of this plan; however, will be subject to their own regulatory, timing and budgetary constraints.

Due to the rural isolated nature of the WRZs in SAI there are 4 WRZs with no feasible local solutions namely: Clonakilty, Bayview, Skibbereen 2 and Caherdaniel/ Castlecove. Unconstrained options were considered for these WRZs; however, all unconstrained options were considered unfeasible at the screening stage.

For example, in Skibbereen 2 a WRZ option of increasing the existing abstraction was considered, however, the existing abstraction is already significantly greater than theoretical future permissible abstraction and locally the operations staff have noted that water levels in the lake have dropped in recent years. Therefore, this option was not considered feasible at coarse screening stage.

Table 5.2 SAI Feasible Options

Water Resource Zone Name	Feasible Options SAI	
	Option Code	Option Description
Adrigole	SAI-423	New SW abstraction from Trafask (Stream) and new WTP.
Adrigole	SAI-424	New SW abstraction from Coomadayallig Lake and new WTP.
Adrigole	SAI-425	New SW abstraction from Coomarkane Lake and new WTP.
Adrigole	SAI-426	New SW abstraction from Adrigole River and upgrade WTP.
Adrigole	SAI-672	New SW abstraction from Glenceel Lough to supply deficit.
Aghabullogue	SAI-035	Increase GW abstraction and upgrade Aghabullogue WTP.
Aghabullogue	SAI-037	New SW from Delehinagh River and new WTP.
Allihies	SAI-475	Interconnect Allihies WRZ with Ballydonegan GWS (GW) and supply deficit.
Allihies	SAI-741	Rationalise Allihies WRZ to Ballydonegan GWS (GW).
Ard Na Killy Ridge	SAI-050	Increase GW abstraction and upgrade Ard Na Killy WTP.
Ard Na Killy Ridge	SAI-051	New GW abstraction and upgrade WTP.
Ballinagree	SAI-068	Increase GW abstraction and upgrade Ballinagree WTP.
Ballinagree	SAI-069	New GW abstraction and upgrade Ballinagree WTP.
Ballincurrag Lisgoold	SAI-286	Increase GW abstraction to supply deficit.
Ballingeary	SAI-060	Increase SW from Bunsheelin River and upgrade WTP.
Ballingeary	SAI-063	New trial well at Ballingeary and new WTP.
Ballingeary	SAI-064	New SW abstraction from Lough Allua and new WTP. Abandon existing WTP.
Ballykilty	SAI-264	New GW abstraction in the karstic region south of Ballykilty WTP to supply deficit.

Water Resource Zone Name	Feasible Options SAI	
	Option Code	Option Description
Ballymacoda	SAI-242	New GW abstraction in the karstic region north of Ballymacoda WTP.
Ballymacoda	SAI-245	Increase existing GW abstraction to supply deficit.
Ballymacoda	SAI-248	New SW abstraction from Womanagh River.
Ballymakeera	SAI-009	Increase GW abstraction (infiltration gallery) and upgrade Ballymakeera WTP.
Ballymakeera	SAI-010	New GW abstraction and upgrade Ballymakeera WTP.
Ballymakeera	SAI-011	New SW abstraction from River Sullane and upgrade Ballymakeera WTP.
Ballymakeera	SAI-012	New SW abstraction from River Douglas and upgrade Ballymakeera WTP.
Ballymakeera	SAI-013	New SW abstraction from River Finnow and new Ballymakeera WTP.
Ballyshoneen	SAI-283	Increase existing GW abstraction at Ballyshoneen and supply deficit.
Ballyverane	SAI-123	Increase GW abstraction and upgrade WTP.
Ballyverane	SAI-124	New GW abstraction at Ballyverane and upgrade WTP.
Bandon Regional	SAI-001	Increase SW abstraction from Bandon River and upgrade WTP.
Bantry	SAI-375	New SW abstraction from Coomhola River and new WTP.
Bantry	SAI-376	New SW abstraction from Owvane River and new WTP.
Bantry	SAI-661	New Inchybegga Impoundment (Cullomane) and new WTP.
Bantry	SAI-678	New SW abstraction from Mealagh River, New WTP to supply deficit to Bantry WRZ.
Bilberry	SAI-781	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Caheragh	SAI-772	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Cahermore	SAI-478	New SW abstraction from Cloghane River and upgrade WTP.
Cahermore	SAI-480	New GW abstraction to supply deficit and upgrade WTP. Abandon existing SW source.
Cape Clear	SAI-780	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Carrignadoura	SAI-102	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Carrignavar	SAI-273	Increase existing GW abstraction and supply deficit.
Castletownbere	SAI-385	New SW abstraction from Barley lake and new WTP. Supply deficit to Castletownbere WRZ.
Castletownbere	SAI-390	New SW abstraction at Glenmore Lake and new WTP.
Castletownbere	SAI-685	Desalination plant at Castletownbere WRZ.
Clash Leamleara	SAI-277	Increase GW abstraction from Clash Borewell to supply deficit.
Clashanamid	SAI-106	Increase GW abstraction and upgrade Clashanamid WTP.
Clashanamid	SAI-107	New GW abstraction and upgrade Clashanamid WTP.
Clonakilty	SAI-656*	Relocate intake on Argideen further downstream (Kilmalooda Bridge, old intake site) and upgrade Clonakilty (Jones Bridge) WTP.
Clonakilty	SAI-657*	Relocate intake on Argideen further downstream (Proposed Kilmalooda - downstream of river junction) and upgrade Clonakilty (Jones Bridge) WTP.
Clonakilty	SAI-658*	New bankside storage at Cambells Pit (local quarry) and upgrade Clonakilty (Jones Bridge) WTP.
Clonakilty	SAI-659*	Relocate intake on Argideen further downstream (existing old Kilmalooda abstraction - original intake position) and upgrade Clonakilty (Jones Bridge) WTP.
Clondrohid	SAI-030	Increase GW abstraction and upgrade Clondrohid WTP.
Clondrohid	SAI-031	New GW abstraction and upgrade Clondrohid WTP.
Cloyne	SAI-192	Increase GW abstraction and supply deficit.
Cloyne	SAI-193	New GW abstraction (karstic region) and new WTP to supply deficit.

Water Resource Zone Name	Feasible Options SAI	
	Option Code	Option Description
Cluain Court Allihies	SAI-523	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Coolineagh	SAI-140	Increase GW abstraction and upgrade WTP.
Coolyhane	SAI-040	Increase GW abstraction and upgrade Coolyhane WTP.
Coppeen	SAI-486	Increase GW abstraction at Coppeen Source to supply deficit and upgrade Coppeen WTP.
Corbally	SAI-257	Increase GW abstraction to supply deficit.
Cork City	SAI-527	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP.
Cork City	SAI-560	Increase SW abstraction from River Lee and upgrade Lee Road WTP.
Cork City	SAI-563	New GW abstraction in karstic region around Ballincollig. New WTP required to partly supply deficit.
Cork City	SAI-564	New GW abstraction in sand and gravel region west of Ballincollig to partly supply deficit.
Cork City	SAI-565	New GW abstraction in Karstic region around Carrigtohill and new WTP to partly supply deficit.
Cork City	SAI-576	New GW abstraction and new WTP in the area of Curraheen Spring.
Cork City	SAI-577	New GW abstraction in the karstic region in Ringaskiddy and new WTP to partly supply deficit.
Cork City	SAI-580	Desalination plant for Cork City at Ringaskiddy.
Cork City	SAI-581	New desalination plant and use incinerator as energy source for Cork City (location TBC).
Cork City	SAI-764	New abstraction at Carridrohid Reservoir, gravity main to Inniscarra and upgrade Inniscarra WTP to supply deficit. Also upgrade existing abstraction at Inniscarra Reservoir.
Crookhaven	SAI-784	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Croterra	SAI-468	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Cullen	SAI-114	Increase GW abstraction from Cullen BH and upgrade WTP.
Donoughmore	SAI-212	New GW abstraction and upgrade WTP to supply deficit.
Donoughmore	SAI-213	New SW abstraction from Shournagh River.
Drinagh	SAI-433	Increase SW abstraction from Curraghlicky Lake and upgrade WTP.
Dromore Bantry	SAI-455	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Dungourney	SAI-291	New GW abstraction to supply deficit.
Dunmanway	SAI-393	New SW abstraction from Cullenagh Lake.
Dunmanway	SAI-394	New SW abstraction from Garranes Lake.
Dunmanway	SAI-395	New SW abstraction from Ballynacarriga Lough.
Dunmanway	SAI-398	New SW abstraction from Curraghlicky Lake and new WTP.
Dunmanway	SAI-401	New SW abstraction from Bandon River and upgrade WTP.
Durrus	SAI-439	New SW abstraction from Glan Lough and new WTP.
Durrus	SAI-442	Increase GW abstraction to supply deficit and upgrade WTP.
Dursey Island	SAI-768	New raw water storage for this WRZ. Based on requiring 100 days' supply of 13m ³ /d deficit.
Glengarriff	SAI-404	New SW abstraction from Glengarriff River and new WTP onsite.
Glengarriff	SAI-708	New SW abstraction and new WTP on the Glengarriff River and abandon existing WTP on Barony River.
Goleen	SAI-457	Increase SW abstraction from Goleen Intake and upgrade Goleen WTP. Significant reduction in yield in 2018.
Goleen	SAI-459	New SW abstraction from Konockeennagearagh Lough and upgrade WTP.

Water Resource Zone Name	Feasible Options SAI	
	Option Code	Option Description
Grenagh	SAI-216	Increase GW abstraction to partly supply deficit.
Grenagh	SAI-217	New GW abstraction to partly supply deficit.
Grenagh	SAI-218	New SW abstraction from Manin River.
Grenagh	SAI-221	Interconnect Grenagh WRZ with Ballyglass GWS (GW source) to partly supply deficit.
Inch	SAI-324	Increase existing GW abstraction from spring and supply deficit.
Inch	SAI-325	New GW abstraction to supply deficit.
Inchigeelagh	SAI-771	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Johnstown	SAI-526	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Kealkill	SAI-410	New SW abstraction from Coomhola River and new WTP.
Kenmare / Kilgarvan	SAI-628	New GW abstraction - Karstic Geology - New WTP required.
Kenmare / Kilgarvan	SAI-630	New SW abstraction from Kenmare River and new WTP.
Kenmare / Kilgarvan	SAI-632	New abstraction at River Sheen.
Kilcraheen	SAI-294	New GW abstraction in the karstic region to supply deficit.
Kilcraheen	SAI-299	New SW abstraction from Womanagh River to supply deficit.
Kilcrohane	SAI-660	New GW abstraction and abandon existing GW source. New WTP.
Kilgarvan	SAI-645	New GW abstraction - Karstic Geology - Upgrade WTP.
Killeagh	SAI-222	Increase GW abstraction (karstic) and supply deficit.
Killeagh	SAI-224	New SW abstraction from Womanagh River.
Kilnagurteen Macroom	SAI-769	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Kilnamartyra	SAI-774	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Knockadoon	SAI-315	New GW abstraction in the karstic region north of Knockadoon WTP and supply deficit.
Knockanleigh	SAI-146	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Knockburden	SAI-111	New GW abstraction in Knockburden and upgrade Knockburden WTP.
Lauragh PWS	SAI-647	Increase GW abstraction from source Lauragh WTP BH1 (poorly productive aquifer) and upgrade existing Lauragh WTP to supply deficit.
Lauragh PWS	SAI-649	New GW onsite as resilience.
Lauragh PWS	SAI-650	New surface water abstraction from Ahadav stream - Was original source now WRZ is fed from single BH - 5m ³ /hr - Disused Source.
Lauragh PWS	SAI-652	New SW abstraction from Glenmore Lake and upgrade WTP
Lauragh PWS	SAI-655	New GW source on existing site.
Lyre Clonakilty	SAI-779	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Macroom	SAI-770	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Midleton	SAI-782	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Minane Bridge	SAI-776	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. New infiltration gallery recommended.
Mogeely	SAI-230	Increase existing GW abstraction from infiltration gallery and supply deficit.
Mogeely	SAI-232	New GW abstraction in Mogeely and new WTP.
Mogeely	SAI-238	New SW abstraction from Womanagh River and new WTP.
Mossgrove	SAI-103	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.

Water Resource Zone Name	Feasible Options SAI	
	Option Code	Option Description
Newcestown	SAI-085	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Nohoval	SAI-054	Increase GW abstraction and upgrade Nohoval WTP.
Ratharoon	SAI-778	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Reenmeen West	SAI-489	Increase GW abstraction from Reenmeen West and upgrade Reenmeen Woods WTP.
Roberts Cove	SAI-088	Increase GW abstraction and upgrade Roberts Cove WTP.
Roberts Cove	SAI-090	New SW abstraction from Doonavanig River and new WTP. Abandon existing WTP.
Rylane	SAI-094	Upgrade WTP for water quality improvements. Currently not in deficit.
Skibbereen 2 - Baltimore and Schull	SAI-363	New SW abstraction from Rathruane River and new WTP.
Sneem PWS	SAI-643	Increase SW abstraction from Lough Dromtine.
Stoneview Blarney	SAI-307	Increase GW abstraction and supply deficit.
Tarelton	SAI-508	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Templemartin & Garranes	SAI-775	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Tibbotstown	SAI-150	New GW abstraction in Tibbotstown (karstic) to supply deficit.
Tibbotstown	SAI-154	New SW abstraction from the River Blackwater and new WTP.
Toormore	SAI-498	New GW abstraction and upgrade Toormore WTP to supply deficit.
Vicarstown	SAI-773	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Walshtown	SAI-303	Increase existing GW abstraction and supply deficit.
Walshtown	SAI-304	New GW abstraction to supply deficit.
Waterville PWS 075H	SAI-783	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Whiddy Island	SAI-450	New GW abstraction on the island to supply deficit.
Whiddy Island	SAI-698	Desalination plant and new raw water storage to supply Whiddy Island.
Whiddy Island	SAI-965	Rationalise Whiddy Island to Bantry via submarine pipeline.
Whitechurch	SAI-239	Increase GW abstraction to supply deficit.
Whitechurch	SAI-240	New GW abstraction in Whitechurch to supply deficit.
Whitegate Regional	SAI-176	Increase GW abstraction from Dower Springs and supply deficit. New WTP.
Whitegate Regional	SAI-182	New GW abstraction and new WTP to supply deficit.
Youghal Regional	SAI-163	New GW abstraction (karstic) and new WTP to partly supply deficit.
Youghal Regional	SAI-169	New SW abstraction from the River Blackwater and new WTP.
Youghal Regional	SAI-750	New GW abstraction (karstic) and new WTP to partly supply deficit.
Youghal Regional	SAI-751	Conjunctive use of new GW abstraction (karstic) and Womanagh River.
Youghal Regional	SAI-765	New GW abstraction form Dungarvan GWB to supply deficit in Youghal WRZ and new WTP.
Youghal Regional	SAI-766	New GW abstraction form Tallow GWB to supply deficit in Youghal WRZ and new WTP.

