



Method Statement: Options Appraisal

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A consultation on the WRSE Method Statements was undertaken in Autumn 2020 – the consultation details can be viewed on the WRSE engagement hq platform at <u>https://wrse.uk.engagementhq.com/method-statements.</u>

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Executive Summary

Water Resources South East (WRSE) is developing a multi-sector, regional resilience plan to secure water supplies for the South East until 2100.

We have prepared method statements setting out the processes and procedures for preparing all the technical elements of our regional resilience plan. We consulted on these early in the plan preparation process to ensure that our methods are transparent and, as far as possible, reflect the views and requirements of customers and stakeholders.

This method statement covers the regional options appraisal and Figure ES1 illustrates how this contributes to the preparation process for the regional resilience plan.



Figure ES1: Overview of the Method Statements and their role in the development of the plan

Method Statement: Options Appraisal November 2022 The aim of the options appraisal task is to identify the feasible set of options that will be available for selection to address the future water needs as part of the best value planning process and to improve consistency of option information.

The options information provides the evidence on which we will have to make decisions about which options to include in our regional resilience plan – and what investment to be included in company Water Resources Management Plans (WRMPs) and business plans.

This method statement provides:

- A clear explanation of the background, objectives and components of the options appraisal;
- A high-level outline is provided of how the regional level and WRMP level options assessments inform each other so that they are based on common and consistent information and this is illustrated in an overall process diagram (Figure ES.2); and
- The option types being considered along with the option information being collated to enable the assessment of the options.



Figure ES.2 WRSE Integrated options appraisal methodology

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1 Introduction

Overview

- 1.1 In February 2020 Water Resources South East (WRSE) published its initial Future Water Resource Requirements for South East England, based on the six member companies' WRMP19. In February 2021 WRSE published an update to this and a further summary was published in September 2021, setting out the projected planning challenge that the regional plan will need to meet.
- 1.2 Ahead of the development of the draft regional plan, WRSE has carried out an appraisal of the water resource options that could be used to address the future deficits in water supplies. This has included existing options and new options which have been identified through WRSE's engagement process. The best value investment planning process will identify which water resource programme or set of options will best meet the future water needs of the region. The following phases have been set for the regional options appraisal:
 - Phase 1: Scoping phase for the invitation to tender for services
 - Phase 2: Options appraisal (between Spring 2020 and March 2021) including option identification, screening, costing and environmental assessment outlined in the <u>Water Resources Planning Guideline</u> (<u>WRPG) Section 8.0</u>. This covers activities up to the upload of data to the WRSE Data Landing Platform (DLP) and before investment modelling, best value plan appraisal of options and decision making, which is covered in other WRSE Method Statements. Figure 1 illustrates the scope of this Method Statement and how it relates to other parts of the process and other Method Statements.
 - Phase 3: Continuation tasks (post March 2021) e.g. new options and option updates, refinements.





1.3 This method statement provides the information to show how as a region, WRSE has and will work collaboratively to undertake the initial appraisal stage of the available options up to the DLP. The option

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appraisal has been developed to meet best practice expectations and to be inclusive for stakeholders, whilst also being carried out in accordance with guidance published by the Environment Agency, e.g. the <u>National Framework for Water Resources</u> and the <u>Water Resources Planning Guidelines</u>, and considering other sector demands.

- 1.4 To ensure fairness to options from both inside and outside the region, options are assessed consistently, objectively and transparently. The WRSE regional policies consultation undertaken in summer 2020, proposed that potential import options should be assessed to at least the same standards and principles as all other options in the region.
- 1.5 In most cases the options appraisal and development has been conducted by water companies, however for catchment management and nature-based solutions, multi-sector options and some transfers, initial option development has been conducted at a regional level by WRSE. Where options development and appraisal have been undertaken at regional level this method statement sets out our process to assess options which is balanced, objective and follows the appropriate guidance. We have also clearly signposted to where companies undertook the screening of options, prior to their information submission to WRSE.

Summary of outputs

- 1.6 The regional options appraisal workstream involved undertaking a regional options appraisal gap analysis to identify potential gaps in the option set, collating a comprehensive set of existing options, improvements in consistency across option screening and design criteria and the development of new options where the potential was identified.
- 1.7 An appraisal of Public Water Supply (PWS) and non PWS supply options has been undertaken to address the challenges the region faces between 2025 and 2100. Further, options that will deliver multiple benefits to people, the environment and other sectors are being developed. Options considered include: new water supplies and infrastructure; green infrastructure; demand management; and interventions used to manage drought events. Figure 2 provides further summary information on these option types and Appendix 1 provides a full list of option sub-types under consideration.



- 1.8 Appendix 3 provides a list of option information that is required for each constrained feasible option to be uploaded into the regional options database for investment modelling. A more limited data set is required for options rejected during screening, but a rejection rationale is required for regulatory reporting from the options database.
- 1.9 In addition to the option information in Appendix 3, WRSE will be assessing the following metrics for each option:
 - Environmental metrics see Method Statement 1329 WRSE Environmental Assessment
 - Resilience metrics see Method Statement 1325 WRSE Resilience

Roles and Responsibilities

- 1.10 Key roles and responsibilities are as follows:
 - WRSE Technical Director: Meyrick Gough
 - Overall responsibility and accountability for the technical delivery of the WRSE programme
 - WRSE Option Appraisal Manager/Lead: Nick Honeyball, Affinity Water (WRSE PMB)
 - Overall responsibility and accountability for the technical delivery of the workstream
 - Overall responsibility for the budget proposal
 - WRSE Option type leads: Programme Management Board (PMB) Members
 - Responsible for the scope and delivery of each of the sub-option workstream areas

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- Consultants: Mott MacDonald
- Consultant Project Principal: Alice Mortimore
- Consultant Technical Principal: Bill Hume-Smith
- Consultant Work Package Lead: Rob McNicoll
- The WRSE options appraisal workstream governance structure contains a RACI (responsibility assignment matrix) structure and the consultants supporting the work have submitted a governance structure to WRSE PMB.
- The WRSE PMB hold responsibility and accountability for approving all technical works on behalf of WRSE according to the programme requirements and budget.
- WRSE Programme Manager: Sarah Green

Maintenance of method statement

- 1.11 Key updates to this method statement
 - 1st draft version June 2020
 - 2nd draft version July 2020 (to publish online for consultation)
 - Revised draft after consultation (September 2021)
 - Minor updates for Draft Regional Plan
 - Iterative update/s (to follow where required)

2 Options appraisal methodology

An integrated approach to regional options appraisal

2.1 Figure 3 shows how the WRSE options appraisal is integrated with the water companies' WRMP option appraisal and the wider programme requirements for environmental, resilience and water quality assessments. The methodology has been developed in this way to ensure improvements in consistency across the company approaches so that material options are not overlooked and the inputs to the investment model are consistent. Furthermore, the outputs need to then be suitable for use in water company WRMPs.

