

2. Introduction

2.1 Background

On 1st January 2014, Irish Water assumed responsibility for managing Ireland's water and wastewater investment and maintenance programmes. On that date, Irish Water also took over the management of the Water Supply Project Eastern and Midlands Region (WSP) from Dublin City Council / Department of Environment, Community and Local Government¹. The project is currently in the 'project planning' stage.

When responsibility for the project was with Dublin City Council, the project was known as the 'Water Supply Project – Dublin Region' as the principal focus was planning for future water supply needs of the East / Dublin Region up to 2050. However, the transfer of water services functions to Irish Water has opened a unique opportunity to take a strategic view of providing water services at a national level and as a result the project has now been referenced to the (three) regions within which Irish Water operates (see Figure 2-1). Since the bulk of water supplies from the project will be delivered to the East & Midlands, the project is now known as the 'Water Supply Project Eastern and Midlands Region (WSP)'.

Management of the planning stage of the project is currently focused on achieving a planning submission to An Bord Pleanála by Quarter 4 2017 (Q4) with a view to delivering an additional source of water throughout the Eastern and Midlands Region by 2024/25.

¹ Now the Department of Housing, Planning, Community and Local Government.

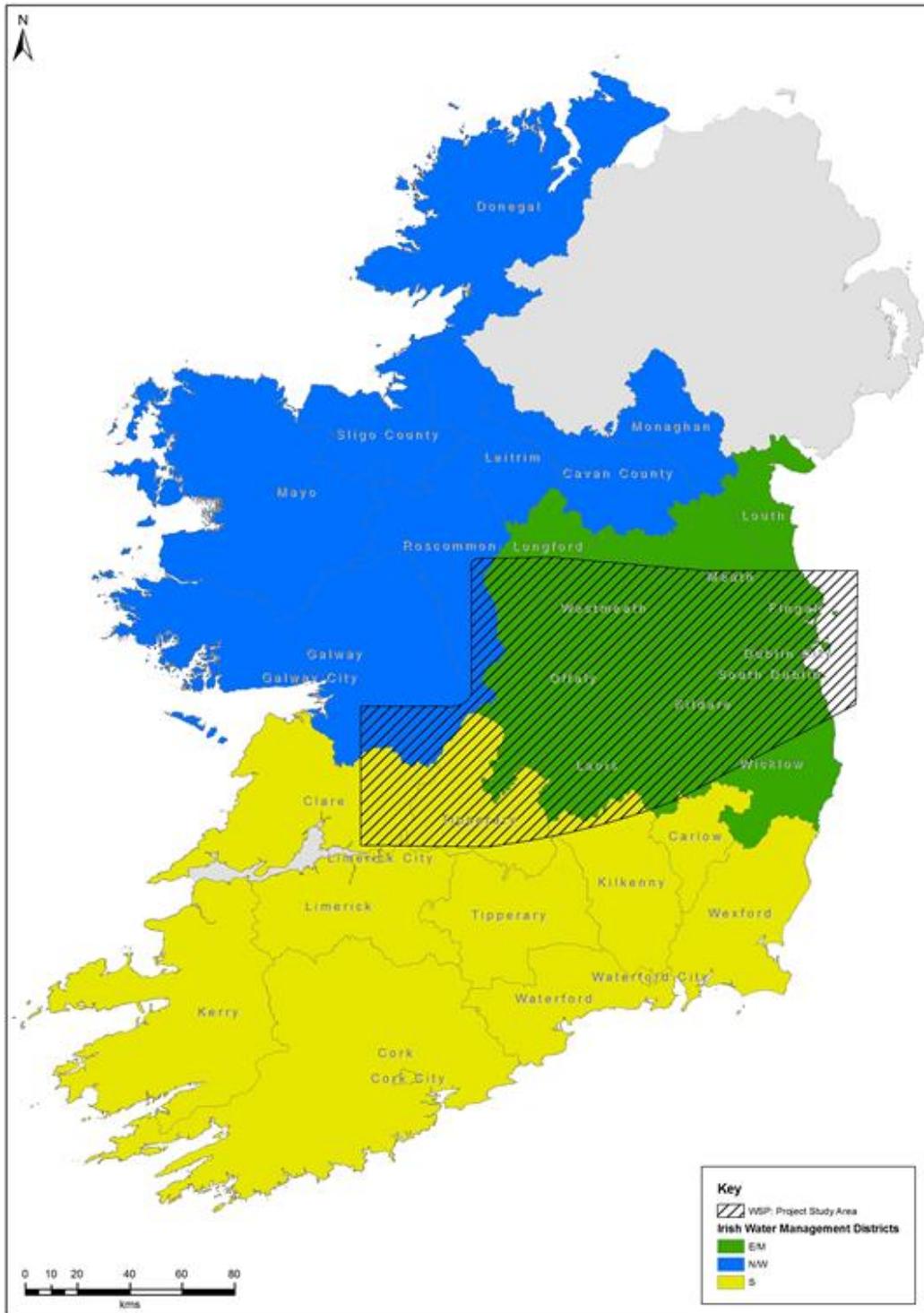


Figure 2-1 Irish Water Regions and WSP Study Area

The transfer of responsibility for managing the project from Dublin City Council to Irish Water has also resulted in an increased focus on potential ‘Benefiting Corridors’ (see Figure 2-2) which will be created by the water transfer pipelines between potential new water source options and the terminal delivery point. This is because Irish Water has responsibility for ensuring secure, resilient and high quality water supplies in all locations of Ireland and not just in the East of Ireland.