*Note: These WRZ Approaches cannot address the long term deficits in Clonakilty but might be required, in the interim, to partially address immediate issue in the area before the long term approach preferred approach can be delivered.

The WRZ options are then assessed against the six approach types, outlined in Table 5.1 and the result of this process is provided in Table 5.3.

Table 5.3 SA7 Alignment of WRZ Option/s with Approach Categories

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
Adrigole	5	TG2-SAI-423	New SW abstraction from Trafask (Stream) and new WTP.	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-
		TG2-SAI-424	New SW abstraction from Coomadayallig Lake and new WTP.	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
		TG2-SAI-425	New SW abstraction from Coomarkane Lake and new WTP.	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-
		TG2-SAI-426	New SW abstraction from Adrigole River and upgrade WTP.	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-
		TG2-SAI-672	New SW abstraction from Glenceel Lough to supply deficit.	-	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>
Aghabullogue	2	TG2-SAI-035	Increase GW abstraction and upgrade Aghabullogue WTP.	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-
		TG2-SAI-037	New SW from Delehinagh River and new WTP.	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>
Allihies	2	TG2-SAI-475	Interconnect Allihies WRZ with Ballydonegan GWS (GW) and supply deficit.	-	-	-	-	<input type="checkbox"/>	<input type="checkbox"/>
		TG2-SAI-741	Rationalise Allihies WRZ to Ballydonegan GWS (GW).	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Ard Na Killy Ridge	2	TG2-SAI-050	Increase GW abstraction and upgrade Ard Na Killy WTP.	<input type="checkbox"/>					
		TG2-SAI-051	New GW abstraction and upgrade WTP.	-	-	<input type="checkbox"/>	-	-	-
Ballinagree	2	TG2-SAI-068	Increase GW abstraction and upgrade Ballinagree WTP.	<input type="checkbox"/>					
		TG2-SAI-069	New GW abstraction and upgrade Ballinagree WTP.	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-
Ballincurrig Lisgoold	1	TG2-SAI-286	Increase GW abstraction to supply deficit.	<input type="checkbox"/>					
Ballingeary	3	TG2-SAI-060	Increase SW from Bunsheelin River and upgrade WTP.	<input type="checkbox"/>	-				
		TG2-SAI-063	New trial well at Ballingeary and new WTP.	-	-	<input type="checkbox"/>	-	-	-

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
		TG2-SAI-064	New SW abstraction from Lough Allua and new WTP. Abandon existing WTP.	-	-	☐	-	-	☐
Ballykilty	1	TG2-SAI-264	New GW abstraction in the karstic region south of Ballykilty WTP to supply deficit.	☐	☐	☐	☐	☐	☐
Ballymacoda	3	TG2-SAI-242	New GW abstraction in the karstic region north of Ballymacoda WTP.	-	-	-	-	-	-
		TG2-SAI-245	Increase existing GW abstraction to supply deficit.	☐	☐	☐	☐	☐	-
		TG2-SAI-248	New SW abstraction from Womanagh River.	-	-	-	-	-	☐
Ballymakeera	5	TG2-SAI-009	Increase GW abstraction (infiltration gallery) and upgrade Ballymakeera WTP.	-	-	☐	-	-	-
		TG2-SAI-010	New GW abstraction and upgrade Ballymakeera WTP.	-	☐	-	☐	-	-
		TG2-SAI-011	New SW abstraction from River Sullane and upgrade Ballymakeera WTP.	☐	-	-	-	☐	☐
		TG2-SAI-012	New SW abstraction from River Douglas and upgrade Ballymakeera WTP.	-	-	☐	-	-	-
		TG2-SAI-013	New SW abstraction from River Finnow and new Ballymakeera WTP.	-	-	-	-	-	-
Ballyshoneen	1	TG2-SAI-283	Increase existing GW abstraction at Ballyshoneen and supply deficit.	☐	☐	☐	☐	☐	☐
Ballyverane	2	TG2-SAI-123	Increase GW abstraction and upgrade WTP.	☐	☐	☐	☐	☐	☐
		TG2-SAI-124	New GW abstraction at Ballyverane and upgrade WTP.	-	-	☐	-	☐	-
Bandon Regional	1	TG2-SAI-001	Increase SW abstraction from Bandon River and upgrade WTP.	☐	☐	☐	☐	☐	☐
Bantry	4	TG2-SAI-375	New SW abstraction from Coomhola River and new WTP.	-	-	☐	-	-	☐

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
		TG2-SAI-376	New SW abstraction from Owwane River and new WTP.	☐	☐	☐	☐	☐	☐
		TG2-SAI-661	New Inchybegga Impoundment (Cullomane) and new WTP.	-	-	☐	-	-	-
		TG2-SAI-678	New SW abstraction from Mealagh River, New WTP to supply deficit to Bantry WRZ.	-	-	☐	-	-	-
Bilberry	1	TG2-SAI-781	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Caheragh	1	TG2-SAI-772	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Cahermore	2	TG2-SAI-478	New SW abstraction from Cloghane River and upgrade WTP.	-	-	☐	-	☐	☐
		TG2-SAI-480	New GW abstraction to supply deficit and upgrade WTP. Abandon existing SW source.	☐	☐	-	☐	-	-
Cape Clear	1	TG2-SAI-780	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Carrignadoura	1	TG2-SAI-102	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Carrignavar	1	TG2-SAI-273	Increase existing GW abstraction and supply deficit.	☐	☐	☐	☐	☐	☐
Castletownbere	3	TG2-SAI-385	New SW abstraction from Barley lake and new WTP. Supply deficit to Castletownbere WRZ.	-	-	-	-	-	-
		TG2-SAI-390	New SW abstraction at Glenmore Lake and new WTP.	-	☐	☐	☐	-	-
		TG2-SAI-685	Desalination plant at Castletownbere WRZ.	☐	-	-	-	☐	☐
Clash Leamleara	1	TG2-SAI-277	Increase GW abstraction from Clash Borewell to supply deficit.	☐	☐	☐	☐	☐	☐

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
Clashanamid	2	TG2-SAI-106	Increase GW abstraction and upgrade Clashanamid WTP.	☐	-	☐	-	-	☐
		TG2-SAI-107	New GW abstraction and upgrade Clashanamid WTP.	-	☐	☐	☐	☐	-
Clonakilty	4	TG2-SAI-656	Relocate intake on Argideen further downstream (Kilmalooda Bridge, old intake site) and upgrade Clonakilty (Jones Bridge) WTP.	-	-	-	-	-	-
		TG2-SAI-657	Relocate intake on Argideen further downstream (Proposed Kilmalooda - downstream of river junction) and upgrade Clonakilty (Jones Bridge) WTP.	-	-	-	-	-	-
		TG2-SAI-658	New bankside storage at Cambells Pit (local quarry) and upgrade Clonakilty (Jones Bridge) WTP.	-	-	-	-	-	-
		TG2-SAI-659	Relocate intake on Argideen further downstream (existing old Kilmalooda abstraction - original intake position) and upgrade Clonakilty (Jones Bridge) WTP.	-	-	-	-	-	-
Clondrohid	2	TG2-SAI-030	Increase GW abstraction and upgrade Clondrohid WTP.	-	-	☐	☐	☐	☐
		TG2-SAI-031	New GW abstraction and upgrade Clondrohid WTP.	☐	☐	☐	☐	-	-
Cloyne	2	TG2-SAI-192	Increase GW abstraction and supply deficit.	-	-	☐	-	☐	-
		TG2-SAI-193	New GW abstraction (karstic region) and new WTP to supply deficit.	☐	☐	-	☐	-	☐
Cluain Court Allihies	1	TG2-SAI-523	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Coolineagh	1	TG2-SAI-140	Increase GW abstraction and upgrade WTP.	☐	☐	☐	☐	☐	☐
Coolyhane	1	TG2-SAI-040	Increase GW abstraction and upgrade Coolyhane WTP.	☐	☐	☐	☐	☐	☐

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
Coppeen	1	TG2-SAI-486	Increase GW abstraction at Coppeen Source to supply deficit and upgrade Coppeen WTP.	☐	☐	☐	☐	☐	☐
Corbally	1	TG2-SAI-257	Increase GW abstraction to supply deficit.	☐	☐	☐	☐	☐	☐
Cork City	10	TG2-SAI-527	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP.	☐	☐	☐	☐	☐	-
		TG2-SAI-560	Increase SW abstraction from River Lee and upgrade Lee Road WTP.	-	-	-	-	-	-
		TG2-SAI-563	New GW abstraction in karstic region around Ballincollig. New WTP required to partly supply deficit.	-	-	-	-	-	-
		TG2-SAI-564	New GW abstraction in sand and gravel region west of Balincollig to partly supply deficit.	-	-	-	-	-	-
		TG2-SAI-565	New GW abstraction in Karstic region around Carrigtohill and new WTP to partly supply deficit.	-	-	-	-	-	-
		TG2-SAI-576	New GW abstraction and new WTP in the area of Curraheen Spring.	-	-	-	-	-	-
		TG2-SAI-577	New GW abstraction in the karstic region in Ringaskiddy and new WTP to partly supply deficit.	-	-	-	-	-	-
		TG2-SAI-580	Desalination plant for Cork City at Ringaskiddy.	-	-	-	-	-	☐
		TG2-SAI-581	New desalination plant and use incinerator as energy source for Cork City (location TBC).	-	-	-	-	-	☐
		TG2-SAI-764	New abstraction at Carrigdrohid Reservoir, gravity main to Inniscarra and upgrade Inniscarra WTP to supply deficit. Also upgrade existing abstraction at Inniscarra Reservoir.	-	-	☐	-	-	-

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
Crookhaven	1	TG2-SAI-784	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Crosterra	1	TG2-SAI-468	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Cullen	1	TG2-SAI-114	Increase GW abstraction from Cullen BH and upgrade WTP.	☐	☐	☐	☐	☐	☐
Donoughmore	2	TG2-SAI-212	New GW abstraction and upgrade WTP to supply deficit.	☐	☐	☐	☐	☐	-
		TG2-SAI-213	New SW abstraction from Shournagh River.	-	-	-	-	-	☐
Drinagh	1	TG2-SAI-433	Increase SW abstraction from Curraghlicky Lake and upgrade WTP.	☐	☐	☐	☐	☐	☐
Dromore Bantry	1	TG2-SAI-455	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Dungourney	1	TG2-SAI-291	New GW abstraction to supply deficit.	☐	☐	☐	☐	☐	☐
Dunmanway	5	TG2-SAI-393	New SW abstraction from Cullenagh Lake.	☐	-	☐	-	☐	☐
		TG2-SAI-394	New SW abstraction from Garranes Lake.	-	-	☐	-	-	☐
		TG2-SAI-395	New SW abstraction from Ballynacarriga Lough.	-	-	-	-	-	☐
		TG2-SAI-398	New SW abstraction from Curraghlicky Lake and new WTP.	-	☐	☐	☐	-	☐
		TG2-SAI-401	New SW abstraction from Bandon River and upgrade WTP.	-	-	-	-	-	☐
Durrus	2	TG2-SAI-439	New SW abstraction from Glan Lough and new WTP.	-	-	☐	☐	☐	☐
		TG2-SAI-442	Increase GW abstraction to supply deficit and upgrade WTP.	☐	☐	☐	☐	-	-
Dursey Island	1	TG2-SAI-768	New raw water storage for this WRZ. Based on requiring 100 days' supply of 13m ³ /d deficit.	☐	☐	☐	☐	☐	☐
Glengarriff	2	TG2-SAI-404	New SW abstraction from Glengarriff River and new WTP onsite.	☐	☐	☐	-	☐	☐

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
		TG2-SAI-708	New SW abstraction and new WTP on the Glengarriff River and abandon existing WTP on Barony River	-	☐	☐	☐	-	-
Goleen	2	TG2-SAI-457	Increase SW abstraction from Goleen Intake and upgrade Goleen WTP. Significant reduction in yield in 2018.	☐	☐	-	-	☐	-
		TG2-SAI-459	New SW abstraction from Konockeennagearagh lough and upgrade WTP.	-	-	☐	☐	-	☐
Grenagh	4	TG2-SAI-216	Increase GW abstraction to partly supply deficit.	☐	☐	☐	-	-	-
		TG2-SAI-217	New GW abstraction to partly supply deficit.	-	☐	☐	-	☐	-
		TG2-SAI-218	New SW abstraction from Manin River.	-	-	-	-	-	☐
		TG2-SAI-221	Interconnect Grenagh WRZ with Ballyglass GWS (GW source) to partly supply deficit.	-	-	☐	☐	-	-
Inch	2	TG2-SAI-324	Increase existing GW abstraction from spring and supply deficit.	-	☐	☐	☐	-	☐
		TG2-SAI-325	New GW abstraction to supply deficit.	☐	☐	-	-	☐	-
Inchigeelagh	1	TG2-SAI-771	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Johnstown	1	TG2-SAI-526	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Kealkill	2	TG2-SAI-410	New SW abstraction from Coomhola River and new WTP.	☐	☐	☐	☐	☐	☐
Kenmare / Kilgarvan	3	TG2-SAI-628	New GW abstraction - Karstic Geology - New WTP required	-	☐	☐	-	-	-
		TG2-SAI-630	New SW abstraction from Kenmare River and new WTP	☐	-	☐	-	-	☐
		TG2-SAI-632	New abstraction at River Sheen	-	-	☐	☐	☐	-