Figure 3: WRSE Integrated options appraisal methodology



- 2.2 The options appraisal approach being undertaken by WRSE and the companies promotes integration between the regional and water company WRMP options appraisals, allowing both to actively inform the other.
- 2.3 A key component of the methodology has also been the work that three of the WRSE companies are progressing with RAPID (the Regulators' Alliance for Progressing Infrastructure Development) which includes Ofwat, the Environment Agency and Drinking Water Inspectorate (DWI). This work includes the development activities for a number of strategic water resource options (SROs) identified by Ofwat in its PR19 Final Determination <u>strategic regional water resource solutions appendix</u> and also the findings of a <u>strategic options gap analysis</u> conducted by Ofwat.

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- 2.4 WRSE prepared guidance¹ for its member companies on the options appraisal process, informed by a review of previous approaches across the WRSE companies. Figure 4 shows the stepped process for the option appraisal in this method statement and identifies those activities undertaken by WRSE at a regional level and those activities conducted by individual water companies.
- 2.5 WRSE have undertaken a sampled review of each company's rejection register to ascertain the basis for excluding options and have provided guidance on how to strengthen the rationale and audit trails in alignment with the WRMP24 guidance. The rejection registers have been updated by the companies to ensure that there is a robust rejection rationale which is recorded on the WRSE options database.
- 2.6 As part of the review of the company option screening work from WRMP19, WRSE reviewed the potential for company options to provide wider regional benefit. Where potential for this was identified, companies were informed of the opportunities and when updating option screening, companies were advised to consider the potential needs of neighbouring companies as well as their own needs.
- 2.7 There are a number of 'decision and hand-off points' between the company and the regional level option appraisals, these start with acceptance of the screening recommendations by the companies and include the following:
 - Re-screened option lists by the companies inclusive of new regional options (either feasible lists, or constrained feasible lists if the feasible list has been subject to further screening)
 - Submission of the rejected options with rationale for rejection (included on the unconstrained lists)
 - Option information upload to the regional database (option data)
 - An information share (as set out in Appendix 4 with the EA/NE) with regulators
 - Iterative updates to the regional option database via option 'windows' for new information (third party options, updates to strategic regional options)
- 2.8 As part of the consultation on this method statement, the EA requested further information in the final version on the 'rationale for rejecting/progressing options'. The rationales for decisions on option progression are subject to the water company screening approaches and will be included in a rejection register that will be published alongside the draft regional plan for consultation.
- 2.9 It should be noted that the Environment Agency's Water Resources Planning Guideline is now final, and this method statement has been cross checked against this to ensure it is aligned (See Appendix 5 for check list).

¹ Mott MacDonald (October 2020) Options Appraisal - Guidance on option identification, screening and development



Figure 4: An overview of the process for identifying and screening options



Note 1: Screening processes will vary between companies and may include a one or two stage approach, company specific feedback has been provided to improve robustness of option screening Note 2: The Option List for Investment Modelling may be the full Feasible List of options, or a Constrained Feasible List, where this has been agreed with stakeholders (including the EA), provided that care is taken when constraining the Feasible List to ensure options that could benefit other companies are not rejected at this stage.

Note 3: Demand management options are represented as strategies comprising baskets of consumption and leakage reduction options combined by Water Companies to achieve different levels of total demand reduction

Note 4: WRSE option identification, screening and development activities focused upon catchment management, multi-sector and strategic transfer options

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Demand side options

Background

- 2.10 The National Framework for Water Resources published by the Environment Agency in March 2020 set out the expected targets for leakage and household per capita consumption (PCC) reduction by 2050 in comparison to current figures. These are:
 - Leakage to be reduced by 50%
 - PCC regional level of 110 litres per person per day (a reduction of around 30-35%)
- 2.11 Demand management (DM) options go beyond traditional approaches of just volumetric savings to consider schemes associated with improving the environment and resilience. DM options include:
 - Leakage reduction (distribution network and customer supply pipes)
 - Water efficiency (behaviour change and physical interventions at household level)
 - Metering (conversion from fixed rate to metered tariff, smart metering)
- 2.12 The WRSE companies provided a range of demand management strategies (DMS) for leakage and usage reductions, and cost information for different weather scenarios, via a DMS Template, for the purposes of the WRSE investment modelling. It is a requirement that the DMS and option information will be aligned and consistent across companies.

Approach

2.13 To investigate potential alignment issues, a questionnaire survey was completed that focused on the WRSE water companies' demand forecasting approaches and the methods used for the development of demand management options and strategies. The surveys were followed up with interviews. The information provided was analysed to determine similarities, differences and materiality of the dissimilarities. Some alignment issues were identified and recommendations/proposals² were made to address these for the companies to use in populating their DMS templates in a consistent fashion.

Outputs

- 2.14 It was determined that the DMS template should be applied at the WRZ level. The template will incorporate three [Low/Medium/High] demand management strategies for consumption and leakage reductions. WRSE has provided guidance on how companies should develop the strategies and definitions for completing the DMS templates. Portsmouth Water have also investigated a High Plus strategy that included universal metering.
- 2.15 Guidance provided to companies on the use of a consistent framework of methods includes recommendations for forecasting to a planning period of 2100, application of outcome-based uncertainty bands, treatment of savings from water labelling options and DYCP (dry year critical period) forecasting of leakage and usage reduction savings.

² Mott MacDonald, March 2021, Task 4e Technical Note, Alignment of Demand Management Strategies & Options



- 2.16 Guidance was also provided on deriving the DMS, consistent with the regulatory Water Resources Planning Guideline (WRPG), the Environment Agency's National Framework and the period of water efficiency benefit. For the leakage reduction strategies guidance was provided on estimating volumes of water saved from targeted customer supply pipe measures and from application of Active Leakage Control (ALC) innovative/new technologies to fixing leaks.
- 2.17 For data assurance purposes, a checklist was provided of what should be checked to assess the composition of the leakage and usage reduction forecasts against the WRPG requirement and a note of considerations to avoid double counting of savings from inter-dependencies of individual DM options.
- 2.18 All companies have looked at potential savings resulting from government led demand management interventions.