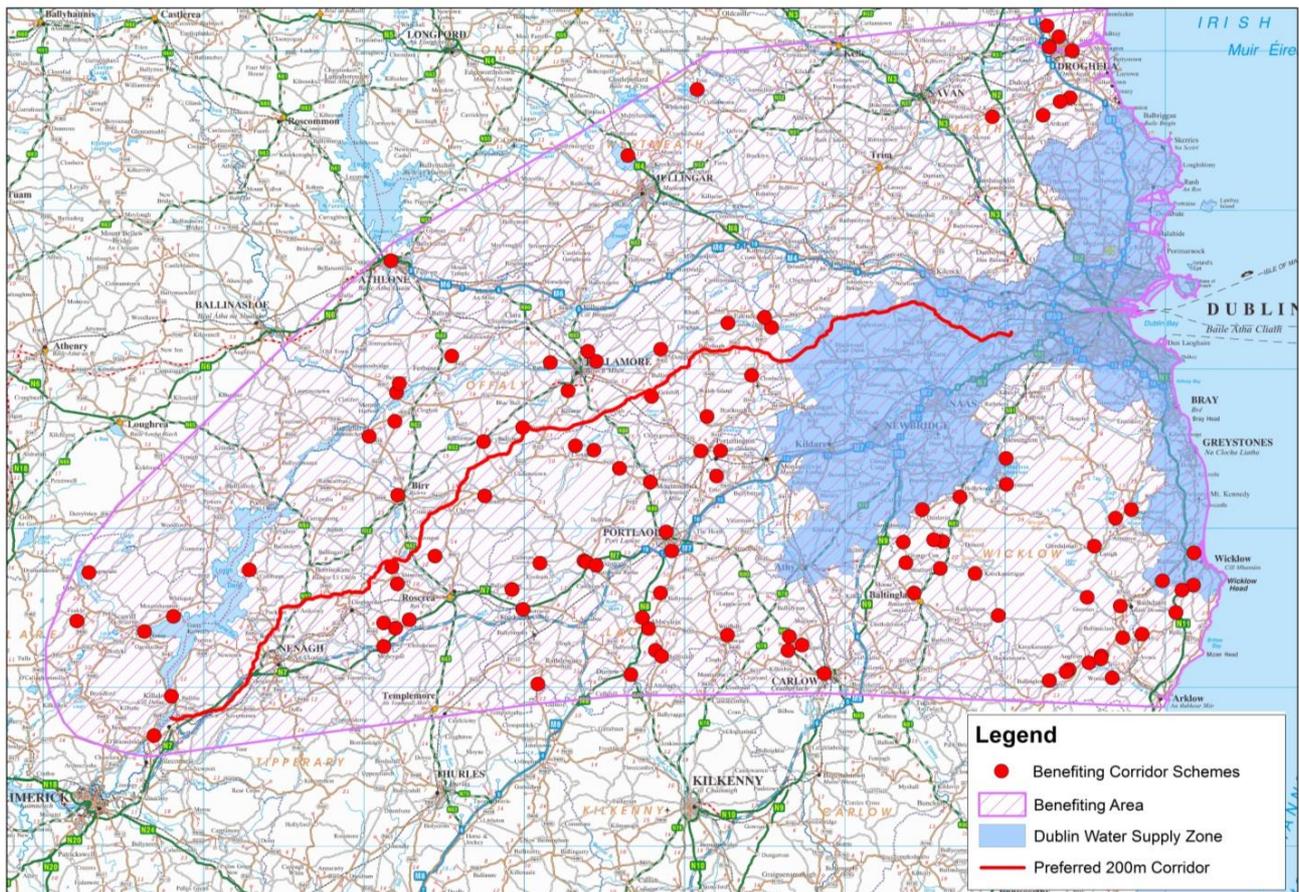


Figure 2-2 Proposed 200m Pipeline Corridor and Existing Water Supplies (Schemes) in potential Benefiting Areas

The ongoing appraisal process² first identified four reasonable and alternative water supply options for further consideration, as they were best capable of meeting the projected demands for the Eastern and Midlands Region, or WSP. Three of these options involved a River Shannon-based source, whilst the remaining fourth option (Desalination) relied on source abstraction from the Irish Sea.

These four options were subsequently evaluated³ and two options which involved abstraction from the north eastern sector of Lough Derg, with or without raw water storage, were not taken forward into the current stage, for environmental reasons related to:

- a) Modelled impact on water residence times in Lough Derg;
- b) Risk of transfer of invasive species; and
- c) The results of ground investigations at an intended raw water storage site at Garryhinch.

Of the two options which remained, the abstraction of water from the Shannon at Parteen Basin was identified as the 'Emerging Preferred Option' over the other remaining option of Desalination. While Desalination remained as the second ranked viable option, it was noted that it was "Dublin-centric", and did not address the problems of small isolated water supplies in the Midlands. Desalination also posed a potentially greater environmental impact through its use of chemicals and high energy consumptions.

This stage of the appraisal is concerned with evaluating both the Emerging Preferred Option and the alternative option of Desalination, in the light of additional modelling data and with the stakeholder feedback from the Preliminary Options Appraisal Report (POAR) public consultation period, in order to identify a Preferred Scheme.

² Water Supply Project Eastern and Midlands Region Water Supply Options Working Paper (June 2015)

³ Preliminary Options Appraisal Report (November 2015)

2.2 Project Consultation Roadmap

The need⁴ for a water supply of 330 Ml/d from a new source has been established and Planning consent to abstract, treat and transfer this water must be obtained, so that a Phase 1 Scheme is in place by 2024/25. An interim review of water demand, taking into account developments since March 2015, is presented in Section 5 of this Report, and phasing is discussed in Section 5.4.

The availability of water from the new source at 2024/25 requires adherence to the project programme, or Road Map (Figure 2-3), to make a Planning Application to An Bord Pleanála by Q4, 2017.

⁴ Water Supply Project Eastern and Midlands Region Project Need Report (February 2015)