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
Kilcraheen	2	TG2-SAI-294	New GW abstraction in the karstic region to supply deficit.	☐	☐	-	☐	☐	-
		TG2-SAI-299	New SW abstraction from Womanagh River to supply deficit.	-	-	☐	-	-	☐
Kilcrohane	1	TG2-SAI-660	New GW abstraction and abandon existing GW source. New WTP	☐	☐	☐	☐	☐	☐
Kilgarvan	1	TG2-SAI-645	New GW abstraction - Karstic Geology - Upgrade WTP	☐	☐	☐	☐	☐	☐
Killeagh	2	TG2-SAI-222	Increase GW abstraction (karstic) and supply deficit.	☐	☐	☐	☐	-	-
		TG2-SAI-224	New SW abstraction from Womanagh River.	-	-	-	☐	☐	☐
Kilnagurteen Macroom	1	TG2-SAI-769	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Kilnamartyra	1	TG2-SAI-774	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Knockadoon	1	TG2-SAI-315	New GW abstraction in the karstic region north of Knockadoon WTP and supply deficit.	☐	☐	☐	☐	☐	☐
Knockanleigh	1	TG2-SAI-146	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Knockburden	1	TG2-SAI-111	New GW abstraction in Knockburden and upgrade Knockburden WTP.	☐	☐	☐	☐	☐	☐
Lauragh PWS	5	TG2-SAI-647	Increase GW abstraction from source Lauragh WTP BH1 (poorly productive aquifer) and upgrade existing Lauragh WTP to supply deficit	-	☐	☐	-	-	-
		TG2-SAI-649	New GW onsite as resilience	-	-	☐	-	-	-
		TG2-SAI-650	New surface water abstraction from Ahadav stream - Was original source now WRZ is fed from single BH - 5m ³ /hr - Disused Source	☐	-	☐	-	☐	-

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
		TG2-SAI-652	New SW abstraction from Glenmore Lake and upgrade WTP	-	-	☐	☐	-	☐
		TG2-SAI-655	New GW source on existing site	-	-	-	-	-	-
Lyre Clonakilty	1	TG2-SAI-779	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Macroom	1	TG2-SAI-770	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Midleton	1	TG2-SAI-782	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Minane Bridge	1	TG2-SAI-776	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. New infiltration gallery recommended	☐	☐	☐	☐	☐	☐
Mogeely	3	TG2-SAI-230	Increase existing GW abstraction from infiltration gallery and supply deficit.	☐	-	-	☐	☐	-
		TG2-SAI-232	New GW abstraction in Mogeely and new WTP.	-	☐	☐	-	-	-
		TG2-SAI-238	New SW abstraction from Womanagh River and new WTP.	-	-	-	-	-	☐
Mossgrove	1	TG2-SAI-103	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Newcestown	1	TG2-SAI-085	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Nohoval	1	TG2-SAI-054	Increase GW abstraction and upgrade Nohoval WTP.	☐	☐	☐	☐	☐	☐
Ratharoon	1	TG2-SAI-778	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Reenmeen West	1	TG2-SAI-489	Increase GW abstraction from Reenmeen West and upgrade Reenmeen Woods WTP.	☐	☐	☐	☐	☐	☐

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
Roberts Cove	2	TG2-SAI-088	Increase GW abstraction and upgrade Roberts Cove WTP.	☐	☐	☐	☐	☐	-
		TG2-SAI-090	New SW abstraction from Doonavanig River and new WTP. Abandon existing WTP.	-	-	☐	-	-	☐
Rylane	1	TG2-SAI-094	Upgrade WTP for water quality improvements. Currently not in deficit.	☐	☐	☐	☐	☐	☐
Skibbereen 2 - Baltimore and Schull	1	TG2-SAI-363	New SW abstraction from Rathruane River and new WTP.	☐	☐	☐	☐	☐	☐
Sneem PWS	1	TG2-SAI-643	Increase SW abstraction from lough Dromtine	☐	☐	☐	☐	☐	☐
Stoneview Blarney	1	TG2-SAI-307	Increase GW abstraction and supply deficit.	☐	☐	☐	☐	☐	☐
Tarelton	1	TG2-SAI-508	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Templemartin & Garranes	1	TG2-SAI-775	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Tibbotstown	2	TG2-SAI-150	New GW abstraction in Tibbotstown (karstic) to supply deficit.	☐	☐	☐	☐	☐	-
		TG2-SAI-154	New SW abstraction from the River Blackwater and new WTP.	-	-	☐	-	-	☐
Toormore	1	TG2-SAI-498	New GW abstraction and upgrade Toormore WTP to supply deficit.	☐	☐	☐	☐	☐	☐
Vicarstown	1	TG2-SAI-773	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Walshtown	2	TG2-SAI-303	Increase existing GW abstraction and supply deficit.	☐	☐	☐	☐	☐	☐
		TG2-SAI-304	New GW abstraction to supply deficit.	-	-	☐	-	-	-
Waterville PWS 075H	1	TG2-SAI-783	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐
Whiddy Island	3	TG2-SAI-450	New GW abstraction on the island to supply deficit.	☐	☐	☐	-	☐	-

Water Resource Zone Name	Feasible Options SAI Cork			Approach					
	No. of WRZ Options	Option Code	Option Description	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient
		TG2-SAI-698	Desalination plant and new raw water storage to supply Whiddy Island.	-	-	-	-	-	☐
		TG2-SAI-965	Rationalise Whiddy Island to Bantry via submarine pipeline.	-	-	-	☐	-	-
Whitechurch	2	TG2-SAI-239	Increase GW abstraction to supply deficit.	☐	☐	☐	☐	☐	☐
		TG2-SAI-240	New GW abstraction in Whitechurch to supply deficit.	☐	☐	☐	☐	☐	☐
Whitegate Regional	2	TG2-SAI-176	Increase GW abstraction from Dower Springs and supply deficit. New WTP	☐	-	☐	☐	☐	☐
		TG2-SAI-182	New GW abstraction and new WTP to supply deficit.	-	☐	-	-	-	☐
Youghal Regional	6	TG2-SAI-163	New GW abstraction (karstic) and new WTP to partly supply deficit.	☐	☐	☐	-	☐	-
		TG2-SAI-169	New SW abstraction from the River Blackwater and new WTP.	-	-	☐	-	-	☐
		TG2-SAI-750	New GW abstraction (karstic) and new WTP to partly supply deficit.	-	-	-	-	-	-
		TG2-SAI-751	Conjunctive use of new GW abstraction (karstic) and Womanagh River.	-	-	-	-	-	-
		TG2-SAI-765	New GW abstraction form Dungarvan GWB to supply deficit in Youghal WRZ and new WTP.	-	-	☐	-	-	-
		TG2-SAI-766	New GW abstraction form Tallow GWB to supply deficit in Youghal WRZ and new WTP.	-	-	☐	☐	-	-

The 7 Step Process outlined in Figure 5.3 was then applied to each WRZ in SAI, in order to develop a WRZ level approach. A summary of the outcome of this assessment at WRZ level (i.e. WRZ options only) is shown in Table 5.4.

The findings of the Preferred Approach development for SA at WRZ level include the following:

- In terms of Best AA, 51 WRZ options score a 0 in relation to potential impact on a designated European Site;

- The Best AA and the Best Environmental (overall SEA score) approach is identified for 74 of the 89 WRZs;
- Of the 89 WRZ level Preferred Approaches, 4 have a -3 score against biodiversity;
- There are 4 WRZs in SAI that have no local solution, These include, Clonakilty, Bayview, Skibbereen 2 and Caherdaniel/ Castlecove.

Table 5.4 SAI WRZ Approach Options

Water Resource Zone Name	Feasible Options SAI		Approach							
	Option Code	Option Description	Zero AA	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient	Preferred Approach
Adrigole	SAI-423	New SW abstraction from Trafask (Stream) and new WTP.	-	-	☐	-	☐	-	-	☐
Aghabullogue	SAI-035	Increase GW abstraction and upgrade Aghabullogue WTP.	☐	-	☐	☐	☐	☐	-	☐
Allihies	SAI-475	Interconnect Allihies WRZ with Ballydonegan GWS (GW) and supply deficit.	-	-	-	-	-	☐	☐	☐
Ard Na Killy Ridge	SAI-050	Increase GW abstraction and upgrade Ard Na Killy WTP.	☐	☐	☐	☐	☐	☐	☐	☐
Ballinagree	SAI-068	Increase GW abstraction and upgrade Ballinagree WTP.	☐	☐	☐	☐	☐	☐	☐	☐
Ballincurrig Lisgoold	SAI-286	Increase GW abstraction to supply deficit.	☐	☐	☐	☐	☐	☐	☐	☐
Ballingeary	SAI-060	Increase SW from Bunsheelin River and upgrade WTP.	-	☐	☐	☐	☐	☐	-	☐
Ballykilty	SAI-264	New GW abstraction in the karstic region south of Ballykilty WTP to supply deficit.	-	☐	☐	☐	☐	☐	☐	☐
Ballymacoda	SAI-245	Increase existing GW abstraction to supply deficit.	☐	☐	☐	☐	☐	☐	-	☐
Ballymakeera	SAI-011	New SW abstraction from River Sullane and upgrade Ballymakeera WTP.	-	☐	-	-	-	☐	☐	☐
Ballyshoneen	SAI-283	Increase existing GW abstraction at Ballyshoneen and supply deficit.	☐	☐	☐	☐	☐	☐	☐	☐
Ballyverane	SAI-123	Increase GW abstraction and upgrade WTP.	☐	☐	☐	☐	☐	☐	☐	☐
Bandon Regional	SAI-001	Increase SW abstraction from Bandon River and upgrade WTP.	-	☐	☐	☐	☐	☐	☐	☐
Bantry	SAI-376	New SW abstraction from Owvane River and new WTP.	☐	☐	☐	☐	☐	☐	☐	☐
Bayview	No local solution									

Water Resource Zone Name	Feasible Options SAI		Approach							
	Option Code	Option Description	Zero AA	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient	Preferred Approach
Bilberry	SAI-781	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Caheragh	SAI-772	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Caherdaniel / Castlecove	No local solution									
Cahermore	SAI-480	New GW abstraction to supply deficit and upgrade WTP. Abandon existing SW source.	-	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>
Cape Clear	SAI-780	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Carrignadoura	SAI-102	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Carrignavar	SAI-273	Increase existing GW abstraction and supply deficit.	<input type="checkbox"/>							
Castletownbere	SAI-390	New SW abstraction at Glenmore Lake and new WTP.	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	<input type="checkbox"/>
Clash Leamleara	SAI-277	Increase GW abstraction from Clash Borewell to supply deficit.	<input type="checkbox"/>							
Clashanamid	SAI-107	New GW abstraction and upgrade Clashanamid WTP.	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>
Clonakilty	No local solution									
Clondrohid	SAI-031	New GW abstraction and upgrade Clondrohid WTP.	<input type="checkbox"/>	-	-	<input type="checkbox"/>				
Cloyne	SAI-193	New GW abstraction (karstic region) and new WTP to supply deficit.	-	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>
Cluain Court Allihies	SAI-523	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Coolineagh	SAI-140	Increase GW abstraction and upgrade WTP.	<input type="checkbox"/>							
Coolyhane	SAI-040	Increase GW abstraction and upgrade Coolyhane WTP.	<input type="checkbox"/>							

Water Resource Zone Name	Feasible Options SAI		Approach							
	Option Code	Option Description	Zero AA	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient	Preferred Approach
Coppeen	SAI-486	Increase GW abstraction at Coppeen Source to supply deficit and upgrade Coppeen WTP.	<input type="checkbox"/>							
Corbally	SAI-257	Increase GW abstraction to supply deficit.	<input type="checkbox"/>							
Cork City	SAI-527	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP.	<input type="checkbox"/>	-	<input type="checkbox"/>					
Crookhaven	SAI-784	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	<input type="checkbox"/>						
Crostera	SAI-468	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	<input type="checkbox"/>						
Cullen	SAI-114	Increase GW abstraction from Cullen BH and upgrade WTP.	<input type="checkbox"/>							
Donoughmore	SAI-212	New GW abstraction and upgrade WTP to supply deficit.	<input type="checkbox"/>	-	<input type="checkbox"/>					
Drinagh	SAI-433	Increase SW abstraction from Curraghlicky Lake and upgrade WTP.	<input type="checkbox"/>							
Dromore Bantry	SAI-455	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Dungourney	SAI-291	New GW abstraction to supply deficit.	<input type="checkbox"/>							
Dunmanway	SAI-393	New SW abstraction from Cullenagh Lake.	-	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Durrus	SAI-442	Increase GW abstraction to supply deficit and upgrade WTP.	<input type="checkbox"/>	-	-	<input type="checkbox"/>				
Dursey Island	SAI-768	New raw water storage for this WRZ. Based on requiring 100 days' supply of 13m ³ /d deficit.	-	<input type="checkbox"/>						
Glengarriff	SAI-708	New SW abstraction and new WTP on the Glengarriff River and abandon existing WTP on Barony River	-	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	<input type="checkbox"/>
Goleen	SAI-457	Increase SW abstraction from Goleen Intake and upgrade Goleen WTP. Significant reduction in yield in 2018.	-	<input type="checkbox"/>	<input type="checkbox"/>	-	-	<input type="checkbox"/>	-	<input type="checkbox"/>
Grenagh	SAI-216	Increase GW abstraction to partly supply deficit.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	-	-	<input type="checkbox"/>