Supply side options

- 2.19 A regional option gap analysis has been conducted including a review of a sample of rejected options from WRMP19. This identified recommendations on option identification, screening and option development consistency which were provided to the companies. Companies have then updated their options appraisal and uploaded the information back to WRSE.
- 2.20 WRSE have not applied a minimum size threshold to filter the supply options because even smaller local options can be important to meet demands when aggregated, though schemes of less than 1MI/d are usually not meaningful at regional scale.
- 2.21 An important aspect of the WRSE work is to explore opportunities for improvements across the region in inter-connectivity between water resource zones (both with in water companies and between water companies). WRSE has undertaken supply demand balance modelling to identify opportunities not already included in option lists where new transfers could release 'trapped' surplus water or transfer water from new strategic options to other areas of need in the region.
- 2.22 In order to develop work with other sectors, WRSE set up a strategic working group with the following sectors, agriculture and horticulture (NFU, West Sussex Growers)), energy producers, paper and pulp producers, water cress producers, aggregate industry and golf. The group will assess the future demands of these sectors and work with the options team to ensure where options do emerge, they can be translated into the options appraisal process.
- 2.23 Another key alternative option type are nature-based solutions within catchments. The scope for these options has focused on a) the incorporation of existing catchment options and b) undertaking catchment workshops to facilitate the identification of new catchment option ideas. The catchment workshops were held in 2020 with catchment partnerships and other local stakeholders. They focussed on identifying catchment solutions. A process was then developed for screening and developing information for catchment management options for inclusion in investment modelling.



- 2.24 In order to facilitate the promotion and bespoke screening of new multi-sector options, WRSE has developed online facilities to collate and assess new options. Online forms for submitting new options were provided and Appendix 2 summarises the assessment process.
- 2.25 The principles we will follow when sharing information with the Environment Agency and Natural England are set out in Appendix 4, and we will seek to undertake this at an optimal time to reduce the burden on all parties involved.

Strategic resource options (SROs) and the RAPID options (gap analysis)

- 2.26 Three of the WRSE companies (Affinity, Thames and Southern Water) are working with water companies in neighbouring regions to further develop large scale SROs within the context of the RAPID 'gated process'.
- 2.27 WRSE is working closely with the companies involved in developing the SROs in the following ways:
 - By supporting these companies with a good understanding of the regional programme requirements (option information and timing) for the inputs to the regional planning process
 - By providing these companies with expectations and methods for consistency of approaches for use in the options assessment work
 - By assessing environmental and resilience metrics for SROs
 - By working with RAPID where required and understanding the requirements to integrate the work emerging in a timely way into the regional planning options assessment such as the gap analysis of the current strategic infrastructure schemes
 - By undertaking regional needs assessment modelling (to support the gated process requirements) as inputs to the RAPID gated process.
- 2.28 This work is necessary to maintain the timely sharing of consistent information and data for the regional plan development, which will read through into statutory WRMPs and which in turn will become the needs assessment for future statutory planning inquiries.
- 2.29 RAPID also undertook a 'gap analysis' of opportunities for increasing availability and sharing of water resources for resilience that may a) have been discounted in previous WRMPs, b) be in the national and regional interest and not previously considered (including multi-sector options) and c) may be in the interest of future WRMPs. Key findings from the gap analysis that have been taken forward for the WRSE region as potential options include:
 - The conversion of a currently active quarry (Mendip Quarries) for use as a water resources reservoir instead of decommissioning it at its end of life for mineral extraction; and
 - Development of a strategic grid within the WRSE region to allow surplus resources to be more fully utilised.



Resilience and drought options

- 2.30 For previous WRMP options appraisals 'resilience options' have not usually been incorporated within the options appraisals. Resilience options include interventions that do not offer deployable output benefit but can operationally support resilience during events such as loss of assets. Due to the focus on increasing resilience and the development of the resilience framework, WRSE have requested that the water companies collate and submit their resilience options for regional appraisal. For further information relating to the resilience framework application, see Method Statement 1325 WRSE Resilience.
- 2.31 Drought options include Temporary Use Bans (TUBs), Non-Essential Use Bans (NEUBs) and drought orders and permits where agreed with the Environment Agency. Some of the drought options from Company drought plans will be included as options in the regional plan. 'More before 4' options (e.g. tankering, and drought orders and permits with major impacts) included in Drought Plans to delay the introduction of Level 4 restrictions (e.g. rota-cuts and standpipes) have not been included in the option list for investment modelling.

Water trading options

- 2.32 WRSE recognises that water companies are working separately with third parties on demand and supply option opportunities through their Bid Assessment Frameworks (BAFs) and that this work may trigger the development of new options (both supply and demand). It is proposed that water companies can include such options via 'update windows' during the plan development, where they can put forward water trading options that may have been identified through this process. By doing so there will be ample opportunity to include water trading innovation in options at regional scale where these may arise.
- 2.33 Where companies are screening third party proposals, these will be subject to the company BAFs which are aligned with company WRMP screening approaches and should therefore be consistent with the screening of alternative options.
- 2.34 As well as seeking offers of resource, WRSE is conducting a systematic analysis to identify potential new bulk transfers that may be beneficial within the WRSE area. This work includes:
 - Using a simple model of WRZs supply-demand balances in the South East to identify where there could be benefits from additional connectivity between zones and to identify capacity envelopes for the potential new transfers; and
 - The identification of start and end points for the potential new transfers, followed by pipeline route selection and development of option information.



3 Progressing the options appraisal

Inputs/requirements

- 3.1 Regional level (consistency)
 - Cross company methods (screening and option development)
 - Design and information (consistency method/s)
- 3.2 WRMP level (option lists)
 - WRMP19 options
 - Resilience options
 - Catchment options
- 3.3 RAPID (National and regional option gap analysis)
 - Findings and implications for WRSE from the <u>RAPID strategic options gap analysis</u>
- 3.4 Other sectors
 - National Framework regional sector demand (Environment Agency's <u>National Framework for Water</u> <u>Resources</u>, and WRSE's <u>Future Water Resource Requirements</u>)
 - Existing options and new options at initial concept level (multi-sector group)

Outputs

- 3.5 Outputs will include:
 - A central regional options database that contains information that is consistent with company WRMPs (options, lists and information) available for water company WRMP sub lists and databases
 - A comprehensive list of options that covers a wide range of generic option types (following the best practice guidance)
 - Regional options appraisal reporting to support water company WRMP24 options appraisal studies (to ensure consistency across the approaches and a gap analysis of regional scale options). These include the following reports:
 - WRSE Options Appraisal Task 1 and 2a Technical Note (Review of rejection registers, gap analysis and screening)
 - WRSE Options Appraisal Task 2b Technical Note (inclusive of Task 4 consistency and design principles)
 - WRSE options appraisal guidance on option identification, screening and development (which brings together and updates the guidance from the two reports listed above)
 - A technical report summarising the outputs of the options appraisal and the options uploaded



 Initial options appraisal 'pre consultation' stage communication with statutory stakeholders (EA/NE) to support WRMP pre consultation.

Data definition and assurance

3.6 Options data is uploaded through excel templates to a Microsoft Azure hosted options database. This information can then be viewed and analysed through Power BI dashboards and is linked to the WRSE investment model. Additional information on upload requirements and templates is provided where necessary to those parties tasked with submitting the information.

Figure 5: Overview of options database



- 3.7 There are two levels of technical assurance on information for input to the regional modelling, which will provide a record of how the data sources have been checked and recorded, these are as follows:
 - Water company level (Level 1): water company assurance process for dWRMP24 and, where applicable, consultant supplier assurance processes up to the point at which information is submitted to WRSE
 - WRSE regional level (Level 2): From the hand-over point where data is received by WRSE, the WRSE assurance process will be undertaken at regional level for all centralised data and information activities.
- 3.8 Where there are further iterations and updates to option information between the companies and WRSE, the same two levels of assurance apply.



- 3.9 The Level 1 assurance process is defined by the water company. An example of this process level might be a 'three line' assurance. Where the company procures expert consultant services to undertake the work on their behalf the first line of assurance would be the quality assurance applied by the consultancy service. The second line would be spot checks and reviews of the data aligned with the WRSE programme deadlines and the third line would be external assurance of the data process to assure the work on behalf of the WRMP and internal company requirements for board assurance.
- 3.10 Where there is a need for targeted assurance for consistency to meet stakeholder expectations, such as application of the cost consistency methodology by companies, these will be defined as required to meet the assurance needs.

Key milestones

- 3.11 Key milestones include:
 - Autumn 2020: Initial option data upload to the WRSE option database (phased during the autumn of 2020). Stakeholder engagement on the method statement.
 - December 2020: Close of first 'window' for new options
 - March 2021: Close of first 'window' for updated option information
 - Spring and summer 2021:
 - Regional modelling in progress, any required revisions to option information included
 - Engagement at option level with the EA and NE (continuing through into autumn/winter 2021)
 - January to February 2022: Second 'window' for updated option information
 - February 2023: Following the update on WRMPs, a third limited opportunity to include option information changes.



4 Summary

- 4.1 This method statement provides a clear explanation of the background, objectives and components of the options appraisal. The method statement and accompanying guidance provides a clear description of the step-by-step process to be undertaken for the regional plan and the steps required to be undertaken by the member water companies.
- 4.2 We have updated this method statement to ensure that the comments provided by stakeholders have been captured and that it is line with the latest WRPG. A summary of the key revisions is provided as follows:
 - A flow process diagram (Figure 1) to show what part of the options appraisal process is contained within this method statement, with signposting to the post DLP stage method statements that cover investment modelling and best value planning (Method Statement 1318 WRSE Best Value Planning).
 - Clarification that information on the rationale for rejecting options will be published with the draft regional plan.
 - The quality assurance process is updated to provide further information.
 - We have also provided additional information setting out how multi-sector, resilience, third party, and catchment management options have been identified and appraised.
 - We have subsequently agreed the engagement approach with the EA and Appendix 4 has been updated to reflect this.
 - An additional website link is included to help interested parties to navigate to the relevant new information on options on the WRSE website.
- 4.3 A high-level outline is provided of how the regional level and WRMP level options assessments will inform each other so that they are based on common and consistent information and this is illustrated an overall process diagram.
- 4.4 The handover points between WRSE and the companies is included, along with the schedule of dates for when these activities will occur (key milestones).
- 4.5 The list of information required for the options appraisal and subsequent modelling is provided in Appendix 3 and where cross referencing to other workstreams is required it is provided (e.g. information provision for resilience and environmental assessments).
- 4.6 The quality assurance and key assumptions are outlined.



5 Next Steps

- 5.1 An initial version of this document was consulted upon between 1st August 2020 to 30th October 2020 and comments received during this time have been incorporated in this version of the method statement.
- 5.2 We have also reviewed this document against the final WRPG and supplementary guidance notes issued by the regulators. We have included a checklist in Appendix 5 to ensure our final version of this Method Statement is in line with the guidance.
- 5.3 If any other further relevant guidance notes or policies are issued, then we will review this Method Statement to see if it needs to be updated.
- 5.4 When we have finalised our Method Statement, we will ensure that we explain any changes we have made and publish an updated Method Statement on our website.
- 5.5 We will update our website with relevant information from time to time to ensure that as new information comes forward stakeholders are kept informed.



Appendix 1: Option Types

The screening approach and the list of option types

An initial generic option list is proposed as follows, developed from the UKWIR Water Resources Planning Tools 2012 Report³, and categorised according to the WRSE high level option types. Some additional Scheme Types and Sub Types have been added. Text in italics is carried forward from the UKWIR generic option type tables and the 'UKWIR Ref' indicates the table number and scheme type number from the UKWIR tables.