Water Resource Zone Name	Feasible Options SAI		Approach							
	Option Code	Option Description	Zero AA	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient	Preferred Approach
Inch	SAI-324	Increase existing GW abstraction from spring and supply deficit.	☐	-	☐	☐	☐	-	☐	☐
Inchigeelagh	SAI-771	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	☐	☐	☐	☐	☐	☐	☐
Johnstown	SAI-526	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐	☐	☐
Kealkill	SAI-410	New SW abstraction from Coomhola River and new WTP.	☐	☐	☐	☐	☐	☐	☐	☐
Kenmare / Kilgarvan	SAI-630	New SW abstraction from Kenmare River and new WTP.	-	☐	-	☐	-	-	☐	☐
Kilcraheen	SAI-294	New GW abstraction in the karstic region to supply deficit.	-	☐	☐	-	☐	☐	-	☐
Kilcrohane	SAI-660	New GW abstraction and abandon existing GW source. New WTP.	-	☐	☐	☐	☐	☐	☐	☐
Kilgarvan	SAI-645	New GW abstraction - Karstic Geology - Upgrade WTP.	-	☐	☐	☐	☐	☐	☐	☐
Killeagh	SAI-222	Increase GW abstraction (karstic) and supply deficit.	☐	☐	☐	☐	☐	-	-	☐
Kilnagurteen Macroom	SAI-769	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐	☐	☐
Kilnamartyra	SAI-774	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐	☐	☐
Knockadoon	SAI-315	New GW abstraction in the karstic region north of Knockadoon WTP and supply deficit.	-	☐	☐	☐	☐	☐	☐	☐
Knockanleigh	SAI-146	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	☐	☐	☐	☐	☐	☐	☐	☐
Knockburden	SAI-111	New GW abstraction in Knockburden and upgrade Knockburden WTP.	☐	☐	☐	☐	☐	☐	☐	☐
Lauragh PWS	SAI-652	New SW abstraction from Glenmore Lake and upgrade WTP.	-	-	-	☐	☐	-	☐	☐

Water Resource Zone Name	Feasible Options SAI		Approach							
	Option Code	Option Description	Zero AA	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient	Preferred Approach
Lyre Clonakilty	SAI-779	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	<input type="checkbox"/>						
Macroom	SAI-770	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Midleton	SAI-782	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Minane Bridge	SAI-776	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit. New infiltration gallery recommended.	-	<input type="checkbox"/>						
Mogeely	SAI-230	Increase existing GW abstraction from infiltration gallery and supply deficit.	-	<input type="checkbox"/>	-	-	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>
Mossgrove	SAI-103	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Newcestown	SAI-085	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Nohoval	SAI-054	Increase GW abstraction and upgrade Nohoval WTP.	<input type="checkbox"/>							
Ratharoon	SAI-778	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Reenmeen West	SAI-489	Increase GW abstraction from Reenmeen West and upgrade Reenmeen Woods WTP.	-	<input type="checkbox"/>						
Roberts Cove	SAI-088	Increase GW abstraction and upgrade Roberts Cove WTP.	<input type="checkbox"/>	-	<input type="checkbox"/>					
Rylane	SAI-094	Upgrade WTP for water quality improvements. Currently not in deficit.	<input type="checkbox"/>							
Skibbereen 2 - Baltimore and Schull	SAI-363	New SW abstraction from Rathruane River and new WTP.	-	<input type="checkbox"/>						
Skibbereen 1 - Ballyhilty and Drimoleague	No local solution									
Sneem PWS	SAI-643	Increase SW abstraction from lough Dromtine.	-	<input type="checkbox"/>						
Stoneview Blarney	SAI-307	Increase GW abstraction and supply deficit.	<input type="checkbox"/>							

Water Resource Zone Name	Feasible Options SAI		Approach							
	Option Code	Option Description	Zero AA	Least Cost	Quickest Delivery	Best AA	Best SEA	Lowest Carbon	Most Resilient	Preferred Approach
Tarelton	SAI-508	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Templemartin & Garranes	SAI-775	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Tibbotstown	SAI-150	New GW abstraction in Tibbotstown (karstic) to supply deficit.	-	<input type="checkbox"/>	-	<input type="checkbox"/>				
Toormore	SAI-498	New GW abstraction and upgrade Toormore WTP to supply deficit.	-	<input type="checkbox"/>						
Vicarstown	SAI-773	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	<input type="checkbox"/>							
Walshtown	SAI-303	Increase existing GW abstraction and supply deficit.	<input type="checkbox"/>							
Waterville PWS 075H	SAI-783	Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.	-	<input type="checkbox"/>						
Whiddy Island	SAI-450	New GW abstraction on the island to supply deficit.	<input type="checkbox"/>	-	<input type="checkbox"/>					
Whitechurch	SAI-239	Increase GW abstraction to supply deficit.	-	<input type="checkbox"/>						
Whitechurch	SAI-240	New GW abstraction in Whitechurch to supply deficit.	-	<input type="checkbox"/>						
Whitegate Regional	SAI-176	Increase GW abstraction from Dower Springs and supply deficit. New WTP.	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>				
Youghal Regional	SAI-163	New GW abstraction (karstic) and new WTP to partly supply deficit.	-	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	-	<input type="checkbox"/>	-	<input type="checkbox"/>

Note the WRZ preferred approach for Widdy Island is to develop a new groundwater abstraction on the island to supply the required deficit. Three sites on the Island are considered potentially good locations for ground water supply and a trail well was developed on one of these sites. Results from the trail well test indicate that arsenic is evident in the groundwater, and it would not be a suitable source of raw water for

public water supply purposes. Trial tests will be carried out at the other two sites and if it is determined, further to these site investigations, that the groundwater supply is not suitable for public water supply the other feasible alternatives will have to be reconsidered.

5.2.2 Stage 2 - Creation of the Study Area Combinations

The Second Stage of our Approach Development Process involves identifying the Study Area options that can address Need in more than one WRZ within the Study Area, and then develop various combinations which contain elements of the different options. These are called SA Combinations. SA Combinations will consist of a number of different projects or options. Looking at a wider, more holistic, spatial scale benefits the Plan Level assessment in considering what options might work across multiple WRZs.

For each Study Area, one of the SA Combinations will always be the WRZ Level Approach. The WRZ Level Approach is the combination of all of the individual the Preferred Approach at WRZ level for the entire Study Area. Table 5.5 below provides a summary of the 96 Study Area options.

Table 5.5 SAI Grouped options

Water Resource Zone Name	Feasible Options SAI Cork		
	Option Code	Option Description	SA Grouped Option
Bandon Regional Cork City	SAI-801	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Bandon Regional and Inniscarra via Innishannon. Supply deficit from Inniscarra.	Group 1
Ballymakeera Macroom	SAI-803	Increase SW abstraction from Sullane River and new Macroom WTP for full demand. Rationalise Ballymakeera to Macroom WRZ.	Group 3
Macroom Clondrohid	SAI-805	Increase SW abstraction from Sullane River and new Macroom WTP for full demand. Rationalise Clondrohid to Macroom WRZ.	Group 5
Macroom Coolyhane	SAI-806	Increase SW abstraction from Sullane River and new Macroom WTP for full demand. Rationalise Coolyhane to Macroom WRZ.	Group 6
Macroom Ballyverane	SAI-807	Increase SW abstraction from Sullane River and new Macroom WTP for full demand. Rationalise Ballyverane to Macroom WRZ.	Group 7
Macroom Kilnagurteen Macroom	SAI-808	Increase SW abstraction from Sullane River and new Macroom WTP for full demand. Rationalise Kilnagurteen (Macroom) to Macroom WRZ.	Group 8
Aghabullogue Cork City	SAI-811	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Aghabullogue to Cork City WRZ.	Group 11
Ballinagree Rylane Cork City	SAI-818	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Rylane and Ballinagree to Cork City WRZ.	Group 18
Ballinagree Rylane	SAI-819	Upgrade Rylane WTP for water quality improvements. Currently not in deficit. Interconnect Ballinagree and Rylane and supply deficit from Rylane.	Group 19
Newcestown Mossgrove	SAI-820	Increase GW abstraction at Newcestown and rationalise Mossgrove to Newcestown WRZ for increased resilience.	Group 20
Nohoval Roberts Cove Minane Bridge Cork City	SAI-826	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Nohoval, Roberts Cove and Minane Bridge to Cork City WRZ.	Group 26
Clashanamid Cork City	SAI-827	Increase SW abstraction from Bandon River and upgrade Innishannon WTP. Rationalise Clashanamid to Cork City WRZ (Innishannon WTP).	Group 27
Knockburden Cork City	SAI-830	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Knockburden to Cork City WRZ via Cloughduv.	Group 30

Water Resource Zone Name	Feasible Options SAI Cork		
	Option Code	Option Description	SA Grouped Option
Templemartin & Garranes Cork City	SAI-831	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Templemartin & Garranes to Cork City WRZ.	Group 31
Aghabullogue Coolineagh Cork City	SAI-833	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Coolineagh and Aghabullogue to Cork City WRZ.	Group 33
Aghabullogue Coolineagh	SAI-834	New GW abstraction in the karstic region south of Aghabullogue WTP. Rationalise Coolineagh to Aghabullogue WRZ.	Group 34
Tibbotstown Cork City	SAI-836	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Tibbotstown with Cork City WRZ and supply deficit.	Group 36
Midleton Bilberry	SAI-838	Rationalise Bilberry WRZ to Midleton WRZ [spare capacity in Midleton].	Group 38
Midleton Corbally	SAI-839	Rationalise Corbally to Midleton WRZ [spare capacity in Midleton].	Group 39
Midleton Clash Leamleara	SAI-840	Rationalise Clash Leamleara to Midleton WRZ via Corbally [spare capacity in Midleton].	Group 40
Midleton Ballincurrig Lisgoold	SAI-841	Rationalise Ballincurrig Lisgoold WRZ to Midleton WRZ [spare capacity in Midleton].	Group 41
Midleton Walshtown	SAI-842	Rationalise Walshtown to Midleton WRZ [spare capacity in Midleton].	Group 42
Midleton Corbally Clash Leamleara Ballincurrig Lisgoold Walshtown Cork City	SAI-843	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Walshtown, Ballincurrig Lisgoold, Clash Leamleara and Corbally to Cork City. Maintain allowable abstraction from Owenacurra River in Midleton and supply deficit from Inniscarra.	Group 43
Midleton Cork City	SAI-844	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Midleton and Cork City WRZ and supply deficit.	Group 44
Youghal Regional Midleton Cork City	SAI-845	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Midleton and Youghal Regional with Cork City WRZ.	Group 45
Whitegate Regional Cloyne Midleton Cork City	SAI-846	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Midleton, Cloyne and Whitegate Regional with Cork City WRZ.	Group 46
Donoughmore Cork City	SAI-847	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Donoughmore WRZ to Cork City WRZ.	Group 47
Grenagh Cork City	SAI-848	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Grenagh WRZ to Cork City WRZ.	Group 48
Grenagh Stoneview Blarney Cork City	SAI-849	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Stoneview Blarney and Grenagh and Cork City WRZ.	Group 49
Stoneview Blarney Cork City	SAI-850	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Stoneview Blarney to Cork City WRZ.	Group 50
Killeagh Cork City	SAI-851	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Killeagh to Cork City WRZ.	Group 51

Water Resource Zone Name	Feasible Options SAI Cork		
	Option Code	Option Description	SA Grouped Option
Youghal Regional Ballykilty Knockadoon	SAI-854	New SW abstraction from Womanagh River and new WTP to partly supply deficit in Youghal. Rationalise Ballykilty and Knockadoon to Youghal WRZ.	Group 54
Whitegate Regional Killeagh	SAI-856	Increase GW abstraction from Dower Springs and new WTP for Whitegate Regional. Rationalise Killeagh to Whitegate Regional WRZ.	Group 56
Whitegate Regional Mogeely	SAI-859	Increase GW abstraction from Dower Springs and new WTP; New GW abstraction and new WTP for Whitegate Regional. Rationalise Mogeely to Whitegate Regional WRZ.	Group 59
Whitegate Regional Mogeely	SAI-860	Increase GW abstraction from Dower Springs and new WTP; New GW abstraction and new WTP for Whitegate Regional. Interconnect Mogeely with Whitegate Regional WRZ.	Group 60
Whitechurch Cork City	SAI-861	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Whitechurch WRZ to Cork City WRZ.	Group 61
Youghal Regional Ballymacoda	SAI-865	New SW abstraction from the River Blackwater and new WTP for Youghal Regional WRZ. Rationalise Ballymacoda to Youghal WRZ.	Group 65
Youghal Regional Ballykilty	SAI-866	New SW abstraction from the River Blackwater and new WTP for Youghal Regional WRZ. Rationalise Ballykilty to Youghal WRZ.	Group 66
Youghal Regional Knockadoon	SAI-867	New SW abstraction from the River Blackwater and new WTP for Youghal Regional WRZ. Rationalise Knockadoon to Youghal WRZ.	Group 67
Youghal Regional Ballymacoda Ballykilty Knockadoon	SAI-868	New SW abstraction from the River Blackwater and new WTP for Youghal Regional WRZ. Rationalise Ballymacoda, Ballykilty and Knockadoon to Youghal WRZ.	Group 68
Youghal Regional Ballymacoda Ballykilty Knockadoon Cork City Killeagh Mogeely Kilcraheen	SAI-869	Interconnect Youghal Regional and Mogeely with Cork City WRZ (Inniscarra WTP) via Midleton. Rationalise Ballymacoda, Ballykilty, Knockadoon, Killeagh and Kilcraheen to Cork City.	Group 69
Corbally Ballincurrig Lisgoold	SAI-870	Increase GW abstraction and supply deficit in Ballincurrig Lisgoold WRZ. Interconnect Corbally and Ballincurrig Lisgoold WRZs and supply deficit.	Group 70
Whitegate Regional Ballykilty Mogeely Killeagh	SAI-871	Increase GW abstraction from Dower Springs and new WTP; New GW abstraction and new WTP for Whitegate Regional. Rationalise Ballykilty, Mogeely and Killeagh to Whitegate Regional WRZ.	Group 71
Carrignavar Cork City	SAI-873	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Carrignavar to Cork City WRZ.	Group 73
Carrignavar Cork City	SAI-874	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Carrignavar and Cork City WRZs and supply deficit.	Group 74
Corbally Clash Leamleara	SAI-876	Increase GW abstraction to supply deficit in Corbally WRZ. Interconnect Clash Leamleara with Corbally WRZ and supply deficit.	Group 76
Mogeely Dungourney	SAI-877	Increase existing GW abstraction from infiltration gallery and supply deficit in Mogeely. Rationalise Dungourney to Mogeely WRZ.	Group 77