Categories	UKWIR Ref	Task 3: Scheme Type / Sub type
Catchment management	5.19	Catchment management schemes - Supporting river flows
Catchment management	5.19	Catchment management schemes - Habitat creation on chalk aquifers
Catchment management	5.19	Catchment management schemes - Flood Storage / Wetland creation
Catchment management	5.19	Catchment management schemes - Reconsider existing fish practices
Catchment management	5.19	Catchment management schemes - River Restoration
Catchment management	5.19	Catchment management schemes - Using SuDs to replenish aquifers
Catchment management	5.19	Catchment management schemes - Nitrate reduction
Catchment management	5.19	Catchment management schemes - Pesticide reduction
Catchment management	5.19	Catchment management schemes - Payments for ecosystem services
Catchment management	5.19	Catchment management schemes - Agricultural Activity
Other	5.18	Water quality schemes that may have the coincidental effect of increasing the deployable output (DO) of a source works

Table 5.1: Blue – Green Infrastructure Generic Option Types

³ UKWIR, 2012, Water Resource Planning Tools (Report Ref. No12/WR/27/6) Economics of Balancing Supply and Demand



Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description		
Consumption reduction	2.1	Compulsory metering - Household	Households in water-stressed areas, Households where a meter or meter box already exists		
Consumption reduction	2.1	Compulsory metering - Selective	Customers with swimming pool, outside taps, sprinkler/hose pipe users		
Consumption reduction	2.1	Compulsory metering - Non- household	Industrial premises, Commercial and public sector premises		
Consumption reduction	2.10	Advice and Information on direct abstraction and irrigation techniques	Drip vs. spray irrigation, Direct abstraction, Other techniques for reducing evaporation		
Consumption reduction	2.11	Advice and information on leakage detection and fixing techniques	Industrial, Commercial and public sector, Household, Agricultural		
Consumption reduction	2.12	Promotion of water saving devices - Retrofitting (new or subsidised)	Replacement of existing fittings (e.g. taps, toilets) in existing housing stock. Appliance exchange programmes - washing machine, dishwasher, water closets or WCs. Company subsidy to appliance manufacturers. Company subsidy to consumers for the purchase of water saving appliances. Limited purchase/use of instantaneous water heaters/boilers. Installation of low volum shower heads, toilet bag cistern dams, water butts, flush controller for urinals etc.		
Consumption reduction	2.13	Water Recycling - grey water reuse (existing household and non-household)	Encouraging or requiring water recycling (i.e. direct use of untreated 'grey water') - industrial, commercial and public sector, households (e.g. using water from baths/showers/basin for toilet use),, fitting recycling systems to existing houses		
Consumption reduction	2.13	Water Recycling - grey water reuse (new household and non-household)	Encouraging or requiring water recycling (i.e. direct use of untreated 'grey water') - industrial, commercial and public sector, households (e.g. using water from baths/showers/basin for toilet use), fitting recycling systems in new houses.		
Consumption reduction	2.14	Sponsoring Water efficiency enabling activities by others	Sponsoring 'waste minimisation' projects, Tradable delivery entitlements, Targeting gardeners for rainwater harvesting, Lobbying for tighter or company- specific water regulations, Improving the enforcement of water regulations, Implement water efficiency research (Waterwise) outcomes, Planning restrictions preventing new development		
Consumption reduction	2.2	Enhanced metering - Household	Where meters are installed compulsorily but then customers encouraged to switch to paying measured charged voluntarily		
Consumption reduction	2.2	Enhanced metering, AMI Smart metering - For all Customers	Targeted installation of water meters and a promotional campaign to increase optant rates and change of occupancy switchers		
Consumption reduction	2.3	Meter Installation policy - Water Company Level	Installation when premises change ownership, Industrial, Commercial and public sector, Households		
Consumption reduction	2.3	Meter Installation policy - Regional / national level			

Table 5.2: Efficient Use and Management of Water Generic Option Types



Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description		
Consumption reduction	2.4	Metering of sewerage flow - To manage water consumption and water wastage	Optional scheme, Compulsory scheme		
Consumption reduction	2.5	Introduction of special fees	Introduction of separate additional fees for, sprinkler users, hose pipe users, outside tap users, swimming pools		
Consumption reduction	2.6	Changes to existing measured tariffs - Drought protection	Including - seasonal, spot pricing for water stressed areas, drought time tariffs, introducing summer/winter or other seasonal tariffs, introducing daily/peak/off- peak tariffs for at least some seasons,		
Consumption reduction	2.6	Changes to existing measured tariffs - Volumetric charges	increasing the volumetric charges, introducing rising block volumetric charges, charge only above a defined subsistence level of use (to protect low income families), flow restrictor charging (tariff reduction for a restriction in domestic supply water pressure)		
Consumption reduction	2.6	Changes to existing measured tariffs - Other	Discontinued declining block rate tariffs, domestic user tariffs and/or commercial user tariffs		
Consumption reduction	2.7	Introduction of special tariffs for specific users	Introducing interruptible industrial supplies, introducing lower charges for major users with significant storage, introducing higher cost ban-free sprinkler or hose pipe licences, Introducing spot pricing for selected customers		
Consumption reduction	2.8	Water use audit and inspection - Household and non- household water efficiency	Domestic property water use audit and retrofit, stand alone, Domestic property water use - audit and retrofit, Integrated Demand Management, Domestic property water use - self audit packs, Commercial property water use - audit integrated with Water Regulations Inspection, Commercial property water use audit, Institutional property water use audit and retrofit		
Consumption reduction	2.9	Awareness campaigns - Targeted water conservation information (advice on appliance water usage)	Industrial customers/bodies, Commercial customers, Households, Public sector (e.g. schools, hospitals, community groups), Recreation facilities (parks and gardens, golf courses), Designers of hot water systems, taps and water using appliances, Purchasers of water-using appliances (i.e. in showrooms), Labelling water consumption of appliances. Customer education on water saving appliances. Encouraging greater use of water saving technology in new and/or existing buildings (industrial, commercial, public sector and household). Encouraging fitting of showers, low volume shower heads, limited purchase/use of power showers, low flush toilets, dual flush toilets, fitting new toilets, composting toilets, waterless urinals, retrofitting existing toilets, shallow trap toilets, flush controller for urinals, timing devices, 'people detectors', self-closing taps i.e. push operation taps that cut off this supply after a short time, spray taps, toilet bag cistern dams (by displacing part of the cistern volume, reduce the flush volume), hose activated by a spring loaded trigger mechanism, research and development into water saving technology.		
Consumption reduction	New	Home visits to reduce plumbing losses	Assistance in repairing leaking toilets. <i>Programme of re-washering customers'</i> taps		
Consumption reduction	New	Reduction in other consumption	Reduction of distribution system operational use, reduction of legal water use that is unbilled & reduction in illegal water use		
Loss reduction	3.1	Customer supply pipe leakage reduction	Identification of major supply pipe leaks, fixing major supply pipe leaks, at water company expense, at customers' expense or subsidised by water company		
Loss reduction	3.2	Leakage reduction - trunk mains and	Find & fix leakage in trunk mains and reservoirs including overflows		



Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description	
		service reservoir leakage reduction		
Loss reduction	3.2	Leakage reduction - Speed and quality of repairs	Changes to policy / organisational setup e.g. fixing of reported and/or detected leaks Increase in repair resources Improved quality of repairs	
Loss reduction	3.5	Leakage reduction - Pressure reduction programmes	New pressure reduction programmes (installation of PRVs) Optimisation of existing pressure management assets Pressure transient reduction	
Loss reduction	3.6	Leakage reduction - (Asset renewal)	Additional leakage-driven mains replacement Small area networks <i>Distribution capacity expansion</i> to relieve constraints and manage pressure	
Loss reduction	4.1	<i>Diagnostic studies</i> for production losses		
Loss reduction	4.2	Improved leakage detection and reduction on raw water mains		
Loss reduction	3.3, 3.4	Leakage reduction - Active Leakage Control	Changes to policy / organisational setup Increase in leakage detection resources Improved efficiency Innovative techniques and technologies e.g. fast logging, fixed noise logging, smart networks	
Loss reduction	4.3, 4.4	Increase water treatment works (WTW) efficiency	Reduce treatment works losses On site wash water recovery	
Loss reduction	New	Leakage reduction - Customer engagement / education / incentives	Advice and information on leak identification and fixing techniques to raise awareness and educate customers to report leaks	
Loss reduction	New	Leakage enabling schemes	e.g. better monitoring and information including night use, investigation to better understand the network, identifying previously unknown consumption, improved meter accuracy and DMA operability, more bulk metering, raw water mains monitoring.	
Other	5.16	Rainwater harvesting	<i>Direct collection and storage of rainwater.</i> May be at domestic or industrial scale (e.g. airports)	
Other	New	Sea water for industrial processes and cooling		
Outage reduction	New	Interventions to reduce outage risk	Interventions to increase source and system reliability, redundancy, resistance, response and recovery to outage events enabling reduction in elements of outage risk, by changing magnitude, likelihood and duration of impacts.	



Table 5.3: Hard Infrastructure Generic Option Types

Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description	
Desalination	5.7	Desalination	Membrane separation (electrodialysis reversal, reverse osmosis), Thermal processes (multistage flash distillation, multiple effect distillation, mechanical vapour compression)	
Groundwater	5.3	Groundwater sources	New sources, improve existing sources (with or without licence change), Increase aquifer yield by reducing seawater intrusion into aquifers, by pumping or through introduction of a physical barrier	
Groundwater	5.5	Artificial Storage and Recovery wells (or Aquifer Storage and Recovery (ASR))		
Groundwater	5.6	Aquifer recharge /Artificial recharge (AR)		
Other	5.15	Tidal barrage		
Other	5.20	Conjunctive use operation of sources		
Other	5.21	Joint ("shared asset") resource		
Other	5.22	Asset Transfers		
Other	5.23	Options to trade other (infrastructure) assets		
Other	5.12, 5.17	Abstraction licence trading	Trading of existing licences. Re-use of existing private supplies taken out of service (Defence establishment sites/Industrial sites)	
Removal of constraints	3.7	Distribution capacity expansion	Trunk mains, Distribution mains	
Removal of constraints	5.10	Redevelopment of existing resources with increased yields	Changes to current system operation that may result in relatively cheap and simple operational changes that could yield benefits to the supply- demand balance	
Removal of constraints	New	Increase water treatment works (WTW) capacity		
Reservoir	5.2	New reservoir	On-stream reservoirs, Pumped-storage reservoirs, Flood storage reservoirs, River regulation reservoirs and/or direct supply reservoir, Development of dis-used gravel pits (or redundant quarries) as reservoirs, Dam raising	
Reuse	5.12	Reclaimed water, water re-use, effluent re-use	Include recycling of sewage, surface water, or wastewater treatment works final effluent for direct or indirect reuse.	
River abstraction	5.1, 5.4	Direct river abstraction	New river abstraction (with intake) and with licence application, Transfer of existing river licence to new or existing works, modify existing abstraction licences. Also includes use of infiltration galleries.	
Import	5.8	Bulk transfers into region	Import of raw or treated water from outside WRSE region. May include renovation or increase of existing transfer or development of new bulk transfers by canal, river or pipeline	
Transfers	5.8	Bulk transfers within region	Transfer of raw or treated water between WRZ/companies within WRSE region: Renovation or increase of existing transfer or development of new bulk transfers by canal, river or pipeline	



Categories	UKWIR Ref	Task 3: Scheme Type / Sub type	Description	
Drought orders	New	Drought intervention - Drought order	Limitation of other abstractions, and further limit customer use of water	
Drought permits	New	Drought intervention - Drought permit	Modification or suspension of conditions in abstraction licences	
Other	2.15	Change in Level of Service to enhance water available for use (WAFU)		
Other	5.13	Imports (icebergs)	Towing of icebergs from the Norwegian sea	
Other	5.14	Rain cloud seeding		
Other	New	Drought intervention - recommission abandoned sources		
Transfers	5.9	Tankering of water - Road Tankering		
Transfers	5.9	Tankering of water - Sea Tankering		
Transfers	New	Drought intervention - Temporary transfer	Transfers between WRZs under mutual aid using existing connections, new transfers, or emergency transfers constructed in drought circumstances	

Table 5.4: Response to Regional Events Generic Option Types



Appendix 2: Appraisal of multi-sector options

Multi-sector options

The National Framework for Water Resources set the objectives for regional plans as follows: "Regional plans will set out how the supply of water for people, business, industry and agriculture will be managed in the region. The plans will create resilient water supplies for all users, while protecting and enhancing the environment and creating wider social benefits for the next 25 years or more. They will be developed collaboratively by water companies, other large water-using sectors and local organisations with an interest in the water environment, who collectively make up regional water resources planning groups."