Water Resource Zone Name	Feasible Options SAI Cork		
	Option Code	Option Description	SA Grouped Option
Youghal Regional Kilcraheen	SAI-881	New SW abstraction from the River Blackwater and new WTP for Youghal Regional WRZ. Rationalise Kilcraheen to Youghal WRZ.	Group 81
Clonakilty Cork City Bayview	SAI-883	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Clonakilty and Cork City WRZ and supply deficit. Rationalise Bayview to Clonakilty WRZ.	Group 83
Bantry Cork City Bandon Regional Castletownbere Dunmanway Glengarriff Kealkill Adrigole Dromore Bantry Crostera Allihies Cahermore Reenmeen West Skibbereen 1 - Ballyhilty and Drimoleague Whiddy Island	SAI-885	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Bandon Regional, Bantry and Skibbereen 1 with Cork City. Rationalise Castletownbere, Dunmanway, Glengarriff, Kealkill, Whiddy Island, Adrigole, Dromore Bantry, Crostera, Allihies, Cahermore and Reenmeen West to Cork City WRZ.	Group 85
Glengarriff Reenmeen West	SAI-892	New SW abstraction from Glengarriff River and new WTP onsite. Rationalise Reenmeen to Glengarriff WRZ.	Group 92
Crostera Reenmeen West Glengarriff	SAI-893	Increase SW abstraction from Barley lake (Crostera WRZ). Interconnect Glengarriff with Crostera WRZ and supply deficit. Rationalise Reenmeen West to Crostera WRZ.	Group 93
Dunmanway Drinagh	SAI-897	Increase SW abstraction from Curraghlicky Lake and upgrade Drinagh WTP. Interconnect Dunmanway and Drinagh WRZs and supply deficit.	Group 97
Youghal Regional Inch	SAI-901	New SW abstraction from the River Blackwater and new WTP for Youghal Regional WRZ. Rationalise Inch to Youghal Regional WRZ.	Group 101
Tibbotstown Youghal Regional Whitegate Regional Midleton Cork City	SAI-912	Desalination plant to supply Cork City, Tibbotstown, Youghal Regional, Whitegate Regional and Midleton WRZs.	Group 112
Youghal Regional Ballymacoda	SAI-914	New SW abstraction from Womanagh River and new WTP to partly supply deficit in Youghal Regional WRZ. Rationalise Ballymacoda to Youghal WRZ.	Group 114
Clonakilty Cork City Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull Toormore	SAI-920	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Clonakilty, Skibbereen and Cork City WRZs and supply deficit. Rationalise Toormore to Skibbereen WRZ.	Group 120
Caherdaniel / Castlecove Waterville PWS 075H	SAI-923	Increase abstraction from Lough Currane and upgrade existing WTP to supply deficit in Waterville WRZ. Interconnect Caherdaniel/Castlecove and Waterville WRZs and supply deficit.	Group 123

Water Resource Zone Name	Feasible Options SAI Cork		
	Option Code	Option Description	SA Grouped Option
Bantry Skibbereen 1 - Ballyhilty and Drimoleague	SAI-924	New Inchybegga impoundment and new WTP for Bantry WRZ. Interconnect Skibbereen 1 - Ballyhilty and Drimoleague and Bantry WRZs and supply deficit.	Group 124
Croterra Adrigole Glengarriff Castletownbere	SAI-926	Increase SW abstraction from Barley lake (Croterra WRZ). Interconnect Adrigole, Glengarriff and Castletownbere with Croterra WRZ and supply deficit.	Group 126
Bantry Toormore Goleen Crookhaven Durrus	SAI-929	New SW abstraction from Mealagh River and supply deficit to Bantry WRZ. Rationalise Goleen, Toormore, Durrus and Crookhaven to Bantry WRZ.	Group 129
Clonakilty Skibbereen 1 - Ballyhilty and Drimoleague	SAI-935	New Desalination plant to supply Clonakilty and Skibbereen WRZs.	Group 135
Youghal Regional Killeagh Mogeely Ballykilty Cork City	SAI-937	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Youghal Regional with Cork City WRZ. Rationalise Killeagh, Mogeely and Ballykilty to Cork City WRZ.	Group 137
Bandon Regional Bantry Dunmanway Durrus Kilcrohane Dromore Bantry Cork City Skibbereen 1 - Ballyhilty and Drimoleague Whiddy Island	SAI-938	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Bandon Regional, Bantry and Skibbereen 1 with Cork City WRZ. Rationalise Whiddy Island, Durrus and Kilcrohane to Cork City WRZ.	Group 138
Tibbotstown Cork City	SAI-939	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Tibbotstown to Cork City WRZ.	Group 139
Tibbotstown Whitegate Regional Midleton Cloyne	SAI-940	New SW abstraction from the River Blackwater and new WTP. Rationalise Tibbotstown, Whitegate Regional, Midleton and Cloyne WRZs to the new WTP.	Group 140
Youghal Regional Ballymacoda Ballykilty Kilcraheen Knockadoon	SAI-941	Conjunctive use of new GW abstraction (karstic) and Womanagh River for Youghal WRZ. Rationalise Ballymacoda, Ballykilty, Kilcraheen and Knockadoon to Youghal Regional WRZ.	Group 141
Macroon Cork City	SAI-942	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Macroon and Cork City WRZs.	Group 142
Clonakilty Bayview	SAI-943	New SW abstraction from Corran lake and new SW abstraction from Ballin Lough to partly supply deficit in Clonakilty. New SW abstraction from Curraghlicky Lake and Ballynacarriga Lough and new WTP at Curraghlicky Lake to partly supply deficit. Rationalise Bayview to Clonakilty WRZ (new SW abstraction from surrounding lakes).	Group 143

Water Resource Zone Name	Feasible Options SAI Cork		
	Option Code	Option Description	SA Grouped Option
Cork City Ballinagree Rylane Tibbotstown Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull Bantry	SAI-945	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Ballinagree, Rylane, Tibbotstown, Skibbereen 1, Skibbereen 2 and Bantry to Cork City WRZ.	Group 145
Cork City Ballinagree Rylane Tibbotstown Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull Bantry Clonakilty Bayview	SAI-946	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Ballinagree, Rylane, Tibbotstown, Skibbereen 1, Skibbereen 2, Bantry, Clonakilty and Bayview to Cork City WRZ.	Group 146
Cork City Ballinagree Rylane Tibbotstown Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull Bantry Clonakilty Bayview Durrus Kilcrohane Castletownbere	SAI-947	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Ballinagree, Rylane, Tibbotstown, Skibbereen 1, Skibbereen 2, Bantry, Clonakilty, Bayview, Durrus, Kilcrohane and Castletownbere to Cork City WRZ.	Group 147
Cork City Ballinagree Rylane Tibbotstown Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull Bantry Clonakilty Bayview Durrus Kilcrohane Castletownbere	SAI-948	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Ballinagree, Rylane, Tibbotstown, Skibbereen 1, Skibbereen 2, Bantry, Clonakilty, Bayview, Durrus, Kilcrohane, Castletownbere, Glengarriff, Reenmeen West and Adrigole to Cork City WRZ.	Group 148

Water Resource Zone Name	Feasible Options SAI Cork		
	Option Code	Option Description	SA Grouped Option
Glengarriff Reenmeen West Adrigole			
Youghal Regional Knockadoon Ballymacoda Kilcraheen	SAI-949	New GW abstraction and new WTP to supply deficit in Youghal Regional WRZ. Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal Regional WRZ.	Group 149
Ballykilty Killeagh	SAI-950	Increase GW abstraction and supply deficit in Killeagh WRZ. Rationalise Ballykilty to Killeagh WRZ.	Group 150
Youghal Regional Knockadoon Ballymacoda Kilcraheen Ballykilty	SAI-951	New GW abstraction and new WTP to supply deficit in Youghal Regional WRZ. Rationalise Knockadoon, Ballymacoda and Kilcraheen and Ballykilty to Youghal Regional WRZ.	Group 151
Macroom Kilnagurteen Macroom Ballyverane Coolyhane Clondrohid	SAI-952	Increase SW abstraction from Sullane River and new WTP Macroom WTP for full demand. Rationalise Kilnagurteen (Macroom), Ballyverane, Coolyhane and Clondrohid to Macroom WRZ.	Group 152
Cullen Cork City	SAI-953	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Cullen to Cork City WRZ.	Group 153
Cork City Ballyshoneen Vicarstown	SAI-954	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Ballyshoneen and Vicarstown to Cork City WRZ.	Group 154
Bantry Glengarriff Adrigole Reenmeen West Castletownbere	SAI-955	New Inchybegga impoundment and new WTP to supply deficit in Bantry. Rationalise Glengarriff, Adrigole, Reenmeen West, Castletownbere to Bantry WRZ.	Group 155
Cork City Bayview Clonakilty Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull Bantry Glengarriff Reenmeen West Adrigole Castletownbere	SAI-956	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Interconnect Clonakilty and Skibbereen with Cork City WRZ. Rationalise Bayview, Bantry, Glengarriff, Reenmeen West, Adrigole and Castletownbere to Cork City WRZ.	Group 156
Glengarriff Reenmeen West	SAI-957	New SW abstraction and new WTP on the Glengarriff River and abandon existing WTP on Barony River. Rationalise Reenmeen West to Glengarriff WRZ.	Group 157
Lauragh PWS Castletownbere	SAI-958	New SW abstraction from Glenmore Lake and new WTP to supply Lauragh and Castletownbere WRZs.	Group 158
Bantry Kealkill	SAI-959	New SW abstraction from Owvane River and new WTP to supply deficit in Bantry. Rationalise Kealkill to Bantry WRZ.	Group 159
Cluain Court Allihies Allihies	SAI-960	Rationalise Allihies to Ballydonegan GWS. Rationalise Cluain Court Allihies to Allihies.	Group 160

Water Resource Zone Name	Feasible Options SAI Cork		
	Option Code	Option Description	SA Grouped Option
Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull	SAI-962	Upgrade Ballyhilty WTP and supply spare capacity to Skibbereen 2 - Baltimore and Schull WRZ. Upgrade Lake Cross WTP for water quality improvements.	Group 162
Nohoval Minane Bridge Roberts Cove	SAI-963	New GW abstraction and upgrade Minane Bridge WTP. Interconnect Nohoval and Minane Bridge WRZs and supply deficit from Minane WRZ.	Group 163
Aghabullogue Ballinagree Rylane Coolineagh Cork City	SAI-964	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Aghabullogue, Ballinagree, Rylane and Coolineagh to Cork City WRZ.	Group 164
Cork City Bayview Bandon Regional Clonakilty	SAI-965	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Bayview to Cork City WRZ. Interconnect Bandon Regional and Clonakilty with Cork City WRZ.	Group 165
Cork City Bayview Bandon Regional Clonakilty Lyre Clonakilty	SAI-966	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Bayview and Lyre Clonakilty to Cork City WRZ. Interconnect Bandon Regional and Clonakilty with Cork City WRZ.	Group 166
Cork City Bayview Bandon Regional Clonakilty Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull	SAI-967	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Bayview to Cork City. Interconnect Bandon Regional, Clonakilty, Skibbereen 1 - Ballyhilty and Drimoleague and Skibbereen 2 - Baltimore and Schull with Cork City WRZ.	Group 167
Cork City Bayview Bandon Regional Clonakilty Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull Toormore	SAI-968	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Bayview and Toormore to Cork City. Interconnect Bandon Regional, Clonakilty, Skibbereen 1 - Ballyhilty and Drimoleague and Skibbereen 2 - Baltimore and Schull with Cork City WRZ.	Group 168
Cork City Bayview Bandon Regional Clonakilty Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull Toormore Durrus	SAI-969	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Bayview, Toormore and Durrus to Cork City WRZ. Interconnect Bandon Regional, Clonakilty, Skibbereen 1 - Ballyhilty and Drimoleague and Skibbereen 2 - Baltimore and Schull with Cork City WRZ.	Group 169

Water Resource Zone Name	Feasible Options SAI Cork		
	Option Code	Option Description	SA Grouped Option
Cork City Bayview Bandon Regional Clonakilty Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull Toormore Castletownbere Adrigole Glengarriff Reenmeen West Bantry Kealkill	SAI-970	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Bayview, Toormore, Kealkill, Castletownbere, Adrigole, Glengarriff, Reenmeen West and Bantry to Cork City WRZ. Interconnect Bandon Regional, Clonakilty, Skibbereen 1 - Ballyhilty and Drimoleague and Skibbereen 2 - Baltimore and Schull with Cork City WRZ.	Group 170
Cork City Knockburden Templemartin & Garranes Aghabullogue Coolineagh Corbally Clash Leamleara Ballincurrig Lisgoold Walshtown Midleton Grenagh Stoneview Blarney Cullen Ballyshoneen Vicarstown Ballinagree Rylane Bayview Bandon Regional Clonakilty Tibbotstown Clashanamid	SAI-971	Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Knockburden, Templemartin & Garranes, Corbally, Ballincurrig Lisgoold, Walshtown, Stoneview Blarney, Cullen, Ballyshoneen, Tibbotstown and Vicarstown, Aghabullogue, Coolineagh, Ballinagree, Rylane, Bayview, Clash Leamleara, Grenagh and Clashanamid to Cork City WRZ. Interconnect Bandon Regional, Clonakilty and Midleton with Cork City WRZ and supply deficit.	Group 171
Bayview Bandon Regional Clonakilty	SAI-972	Interconnect Bandon Regional and Clonakilty with Cork City via Inniscarra. Rationalise Bayview to Cork City.	Group 172

The 96 SA grouped options results in six (6) SA Combinations that could meet the need across all WRZs. The WRZ Level Approach is excluded at this stage of comparison as 4 WRZs do not have a WRZ Level Approach. The six (6) SA Combinations in terms of the types of options within each combination are summarised in Table 5.6 below.