WRSE is responding to these objectives by developing a multi-sector regional resilience plan that will include solutions to address water resources needs for both Public Water Supply (PWS) and Non-Public Water Supply (Non-PWS) users, while ensuring this is done in a way that delivers environmental benefit and wider social and economic benefit. Figure 6 shows how these objectives overlap. The objective of the regional plan is broader than the objective of WRMPs in that the regional plan include Non-PWS needs, as well as PWS needs. Figure 6 also provides examples of different options that map onto these objectives.

To facilitate identification of multi-sector options WRSE developed a Stakeholder Engagement Tool. The tool used a web-based form, accessible through the <u>WRSE Engagement HQ site</u>, to engage sectors with Non-PWS needs. The tool sought information on:

- 1. Existing abstractors with surplus resources who would be prepared to trade with another sector
- 2. Existing or potential abstractors with a future increased need
- 3. Ideas for new multi-sector options

Where surplus resources are identified then potential new trading options can be developed for either PWS or Non-PWS sectors.

Where there are future Non-PWS needs then these can be added to the PWS needs within WRZs to identify the potential for multi-sector solutions to address both needs.

Where new multi-sector options are identified to address joint needs then there are included in the option set provided that the minimum level of information needed can be provided and the options do not overlap with other option types (e.g. water company demand management strategies).



Figure 6: Characterisation of multi-sector options



Examples of options:

- 1. Home visits to reduce PWS per-capita consumption/New resource development for PWS/Water efficiency audits for PWS customers
- Options to help PWS customers make better use of Non-PWS resources, reducing PWS need
 Option to develop non-PWS for irrigation or
- industry Catchment management, increasing security of PWS and improving environmental water quality.
- Catchment management, increasing security of PWS and Non-PWS supplies and improving environmental water quality
- No till agriculture improving resilience of water in soil profile for agriculture
- River restoration for environmental improvement alone (but likely to have social benefits too?)
- As 4, (catchment benefits) but also providing significant recreational and employment benefit
- As 5 (catchment benefits), but also providing improved flood risk management.
- Wider uptake of regenerative agriculture, landscape scale interventions
- 11. Non-PWS reservoir with amenity value
- 12. Natural flood management measures.
- 13. Flood storage reservoir.

Regional planning scope



Appendix 3 Option Information

Information on options is provided to WRSE using a standard template. The information is then uploaded to an options database. For options that have been rejected by companies during option screening only limited information is required including the option name, reference and rejection reason. For feasible (or constrained feasible) options for investment modelling further information is required which is summarised in the tables below including:

- Summary information on the option (see Table 5)
- Option metric profiles for information that varies over the planning period (see Table 6)
- Option metrics that are single point values and do not vary over time and as such do not need to be profiled Option (see Table 7).

Data field	Brief description	
Option name / ID	Name and WRSE identification reference. Company references can also be added.	
Option Description	A brief description of the option, including the engineering design	
Option stage and type	The option stage allows for real option analysis (e.g. planning, construction). Classification (e.g. reservoir, river abstraction, groundwater etc).	
WRMP19 status and change	Whether an option was selected at WRMP19 and whether it has changed since then, stayed the same, or is a new option.	
DO Tier	The category of options for Deployable Output (DO) assessment	
Minimum flow and capacity (MI/d)	Summary fields on the benefits of the option	
Cost base	The date for which all costs are current for, indexing will be applied to make all costs consistent	
Current asset?	If the option represents a currently operational option, or an option under construction	
Duration (years)	The estimate in years for which how long the option will take to deliver	
Earliest operational start	The earliest date that water becomes available	
Location details	NGRs for locations of key start/end points (inclusive of donor/recipient company names if applicable)	
Rejection details	If scheme is rejected, the reason why and when it was rejected	
Dependencies	 Whether options are: Mutually exclusive Mutually inclusive Reliant of start/completion of another option 	

Table 5: Summary of option information



Table 6: Option metric profiles 75 year (cost and other metrics)

Metric	Brief description		
Costs	 Capital costs (capital expenditure, or 'capex') by asset life category Optimism bias (using consistent cost method) Costed Risk Operating cost ('opex') fixed (£/yr) and variable (£/MI) 		
Deployable Output (DO)	 Yearly profile of DO can be input against a number of scenarios: 1:2 average 1:10 average & peak 1:200 average, peak & minimum 1:500 drought average, peak & minimum 		
Embodied and Operational Carbon	Carbon emissions Fixed (tCO2e/yr) and variable (tCO2e/MI) 		
Other	Electricity Fixed (kWh) / variable (kWh/Ml)		

Table 7: Option non-profiled metric data (resilience, environmental and other metrics)

Metric	Brief description
Resilience	The scoring method for the following resilience metrics are set out in the Resilience Framework Method Statement (Method Statement 1325 WRSE Resilience). Supply Demand Benefit Uncertainty Vulnerability to other Hazards Availability of additional headroom Catchment / Raw water quality risks Capacity of Catchment Services Risk of failure due to exceptional shocks Soil health Expected time to failure Duration of Enhanced Drought Restrictions Operational Complexity System Connectivity Good customer relations for demand management Scalability & Modularity Lead Time Reliance on External bodies Flexibility of planning pathways Collaborative landscape management
Environmental	The scoring methodology for environmental metrics is set out in the Environmental Assessment Method Statement (Method Statement 1329 WRSE Environmental Assessment) • SEA Environmental Benefit Effect • SEA Environmental Negative Effect • Biodiversity Net Gain • Natural Capital
Lead time	Time (in years) required to implement the scheme after being included in an approved WRMP. For real options this time may be separated into planning, development and construction stages.



Appendix 4 Stakeholder preconsultation (EA/NE)

This appendix sets out the approach to pre-consultation for the options appraisal including:

- The need for engagement
- The engagement 'ask' from the WRSE options appraisal team
- The principles and proposed approach
- Agreed approaches to sharing information
- Timely release of information and initial timeframe

The reason for this appendix (the 'need')

The WRSE options appraisal workstream will require engagement with stakeholders as part of the task delivery. The Environment Agency (EA) and Natural England (NE) are key stakeholders for statutory water company WRMPs and therefore will need early visibility of the activities being undertaken by WRSE (which will inform company WMP24 options appraisals).