Table 5.6 SAI Combinations

Key	WRZ Approach Option	<input type="checkbox"/>	SA Grouped Option	<input type="checkbox"/>
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WRZ	WRZ Approach	SA Combination 1 (SA Grouped Option 123, 170a)	SA Combination 2 (SA Grouped Option 56, 123, 139, 162, 172)	SA Combination 3 (SA Grouped Option 50, 56, 123, 162, 172)	SA Combination 4 (SA Grouped Option 56, 126, 129, 139, 162, 172)	SA Combination 5 (SA Grouped Option 50, 56, 123, 129, 162, 172)	SA Combination 6 (SA Grouped Option 20, 77, 97, 123, 149, 150, 152, 155, 160, 162, 163, 171)
Adrigole	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aghabullogue	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Allihies	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ard Na Killy Ridge	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ballinagree	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ballincurrig Lisgoold	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ballingeary	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ballykilty	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ballymacoda	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ballymakeera	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ballyshoneen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ballyverane	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bandon Regional	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

WRZ	WRZ Approach	SA Combination 1 (SA Grouped Option 123, 170a)	SA Combination 2 (SA Grouped Option 56, 123, 139, 162, 172)	SA Combination 3 (SA Grouped Option 50, 56, 123, 162, 172)	SA Combination 4 (SA Grouped Option 56, 126, 129, 139, 162, 172)	SA Combination 5 (SA Grouped Option 50, 56, 123, 129, 162, 172)	SA Combination 6 (SA Grouped Option 20, 77, 97, 123, 149, 150, 152, 155, 160, 162, 163, 171)
Bantry	○	□	○	○	□	□	□
Bayview	No local solution	□	□	□	□	□	□
Bilberry	○	○	○	○	○	○	○
Caheragh	○	○	○	○	○	○	○
Caherdaniel / Castlecove	No local solution	□	□	□	□	□	□
Cahermore	○	○	○	○	○	○	○
Cape Clear	○	○	○	○	○	○	○
Carrignadoura	○	○	○	○	○	○	○
Carrignavar	○	○	○	○	○	○	○
Castletownbere	○	□	○	○	○	○	□
Clash_Leamleara	○	○	○	○	○	○	□
Clashanamid	○	○	○	○	○	○	□
Clonakilty	No local solution	□	□	□	□	□	□
Clondrohid	○	○	○	○	○	○	□
Cloyne	○	○	○	○	○	○	○
Cluain Court Allihies	○	□	○	○	○	○	□

WRZ	WRZ Approach	SA Combination 1 (SA Grouped Option 123, 170a)	SA Combination 2 (SA Grouped Option 56, 123, 139, 162, 172)	SA Combination 3 (SA Grouped Option 50, 56, 123, 162, 172)	SA Combination 4 (SA Grouped Option 56, 126, 129, 139, 162, 172)	SA Combination 5 (SA Grouped Option 50, 56, 123, 129, 162, 172)	SA Combination 6 (SA Grouped Option 20, 77, 97, 123, 149, 150, 152, 155, 160, 162, 163, 171)
Coolineagh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Coolyhane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Coppeen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Corbally	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Cork City	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Crookhaven	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>
Croterra	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Cullen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Donoughmore	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Drinagh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Dromore Bantry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Dungourney	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Dunmanway	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Durrus	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>
Dursey Island	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Glengarriff	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Goleen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>

WRZ	WRZ Approach	SA Combination 1 (SA Grouped Option 123, 170a)	SA Combination 2 (SA Grouped Option 56, 123, 139, 162, 172)	SA Combination 3 (SA Grouped Option 50, 56, 123, 162, 172)	SA Combination 4 (SA Grouped Option 56, 126, 129, 139, 162, 172)	SA Combination 5 (SA Grouped Option 50, 56, 123, 129, 162, 172)	SA Combination 6 (SA Grouped Option 20, 77, 97, 123, 149, 150, 152, 155, 160, 162, 163, 171)
Grenagh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Inch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Inchigeelagh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Johnstown	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kealkill	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kenmare / Kilgarvan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kilcraheen	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Kilcrohane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Kilgarvan	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Killeagh	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kilnagurteen Macroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Kilnamartyra	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knockadoon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Knockanleigh	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Knockburden	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Lauragh PWS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Lyre Clonakilty	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

WRZ	WRZ Approach	SA Combination 1 (SA Grouped Option 123, 170a)	SA Combination 2 (SA Grouped Option 56, 123, 139, 162, 172)	SA Combination 3 (SA Grouped Option 50, 56, 123, 162, 172)	SA Combination 4 (SA Grouped Option 56, 126, 129, 139, 162, 172)	SA Combination 5 (SA Grouped Option 50, 56, 123, 129, 162, 172)	SA Combination 6 (SA Grouped Option 20, 77, 97, 123, 149, 150, 152, 155, 160, 162, 163, 171)
Macroom	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Midleton	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Minane Bridge	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Mogeely	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Mossgrove	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Newcestown	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Nohoval	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Ratharoon	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Reenmeen West	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Roberts Cove	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Rylane	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Skibbereen 2 - Baltimore and Schull	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Skibbereen 1 - Ballyhilty and Drimoleague	No local solution	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sneam PWS	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Stoneview Blarney	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>
Tarelton	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

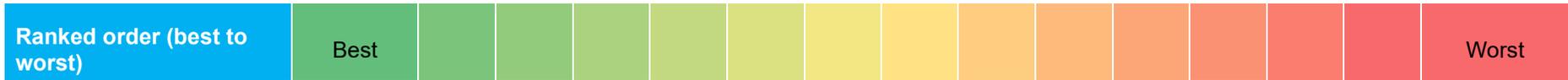
WRZ	WRZ Approach	SA Combination 1 (SA Grouped Option 123, 170a)	SA Combination 2 (SA Grouped Option 56, 123, 139, 162, 172)	SA Combination 3 (SA Grouped Option 50, 56, 123, 162, 172)	SA Combination 4 (SA Grouped Option 56, 126, 129, 139, 162, 172)	SA Combination 5 (SA Grouped Option 50, 56, 123, 129, 162, 172)	SA Combination 6 (SA Grouped Option 20, 77, 97, 123, 149, 150, 152, 155, 160, 162, 163, 171)
Templemartin & Garranes	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Tibbotstown	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="checkbox"/>
Toormore	<input type="radio"/>	<input type="checkbox"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>
Vicarstown	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Walshtown	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>
Waterville PWS 075H	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Whiddy Island	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whitechurch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Whitegate Regional	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="radio"/>
Youghal Regional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>

5.2.3 Stage 3 – Preferred Approach at Study Area Level

As part of stage three, we compare the WRZ Level Approach and the SA Combinations to determine the Preferred Approach that provides the best outcome for the Study Area. As the WRZ Level Preferred Approach did not meet the deficit for the Study Area as a whole, it has not been assessed and assigned a score for the purposes of determining the best performing alternative within each approach category.

We use the EBSD tool to rank the combinations against the assessment criteria and we then compare the best performing SA Combinations under each of the six approach types, using the 7 step process set out in Fig 5.1, to establish the Preferred Approach at Study Area level. The results of this process are provided in Table 5.7

Table 5.7 SA1 Summary of SA Combination of Performance against Approach Type



WRZ	WRZ Level Approach (Did not meet need)	SA Combination 1 (SA Grouped Option 123, 170a)	SA Combination 2 (SA Grouped Option 56, 123, 139, 162, 172)	SA Combination 3 (SA Grouped Option 50, 56, 123, 162, 172)	SA Combination 4 (SA Grouped Option 56, 126, 129, 139, 162, 172)	SA Combination 5 (SA Grouped Option 50, 56, 123, 129, 162, 172)	SA Combination 6 (SA Grouped Option 20, 77, 97, 123, 149, 150, 152, 155, 160, 162, 163, 171)
Least Cost						Worst	Best
Quickest Delivery		Best					
Best AA *no. of -3 scores against biodiversity	4 No -3 Scores	3 No -3 Scores	3 No -3 Scores	4 No -3 Scores	3 No -3 Scores	4 No -3 Scores	1 No -3 Score
Lowest Carbon		Worst					
Most Resilient		Worst					Best
Best Environmental			Worst				Best

The SA Combinations in Table 5.6 are assessed to determine the approach categories as summarised in Table 5.8

Table 5.8 Best Combinations

Approach Categories	Best Performing Combination
Least Cost (LCo)	Combination 6
Best Environmental (BE)	Combination 6
Quickest Delivery (QD)	Combination 1
Most Resilient (MR)	Combination 6
Lowest Carbon (LC)	Combination 2
Best AA (BA)	Combination 6

The MCA assessment included the following assessment criteria:

- Resilience;
- Deliverability and Flexibility;
- Progressibility; and
- Sustainability (Environmental and Social Impacts).

The NPV Costs are based on four criteria:

- Capital Costs – the cost to construct the option, including all overheads, consent and land acquisition costs;
- Operational Costs – the whole life cost to operate the option, including operators, chemical requirements and energy requirements including pumping;
- Carbon Costs – the whole life embodied and operational Carbon costs of the option; and
- Environmental and Social – the whole life Environmental and Social cost of the option covering climate regulation, traffic disruption and food production (carbon emissions are covered separately in the bullet point above).

The wider range of costs used in the estimation of the NPV aligns our Plan with any future Project Level Cost Benefit Analysis, in accordance with the Public Spending Code.

In terms of NPV Cost, Combination 6 has the lowest NPV Cost, as shown in Figure 5.3 with the lowest total costs (CAPEX and OPEX) over the solutions lifetime.

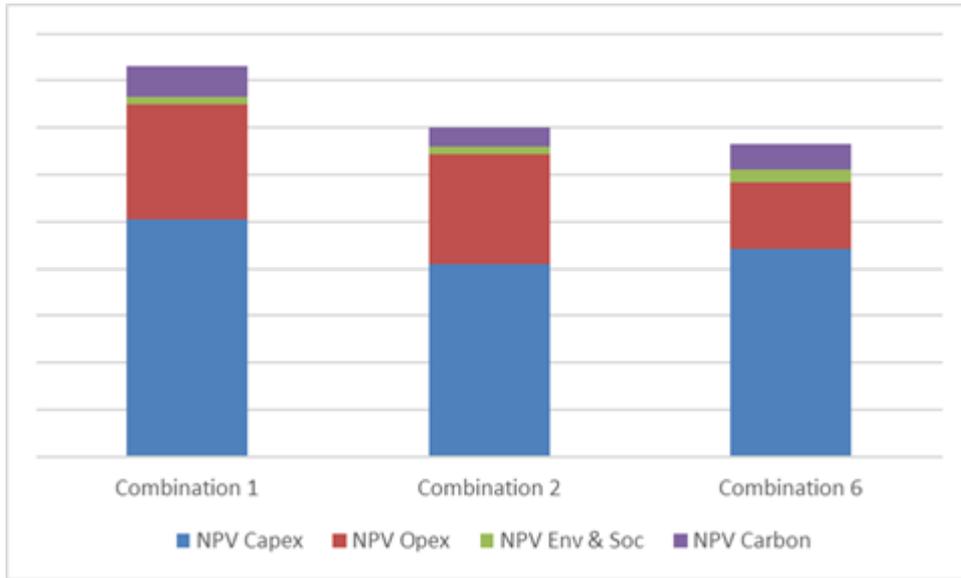


Figure 5.2 SAI NPV Costs for WRZ and SA approaches

In accordance with the Options Methodology. These approaches are then compared against each other using the 7-Step process in Figure 5.1 to generate the best value combination of options at the Study Area level. The best value combination of options at the Study Area level results in the SA Preferred Approach. The outputs from the assessment were as follows:

- Step 1 – We compared the Least Cost Approach against the Best AA approach. The Least Cost approach and the Best AA Approach are the same Approach. The Least Cost approach was therefore retained at this stage.
- Step 2 – We compared the Quickest Delivery Approach against the Least Cost Approach. The Quickest Delivery approach does not deliver significantly better scores against the quickest delivery criteria compared to the Least Cost and the Quickest Delivery Approach performs poorly against the Environmental, Carbon and Resilience criteria when compared to the Least Cost Approach and contains 3 options with a -3 biodiversity score. The Least Cost approach was therefore retained at this stage.
- Step 3 - We compared the Least Cost against the Best Environmental Approach. The Least Cost approach and the Best Environmental Approach are the same Approach. The Least Cost approach was therefore retained at this stage.
- Step 4 – We compared the Least Cost against the Most Resilient Approach. The Least Cost approach and the Most Resilient Approach are the same Approach. The Least Cost approach was therefore retained at this stage.
- Step 5 - We compared the Least Cost Approach against the Least Carbon Approach. The Least Carbon Approach has lower carbon costs compared to the Least Cost Approach, however, carbon costs for both approaches are low when compared the total NPV costs. The Least Carbon Approach performs poorly against the Environmental and Resilience criteria when compared to the Least Cost Approach and contains 3 options with a -3 biodiversity score. The Least Cost approach was therefore retained at this stage.
- Step 6 – A final assessment of the Least Cost was completed against the Least Carbon, Best AA, Best Environmental, Quickest Delivery and Most Resilient Approaches. The Least Costs Approach is the Best AA, Best Environmental and Most Resilient Approach. While the

Least Cost Approach has higher carbon costs compared to the Least Carbon Approach, carbon costs are low when compared the total NPV costs. The Least Cost approach was therefore retained at this stage.

- Step 7 – The Least Cost Approach was therefore selected as the Preferred Approach for the Water Resource and Study Area Levels.

5.3 Study Area Preferred Approach Summary

On the basis of this initial assessment at Plan Level, Combination 6 represents the Preferred Approach for Study Area I, which consists of the options listed in Table 5.9.

Table 5.9 Preferred Approach for SAI

WRZ Name	Preferred Approach Option Description SA Combination 6 - Group 820, 877, 897, 923, 949, 950, 952, 955, 960, 962, 963 & 971
Aghabullogue Bandon Regional Ballinagree Ballincurrig Lisgoold Ballyshoneen Bayview Clash Leamleara Clashanamid Clonakilty Coolineagh Corbally Cork City Cullen Grenagh Knockburden Midleton Rylane Stoneview Blarney Templemartin & Garranes Tibbotstown Vicarstown Walshtown	Group 971 Increase abstraction at Inniscarra impoundment and upgrade Inniscarra WTP. Rationalise Knockburden, Templemartin & Garranes, Corbally, Ballincurrig Lisgoold, Walshtown, Stoneview Blarney, Cullen, Ballyshoneen, Tibbotstown and Vicarstown, Aghabullogue, Coolineagh, Ballinagree, Rylane, Bayview, Clash Leamleara, Grenagh and Clashanamid to Cork City WRZ. Interconnect Bandon Regional, Clonakilty and Midleton with Cork City WRZ and supply deficit.
Adrigole Bantry Castletownbere Glengarriff Reenmeen West	Group 955 New Inchybegga impoundment and new WTP to supply deficit in Bantry. Rationalise Glengarriff, Adrigole, Reenmeen West, Castletownbere to Bantry WRZ.
Allihies Cluain Court Allihies	Group 960 Rationalise Allihies to Ballydonegan GWS. Rationalise Cluain Court Allihies to Allihies.
Ard Na Killy Ridge	SAI-050 Increase GW abstraction and upgrade Ard Na Killy WTP to supply deficit.
Ballingeary	SAI-060 Increase SW from Bunsheelin River and upgrade WTP to supply deficit.
Ballykilty Killeagh	Group 950 Increase GW abstraction and supply deficit in Killeagh WRZ. Rationalise Ballykilty to Killeagh WRZ.
Ballymacoda Kilcraheen Knockadoon Youghal Regional	Group 949 New GW abstraction and new WTP to supply deficit in Youghal Regional WRZ. Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal Regional WRZ.

WRZ Name	Preferred Approach Option Description SA Combination 6 - Group 820, 877, 897, 923, 949, 950, 952, 955, 960, 962, 963 & 971
Ballymakeera	SAI-011 New SW abstraction from River Sullane and upgrade Ballymakeera WTP to supply deficit.
Ballyverane Clondrohid Coolyhane Kilnagurteen Macroom Macroom	Group 952 Increase SW abstraction from Sullane River and new WTP Macroom WTP for full demand. Rationalise Kilnagurteen (Macroom), Ballyverane, Coolyhane and Clondrohid to Macroom WRZ.
Bilberry	SAI-781 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Caheragh	SAI-772 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Caherdaniel / Castlecove Waterville PWS 075H	Group 923 Increase abstraction from Lough Currane and upgrade existing WTP to supply deficit in Waterville WRZ. Interconnect Caherdaniel/Castlecove and Waterville WRZs and supply deficit.
Cahermore	SAI-480 New GW abstraction and upgrade WTP to supply deficit. Abandon existing SW source.
Cape Clear	SAI-780 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Carrignadoura	SAI-102 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Carrignavar	SAI-273 Increase existing GW abstraction and upgrade WTP to supply deficit.
Cloyne	SAI-193 New GW abstraction and new WTP to supply deficit.
Coppeen	SAI-486 Increase GW abstraction and upgrade Coppeen WTP to supply deficit.
Crookhaven	SAI-784 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Croterra	SAI-468 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Donoughmore	SAI-212 New GW abstraction and upgrade WTP to supply deficit.
Drinagh Dunmanway	Group 897 Increase SW abstraction from Curraghlicky Lake and upgrade Drinagh WTP. Interconnect Dunmanway and Drinagh WRZs and supply deficit.
Dromore Bantry	SAI-455 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Dungourney Mogeely	Group 877 Increase existing GW abstraction from infiltration gallery and supply deficit in Mogeely. Rationalise Dungourney to Mogeely WRZ.

WRZ Name	Preferred Approach Option Description SA Combination 6 - Group 820, 877, 897, 923, 949, 950, 952, 955, 960, 962, 963 & 971
Durrus	SAI-442 Increase GW abstraction and upgrade WTP to supply deficit.
Durse Island	SAI-768 New raw water storage for this WRZ. Based on requiring 100 days' supply of 13m ³ /d deficit.
Goleen	SAI-457 Increase SW abstraction from Goleen Intake and upgrade Goleen WTP to supply deficit.
Inch	SAI-324 Increase existing GW abstraction from spring and upgrade WTP to supply deficit.
Inchigeelagh	SAI-771 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Johnstown	SAI-526 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Kealkill	SAI-410 New SW abstraction from Coomhola River and new WTP to supply deficit.
Kenmare / Kilgarvan	SAI-630 New SW abstraction from Kenmare River and new WTP to supply deficit.
Kilcrohane	SAI-660 New GW abstraction and new WTP to supply full demand. Abandon existing GW source.
Kilgarvan	SAI-645 New GW abstraction and upgrade existing WTP to supply deficit.
Kilnamartyra	SAI-774 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Knockanleigh	SAI-146 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Lauragh PWS	SAI-652 New SW abstraction from Glenmore Lake and upgrade existing WTP to supply deficit.
Lyre Clonakilty	SAI-779 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Minane Bridge Nohoval Roberts Cove	Group 963 New GW abstraction and upgrade Minane Bridge WTP. Interconnect Nohoval and Minane Bridge WRZs and supply deficit from Minane Bridge WRZ.
Mossgrove Newcestown	Group 820 Increase GW abstraction at Newcestown and rationalise Mossgrove to Newcestown WRZ for increased resilience.
Ratharoon	SAI-778 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.

WRZ Name	Preferred Approach Option Description SA Combination 6 - Group 820, 877, 897, 923, 949, 950, 952, 955, 960, 962, 963 & 971
Skibbereen 1 - Ballyhilty and Drimoleague Skibbereen 2 - Baltimore and Schull	Group 962 Upgrade Ballyhilty WTP and supply spare capacity to Skibbereen 2 - Baltimore and Schull WRZ. Upgrade Lake Cross WTP for water quality improvements.
Sneem PWS	SAI-643 Increase SW abstraction from Lough Dromtine and upgrade WTP to supply deficit.
Tarelton	SAI-508 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit.
Toormore	SAI-498 New GW abstraction and upgrade Toormore WTP to supply deficit.
Whiddy Island	SAI-450 New GW abstraction on the island and new WTP to supply deficit.
Whitechurch	SAI-239 & SAI-240 Increase GW abstraction to supply deficit. New GW abstraction in Whitechurch to supply deficit.
Whitegate Regional	SAI-176 Increase GW abstraction from Dower Springs and new WTP supply full demand.

The Preferred Approach (Combination 6) is shown schematically in Figure 5.3.

Note The WRZ Preferred Approach for Whiddy Island is to develop a new groundwater abstraction on the island to supply the required deficit. Three sites on the Island are considered potentially good locations for ground water supply and a trail well was developed on one of these sites. Results from the trail well test indicate that arsenic is evident in the groundwater and it would not be a suitable source of raw water for public water supply purposes. Trial tests will be carried out at the other two sites and if it is determined, further to these site investigations, that the groundwater supply is not suitable for public water supply the other feasible alternatives will have to be reconsidered.

The Preferred Approach for SAI Cork 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)

- 2,294 m³ of nett leakage reduction across 2 WRZs (applied to SDB deficit);
- The option to implement legally enforceable Water Conservation Orders in drought periods in order to protect the environment and our public water supplies.

Before we adopt this approach at Plan Level for SAI, we must consider the following:

- **Interim Solutions:** Based on the scale of need identified across the entire country it is likely that it may take 5-10 investment cycles before we address all issues with the existing water supplies. Therefore, small localised options may be required on an interim basis to secure priority need in existing supplies until the SA Preferred Approach can be delivered; and,
- **Sensitivity Analysis:** When planning for water supplies over a medium to long term horizon, we must give consideration to adaptability of our plan to change across a range of futures (for example, what if population growth rates are lower than expected or what if we are unable to secure a licence in the medium term to abstract the quantity water currently allowed for at a given location).



6

Preferred Plan Constraints – Interim Solutions

6 Interim Solutions

As outlined in more detail in Section 8.3.7.6 of the Framework Plan, the NWRP provides for an “interim solution” approach, which allows shorter term interventions to be identified and prioritised, when

needed. The Preferred Approach for each WRZ, Study Area and Region will be delivered on a phased basis subject to budget and regulatory constraints. It will take many investment cycles to deliver the Preferred Approach across all WRZs, therefore, Irish Water must have a means to continue delivering safe, secure and reliable water supplies (on a short to medium term basis) while we deliver our Preferred Approach.

On this basis, interim, short term capital maintenance solutions have been identified for all WTPs and will be utilised when needed. These solutions will allow IRISH WATER time to deliver the Preferred Approach, while at the same time, maintaining a sustainable water supply. These interim solutions are generally smaller in scale and rely on making best use of already existing infrastructure.

Examples of general interim measures for different water sources include the following:

- For groundwater sites, where the Preferred Approach requires that the existing WTP is to be maintained, the interim solution would typically provide for refurbishment of the existing or development of new boreholes and borehole pumps, and an upgrade of the treatment process in line with proposed growth predictions. This may require a staged upgrade of the WTP. For example, the interim solution would typically include an upgrade of the WTP to provide supply to existing customers with consideration given to a further required expansion of the WTP at a later date.
- For surface water sites, where the Preferred Approach requires that the existing WTP is to be maintained, the interim option would typically involve the upgrade of the existing WTP in line with proposed growth predictions. As for groundwater sites this may require a staged upgrade of the WTP where the interim solution would typically include an upgrade of the WTP to provide supply to existing customers with consideration given to a further required expansion of the WTP at a later date.
- For groundwater and surface water sites where the Preferred Approach involves the decommissioning of the WTP by providing supply to the customers from another WTP within the WRZ or from another WRZ/Study Area/Region, the interim solution would involve the advancement of the rationalisation of the WTP, by provision of part supply or full supply if possible. If rationalisation is not feasible at that point in time due to dependencies on Study Area or Regional options, containerised WTP upgrade solutions would be considered for the WTP. This involves the provision of a package WTP within a containerised unit. These package plants can be modified for use on other sites in the future therefore are considered “no regrets” infrastructure investment

A decision to progress any interim solution will be based on priority need to address water quality risk or supply reliability e.g. RAL, drought issues or critical need for example. The Regional Plan does not confer funding availability for any project and any interim measures will be subject to budget availability, relevant environmental assessment and other required consents in the normal way.

These solutions, in most cases, will only be used to allow time to deliver the longer-term solution. The interim solutions are determined in line with the Preferred Approach and as such, they are considered “no regrets” infrastructure investment.

Table 6.1 SAI Interim Options

WTP Name	Interim Option
Watergrasshill WTP	Refurb existing Springs, and upgrade WTP to IRISH WATER Standards
Carhue WTP	Upgrade WTP to IRISH WATER Standards

WTP Name	Interim Option
Clashanamid WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Newcestown WTP	Refurb existing Borehole, and upgrade WTP to IRISH WATER Standards
Mossgrove WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Knockraha WTP	Upgrade WTP to IRISH WATER Standards
Ratharoon WTP	Upgrade WTP to IRISH WATER Standards
Bayview WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Ard Na Killy Ridge WTP	Refurb existing Boreholes, and upgrade WTP to IRISH WATER Standards
Cullen WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Nohoval WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Roberts Cove WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Minane Bridge WTP	Refurb existing Spring, and upgrade WTP to IRISH WATER Standards
Ballinagree WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Ballingeary WTP	Upgrade WTP to IRISH WATER Standards
Ballymakeera WTP	Upgrade WTP to IRISH WATER Standards
Clondrohid WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Inchigeelagh WTP	Upgrade WTP to IRISH WATER Standards
Kilnamartyra WTP	Upgrade WTP to IRISH WATER Standards
Macroom WTP	Upgrade WTP to IRISH WATER Standards
Coolyhane WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Kilnagorteen WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Ballyverane WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Carrignadoura WTP	Upgrade WTP to IRISH WATER Standards
Bilberry WTP	Upgrade WTP to IRISH WATER Standards
Clash WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Carriglusky WTP	Refurb existing Boreholes, and upgrade WTP to IRISH WATER Standards
Ballincurrig WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Midleton WTP	Upgrade WTP to IRISH WATER Standards
Kilva WTP	Refurb existing Spring, and upgrade WTP to IRISH WATER Standards

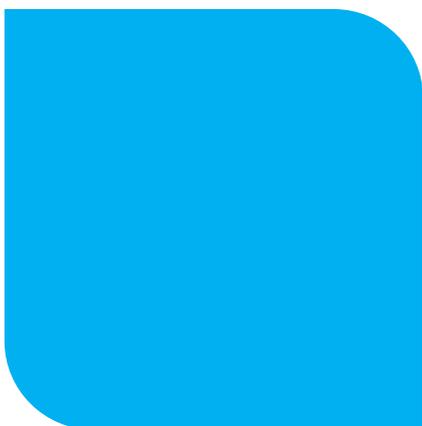
WTP Name	Interim Option
Tibbotstown WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Corbally WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Ballymacoda WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Dungourney WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Inch Cross WTP	Refurb existing Borehole, and upgrade WTP to IRISH WATER Standards
Ballymacoda Road WTP	Refurb existing Borehole, and upgrade WTP to IRISH WATER Standards
Killeagh (Youghal Rd) WTP	Refurb existing Borehole, and upgrade WTP to IRISH WATER Standards
Kilcraheen WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Knockadoon WTP 1	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Knockadoon WTP 2	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Mogeely WTP	Upgrade WTP to IRISH WATER Standards
Walshtown Beg WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Glendine WTP	Upgrade WTP to IRISH WATER Standards
Ballykilty WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Knockburden WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Templemartin WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Garranes WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Knockanleigh WTP	Upgrade WTP to IRISH WATER Standards
Aghabullogue WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Donoughmore WTP	Refurb existing Boreholes, and upgrade WTP to IRISH WATER Standards
Grenagh WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Rylane (Creamery) WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Rylane (Cross) WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Stoneview WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Vicarstown WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution

WTP Name	Interim Option
Ballyshoneen WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Coolineagh WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Carrignavar WTP	Refurb existing Boreholes, and upgrade WTP to IRISH WATER Standards
Glashaboy WTP	Upgrade WTP to IRISH WATER Standards
Whitechurch WTP	Refurb existing Boreholes, and upgrade WTP to IRISH WATER Standards
Inniscarra WTP	Upgrade WTP to IRISH WATER Standards
Innishannon WTP	Upgrade WTP to IRISH WATER Standards
Derryginagh WTP	Upgrade WTP to IRISH WATER Standards
Durrus WTP	Refurb existing Boreholes, and upgrade WTP to IRISH WATER Standards
Kealkill WTP	Upgrade WTP to IRISH WATER Standards
Kilcrohane WTP	Refurb existing Boreholes, and upgrade WTP to IRISH WATER Standards
Whiddy Island WTP	Refurb existing Borehole, and upgrade WTP to IRISH WATER Standards
Dromore WTP	Upgrade WTP to IRISH WATER Standards
Crosterra WTP	Upgrade WTP to IRISH WATER Standards
Cahernacrin WTP	Upgrade WTP to IRISH WATER Standards
Adrigole WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Allihies WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Ballydonegan WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Cahermore WTP	Upgrade WTP to IRISH WATER Standards
Castletownbere WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Dursey Island WTP	Refurb existing Spring, and upgrade WTP to IRISH WATER Standards
Glengarriff WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Clonakilty (Jones Bridge) WTP	Upgrade WTP to IRISH WATER Standards
Lyre (Clonakilty) WTP	Upgrade WTP to IRISH WATER Standards
Coppeen WTP	Refurb existing Borehole, and upgrade WTP to IRISH WATER Standards
Dunmanway WTP	Upgrade WTP to IRISH WATER Standards
Tarelton WTP	Upgrade WTP to IRISH WATER Standards
Johnstown WTP	Upgrade WTP to IRISH WATER Standards
Cluain Court (Allihies) WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Crookhaven WTP	Upgrade WTP to IRISH WATER Standards
Goleen WTP	Upgrade WTP to IRISH WATER Standards