The type of information that could be part of the engagement include:

- Technical methods
 - Such as changes to the company WRMP screening methods and approaches through
 - recommendations by WRSE to improve consistency across the company WRMP options appraisals Options information
 - Option lists (may change as a result of new information or recommendations made by WRSE)
 - Option scopes and new options may occur (either from WRSE or water company appraisals)

It is recognised that these changes should be managed and organised as efficiently as possible, and that by doing this through WRSE (initially), ahead of WRMP24 pre-consultations we may be able to control the impact on all parties (time and resourcing) and help mitigate the risk of subsequent EA/NE feedback on WRMPs requiring significant changes to the regional plan.

The engagement 'ask'

We would like to engage the EA/NE in these two key areas of our options appraisal work therefore and Table 10 provides an initial list of areas of engagement along with a summary of what feedback we would expect to receive.



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Area of work	Method / Report / Information type	Feedback
Technical methodology	 Phase 1 scoping report Phase 2 regional approach (options appraisal) Approach to option screening Approach to option development and consistent information requirements for the constrained feasible list Phase 3 WRSE options appraisal summary report 	Does the approach to regional planning set out align with your expectations, including those of the WRPG and National Framework? Do you have any comments on the environmental assessment methodology?
Options	 Lists (option database) Changes to unconstrained, feasible lists The rationale for why and which options 	Are you satisfied with the application of the approach for options identification and screening? Are there options on the constrained feasible list that you think should not be included? Are you aware of any gaps in the constrained feasible list?
	 Option level (information) Existing option (with new environmental information) New option creation (and environmental information) 	Do you have any comments on specific option information for investment modelling (e.g. environmental metrics, rejection reasonings)?

The principles we propose to follow to carry out the engagement

We recognise that the EA and NE have limited resources available to undertake the engagement, we also recognise that with the current situation (Covid-19) and restrictions in place that face to face contact is not possible. In order to undertake the engagement, we are currently working on the following principles and tools to help manage the engagement effectively.

- That because a single regional database is held, that is consistent with the company options list, that WRSE will be able to organise the initial sharing of information.
- That the data information platforms will be developed in ways to help facilitate this (e.g. data fields which allow for the sorting of information).
- That we will agree beforehand on the information types and feedback required.
- That we will provide the EA/NE with the information and clearly delineate where the feedback should be provided.
- Agree with the EA/NE on a timeframe for the information share and feedback (we will agree beforehand a schedule).



Summary of agreed approaches to sharing information

Environment Agency approach:

- That companies will continue to engage with the regional contacts on the methodology and technical reporting at regional level
- That option level information will be made available to local teams via water company WRMP teams and the feedback and workshops be held at local level
- That option level information should also be available at regional level (WRSE) to the Environment Agency for visualisation purposes

Natural England approach:

• That WRSE will organise and make available all relevant regional and option level information via the DLP and visualisation tools in order to make the most efficient use of resources

Data on individual options can be made available to the Environment Agency and Natural England through the following means:

- 1. A PowerBI dashboard linked to the WRSE options database providing details of the unconstrained list of options, including rejection reasons for options that have not been taken forward and key option information for those options that have been taken forward for investment modelling (i.e. either on the feasible or constrained feasible lists)
- 2. An ArcGIS Online dashboard showing the location and description of options carried forward, together with the geographical information on the constraints considered in the environmental assessment.

Initial timeframe - Updated

The timing for the engagement is best once the initial data uploading and options appraisal screening stages have been undertaken, along with any activities that could create new options. Options have been uploaded to the WRSE options database in Spring of 2021 and public workshops on the options were held in June 2021. Recordings of the workshops are available from the <u>WRSE Engagement HQ website</u>.

The exact protocol for accessing the data will be agreed with the Environment Agency and Natural England by the WRSE PMB once the technical tasks have been completed to allow access in line with the principles set out in this Method Statement.

In terms of technical methods, the Phase 1 and Phase 2 reports are available for review by the EA/NE. These could be passed to the EA/NE representatives on the WRSE PMB when required, subject to agreement.



Appendix 5 Checklist for consistency with the WRPG

The Environment Agency published its WRPG in February 2021. The following table identifies the relevant parts of the guidance relating to this Method Statement, and provides WRSE's assessment of its consistency with the requirements in the guidance.

WRPG Section No.	Action or approach	Method Statement ref:	WRSE assessment of consistency
8.1, 8.2	Option lists (unconstrained and feasible)	Paragraph 2.4 (and Figure 4) show how the option lists are generated and integrated into the regional option appraisal Paragraph 2.7 explains the 'hand-off' points in relation to the option lists	Consistent with the requirements to identify options from generic option types and integrated between company and regional levels
8.1.1	Regional and third- party options	Paragraph 2.19 references the regional option gap analysis which identifies new regional options (at company level). Figure 3 shows which options are identified at regional level (catchment management, multi-sector and transfers) Paragraph 2.32 and 2.33 reference where third party options can be included within the regional plan (via windows for submission). Where third party option ideas are put forward to WRSE they will be forwarded to water companies.	Shows clearly where regional solutions will be identified. Company level reporting will provide further detail. The approach to working with companies on third party options is consistent with the WRPG
8.2, 8.2.1	Screening and Further screening	Paragraph 2.4 (and Figure 4) shows how the screening of options is integrated between company and regional levels.	The screening methodologies will be made available via company level. The WRSE process promotes and allows for consistency across company level screening



8.2.2	Assessing environmental constraints	The option screening employed for company unconstrained lists includes screening for environmental constraints. For options included for investment modelling the environmental assessment of options is contained within the WRSE environmental assessment Method Statement	Environmental screening of unconstrained option lists is undertaken at company level
8.3	Provision of option information	Option description, DO, lead time, and value metrics (customer, environment and resilience) for the option will all be available via the WRSE DLP Option utilisation will be available post modelling Environmental assessment results will also be available via WRSE (or company level depending on the request)	Some of the option information required for WRMPs will be available from the options database Further information will be needed for company level option dossiers
8.3.1	Cost information	Guidance to companies on cost consistency provided in WRSE options appraisal guidance that aligns with All Company Working Group guidance for Strategic Resource Options.	Approach aligns with WRPG, although noted that in some cases option development may be at a point where not all environmental and water quality interventions have been identified, however such early-stage options are expected to have a higher optimism bias.
8.3.2	Carbon	Embodied carbon emissions are included in the information requirements (Appendix 3), together with power requirements for calculation of emissions from electricity.	Requirement to include carbon emissions is addressed. Further consideration needed on potential for mitigations to reduce embodied carbon.