WTP Name	Interim Option
Toormore WTP	Refurb existing Borehole, and upgrade WTP to IRISH WATER Standards
Baltimore (Lake Cross) WTP	Upgrade WTP to IRISH WATER Standards
Cape Clear WTP	Upgrade WTP to IRISH WATER Standards
Drinagh WTP	Upgrade WTP to IRISH WATER Standards
Ballyhilty WTP	Upgrade WTP to IRISH WATER Standards
Caheragh WTP	Upgrade WTP to IRISH WATER Standards
Reenmeen Woods WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Lee Road WTP	Upgrade WTP to IRISH WATER Standards
Caherdaniel WTP	Upgrade WTP to IRISH WATER Standards – Potential site for a containerised solution
Castlecove (Gowlane) WTP	Upgrade WTP to IRISH WATER Standards
Waterville WTP	Upgrade WTP to IRISH WATER Standards
Kenmare WTP	Upgrade WTP to IRISH WATER Standards and develop an emergency source
Kilgarvan (Glanlough) WTP	Upgrade WTP to IRISH WATER Standards
Lauragh WTP	Upgrade WTP to IRISH WATER Standards
Sneem WTP	Upgrade WTP to IRISH WATER Standards
Ballydasoon WTP	Refurb existing Boreholes, and upgrade WTP to IRISH WATER Standards

Small Towns and Villages Growth Programme Irish Water’s Investment Plan 2020-2024 includes a number of programmes and projects targeted at providing for growth. One such programme is the Small Towns and Villages Growth Programme (STVGP) which will provide funding for Water and Wastewater Treatment Plant growth capacity in smaller settlements which are not otherwise provided for in the Capital Investment Plan 2020 to 2024. The STVGP is focused on supporting growth in areas already served by IRISH WATER infrastructure but where current or future capacity deficits have been identified.

Irish Water have engaged with Local Authorities across the country to ensure that the investment is made appropriately in accordance with the relevant county development plan. Under this programme interim options works will be considered for Clonakilty WRZ.



7

Preferred Approach – Sensitivity Analysis

7 Preferred Approach – Sensitivity Analysis

Our supply demand forecast, and water quality barrier deficit assessments have been developed using the application of best practice methods within the data available. We have identified areas where we will focus improvements in data to improve the certainty of our forecasts. However, all long-term forecasts are subject to uncertainty. We have explored the sensitivity of our supply and demand forecasts to some of the key factors which influence them through a range of scenarios. This enables us to test the sensitivity of the Preferred Approach to changes in need, in order to ensure that our decision making is robust and that the approach is adaptable. We describe the factors which we have been considered in Chapter 8 of the Framework Plan. In summary we test our Preferred Approach against the following questions:

- 1) What if the deployable output across our supplies is reduced based on sustainability limits within the new legislation on abstraction resulting in a larger supply demand balance deficit?
- 2) What if climate change impacts on our existing supplies are greater than anticipated?

- 3) What if our forecasts are too great and expected demand growth does not materialise resulting in a smaller supply demand balance deficit?
- 4) What if we are able to achieve SELL and 21% leakage targets in our larger WRZs within the timeframe of the plan resulting in lower Needs?
- 5) What if we fail to achieve our leakage targets?

A summary of the adaptability criteria and analysis we have undertaken for SAI is shown in Table 7.1.

Table 7.1 Sensitivity Analysis for SAI

Uncertainty	Likelihood	Increase/Decrease in Deficit	Impact on Preferred Approach
Sustainability	Moderate/High (as our current abstractions are large compared to the water bodies from which they abstract)	+30,200 m ³ /d	<p>The impact of sustainability reductions would reduce the volumes that can be abstracted from our existing sources therefore increasing the supply demand balance deficit.</p> <p>There are several surface water sources in SAI that would be impacted from sustainability reductions. However, our preferred approach is designed to relieve pressure on these sources by supplementing from new more resilient surface water and groundwater sources. Groundwater sustainability is more difficult to assess at desktop level, however, as the abstractions in SAI are small in scale, they do not appear to be problematic.</p> <p>Based on this scenario, the Preferred Approach remains the optimal solution.</p>
Climate Change	High (international climate change targets have not been met)	+3,000 m ³ /d	<p>Higher climate change scenarios would impact our existing supplies and result in decreased water availability at certain times of year.</p> <p>Although the likelihood of this scenario is high based on climate change adaptation to date, potential impacts may be mitigated against by optimizing our operations on a more environmentally sustainable basis across the range of supplies.</p> <p>Based on this scenario, the Preferred Approach remains the optimal solution.</p>
Demand Growth	Low/Moderate (growth has been based on policy)	-50,366 m ³ /d	<p>The impact of lower than expected growth would reduce the supply demand balance deficit and the overall need requirement. The supply demand balance deficit is spread across 89 individual water resource zones and is driven by quality as well as quantity issues. In this rural area, growth is relatively low.</p> <p>Based on this scenario, the Preferred Approach remains the optimal solution.</p>

Uncertainty	Likelihood	Increase/Decrease in Deficit	Impact on Preferred Approach
Leakage Targets	Low (Irish Water is focused on sustainability and aggressive leakage reduction)	2,294 m ³ /d	<p>The impact of lower than expected leakage savings would increase the supply demand balance deficit and the overall need requirement.</p> <p>Due to the length and condition of our networks, we could potentially fail to achieve target leakage reductions within the timeframes set out. However, as Irish Water is committed to achieving leakage reductions, the likely scenario would be an extension in the period of time taken to achieve leakage targets as opposed to accepting lower targets.</p> <p>Based on this scenario, the Preferred Approach remains the optimal solution.</p>
	Moderate/High (Irish Water is focused on sustainability and aggressive leakage reduction)	-40,994 m ³ /d	<p>The impact of achieving SELL and 21% leakage targets in our larger WRZs would reduce the supply demand balance deficit and the overall need requirement.</p> <p>The need drivers in SAI are across all 89 water resource zones and are driven by quality as well as availability issues. Therefore, the Preferred Approach is required, even accounting for increased leakage savings.</p> <p>Based on this scenario, the Preferred Approach remains as the optimal solution.</p>

In reality, a combination of these scenarios may occur together. For example, growth in demand might be lower if we achieve greater leakage reductions. However, if this coincided with a reduction in permitted abstraction volume under the abstraction licensing regime, the reduction in demand may offset some or all of the loss in supply availability due to abstraction sustainability reductions.

Based on the adaptability assessment, the Interim and Preferred Approaches perform as follows:

- Interim Approach – As the purpose of the Interim Approach is to allow for priority Quality and Quantity issues, the solutions will have a limited design life (usually less than 10 years). They allow time to assess the Preferred Approach and improve adaptability within our Plan.
- Preferred Approach – Many supplies in SAI are relatively small, and as conservative limits have been applied to the supply availability assessments, the Preferred Approach is adaptable to a range of future outlooks in relation to sustainability and climate change. The demand growth in the area is small, and the Supply Demand Deficits are primarily driven by reliability. As Water Treatment Plants are modular, capacity will be delivered on a phased basis, allowing for adaptation across a range of futures. Our Preferred Approach is therefore Adaptable.

In summary, our sensitivity assessment of the Interim and Preferred Approaches demonstrates that they are both highly adaptable to a broad range of futures, and therefore represent ‘no regrets’ infrastructure.



8

Summary of Study Area I

8 Summary of Study Area I

The Preferred Approach for SAI (summarised in Table 5.9 and Figure 5.5 of Section 5.4) 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 benefit, particularly as six (6) of these are identified in Section 2.4 as abstractions which may not meet sustainability guidelines during dry weather flows, at Tibbotstown, Castletownbere, Glengarrif, Allihies, Cahermore and Caherdaniel/ Castlecove WRZs.

Delivery of the Preferred Approach will secure all of the supplies in the area in terms of Quality, Quantity, Sustainability and Resilience. The Preferred Approach for SAI Cork and 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 2,294 m³ 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

As part of our Preferred Approach we have also identified a range of interim emergency solutions for SAI, as summarised in Table 6.1 in Section 6. The measures will only be progressed in the event of critical need and/or public health impact and to allow time for delivery of the required Preferred Approach solutions in the Study Area.

Annex A

Study Area I Water Treatment Plants

WTP Asset Name	Local Plant Names
Watergrasshill WTP	Watergrasshill WTP
Carhue WTP	Carhue WTP
Clashanamid WTP	Clashanamid WTP
Newcestown WTP	Newcestown WTP
Mossgrove WTP	Mossgrove WTP
Knockraha WTP	Knockraha WTP
Ratharoon WTP	Ratharoon WTP
Bayview WTP	Bayview WTP
Ard Na Killy Ridge WTP	Ard Na Killy Ridge WTP
Cullen WTP	Cullen WTP
Nohoval WTP	Nohoval WTP
Roberts Cove WTP	Roberts Cove WTP
Minane Bridge WTP	Minane Bridge WTP
Ballinagree WTP	Ballinagree WTP
Ballingeary WTP	Ballingeary WTP
Ballymakeera WTP	Ballymakeera WTP
Clondrohid WTP	Clondrohid WTP
Inchigeelagh WTP	Inchigeelagh WTP
Kilnamartyra WTP	Kilnamartyra WTP
Macroom WTP	Macroom WTP
Coolehane WTP	Coolehane WTP
Kilnagorteen WTP	Kilnagorteen WTP
Ballyveerane WTP	Ballyveerane WTP
Carrignadoura WTP	Carrignadoura WTP

WTP Asset Name	Local Plant Names
Bilberry WTP	Bilberry WTP
Clash WTP	Clash WTP
Carriglusky WTP	Carriglusky WTP
Ballincurrig WTP	Ballincurrig WTP
Midleton WTP	Midleton WTP
Kilva WTP	Kilva WTP
Tibbetstown WTP	Tibbetstown WTP
Corbally WTP	Corbally WTP
Ballymacoda WTP	Ballymacoda WTP
Dungourney WTP	Dungourney WTP
Inch Cross WTP	Inch Cross WTP
Ballymacoda Road WTP	Ballymacoda Road WTP
Killeagh (Youghal Rd) WTP	Killeagh (Youghal Rd) WTP
Kilcraheen WTP	Kilcraheen WTP
Knockadoon WTP 1	Knockadoon WTP 1
Knockadoon WTP 2	Knockadoon WTP 2
Mogeely WTP	Mogeely WTP
Walshtown Beg WTP	Walshtown Beg WTP
Glendine WTP	Glendine WTP
Ballykilty WTP	Ballykilty WTP
Knockburden WTP	Knockburden WTP
Templemartin WTP	Templemartin WTP
Garranes WTP	Garranes WTP
Knockanleigh WTP	Knockanleigh WTP
Aghabullogue WTP	Aghabullogue WTP
Donoughmore WTP	Donoughmore WTP

WTP Asset Name	Local Plant Names
Grenagh WTP	Grenagh WTP
Rylane (Creamery) WTP	Rylane (Creamery) WTP
Rylane (Cross) WTP	Rylane (Cross) WTP
Stoneview WTP	Stoneview WTP
Vicarstown WTP	Vicarstown WTP
Ballyshoneen WTP	Ballyshoneen WTP
Coolineagh WTP	Coolineagh WTP
Carrignavar WTP	Carrignavar WTP
Glashaboy WTP	Glashaboy WTP
Whitechurch WTP	Whitechurch WTP
Inniscarra WTP	Inniscarra WTP
Innishannon WTP	Innishannon WTP
Derryginagh WTP	Derryginagh WTP
Durrus WTP	Durrus WTP
Kealkill WTP	Kealkill WTP
Kilcrohane WTP	Kilcrohane WTP
Whiddy Island WTP	Whiddy Island WTP
Dromore WTP	Dromore WTP
Croterra WTP	Croterra WTP
Cahernacrin WTP	Cahernacrin WTP
Adrigole WTP	Adrigole WTP
Ballydonnegan WTP	Ballydonnegan WTP
Allihies WTP	Allihies WTP
Cahermore WTP	Cahermore WTP
Castletownbere WTP	Castletownbere WTP
Dursey Island WTP	Dursey Island WTP

WTP Asset Name	Local Plant Names
Glengarriff WTP	Glengarriff WTP
Clonakilty (Jones Bridge) WTP	Clonakilty (Jones Bridge) WTP
Lyre (Clonakilty) WTP	Lyre (Clonakilty) WTP
Coppeen WTP	Coppeen WTP
Dunmanway WTP	Dunmanway WTP
Terelton WTP	Terelton WTP
Johnstown WTP	Johnstown WTP
Cluain Court (Allihies) WTP	Cluain Court (Allihies) WTP
Crookhaven WTP	Crookhaven WTP
Goleen WTP	Goleen WTP
Toormore WTP	Toormore WTP
Baltimore (Lake Cross) WTP	Baltimore (Lake Cross) WTP
Cape Clear WTP	Cape Clear WTP
Drinagh WTP	Drinagh WTP
Ballyhilty WTP	Ballyhilty WTP
Caheragh WTP	Caheragh WTP
Reenmeen Woods WTP	Reenmeen Woods WTP
Lee Road WTP	Lee Road WTP
Caherdanel WTP	Caherdanel WTP
Castlecove (Gowlane) WTP	Castlecove (Gowlane) WTP
Waterville WTP	Waterville WTP
Kenmare WTP	Kenmare WTP
Kilgarvan (Glanlough) WTP	Kilgarvan (Glanlough) WTP
Lauragh WTP	Lauragh WTP
Sneem WTP	Sneem WTP
Ballydasoon WTP	Ballydasoon WTP

Annex B

Study Area I Rejection Register Summary