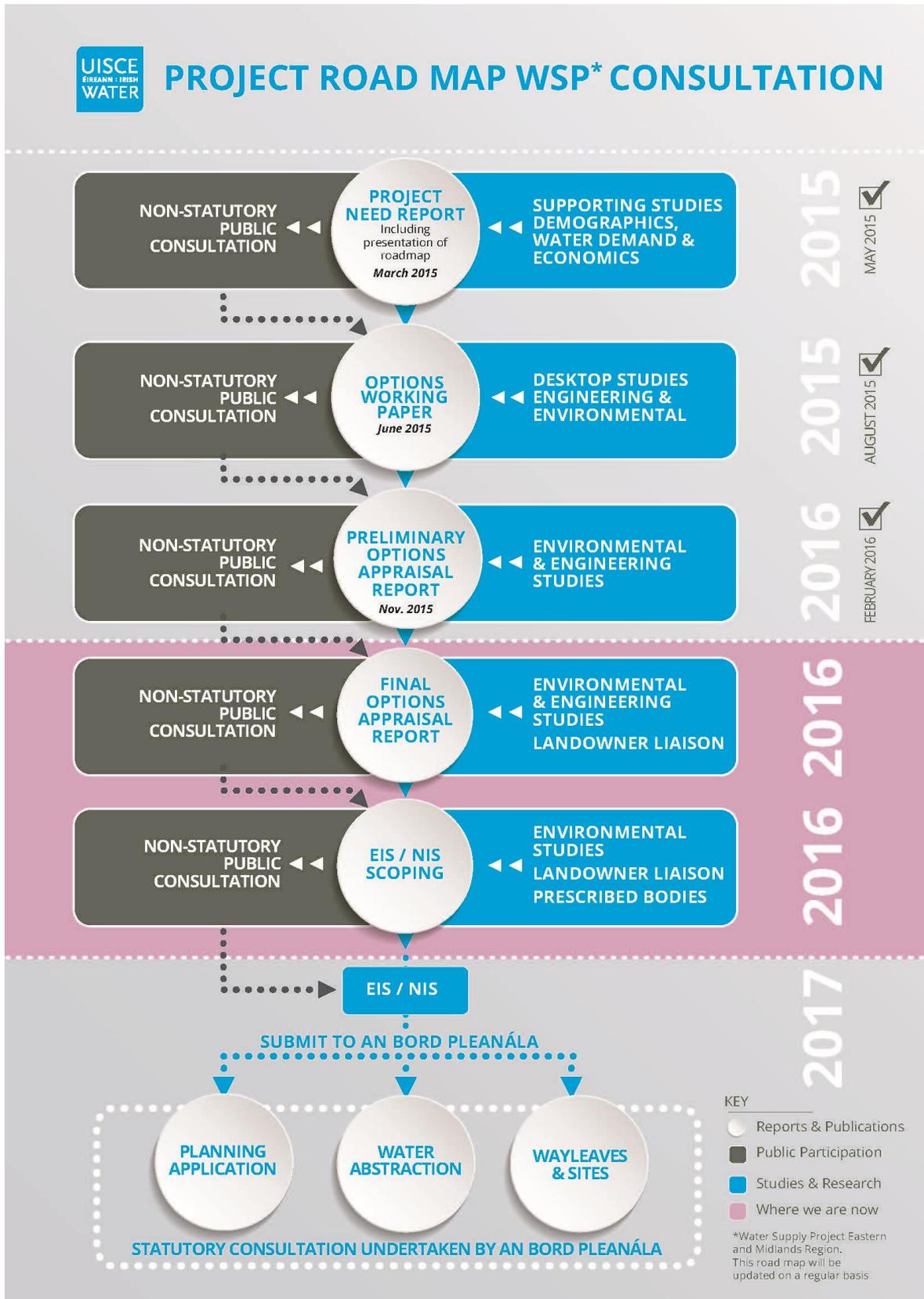


Figure 2-3 Project Consultation Road Map for WSP

The *Project Need Report* (PNR, February 2015), the *Options Working Paper* (OWP, June 2015), and the *Preliminary Options Appraisal Report* (POAR, November 2015) represent Stages 1, 2 and 3 of the Project Road Map respectively.

This document, the *Final Options Appraisal Report*, together with the *EIS Scoping Report*, represents Stage 4 of the Project Road Map; and represents a consultative assessment to identify a Preferred Scheme from the two remaining water supply options evaluated in Stage 3, as well as the proposed scope of the Environmental Impact Statement.

2.3 Previous Work and Reference Studies

The process of identifying an Emerging Preferred Option from the four reasonable alternative options examined in the Preliminary Options Appraisal Report follows a robust programme of previous historical assessments and studies (which are outlined in Figure 2-4), 'on the ground' investigations as well as non-statutory public consultations.

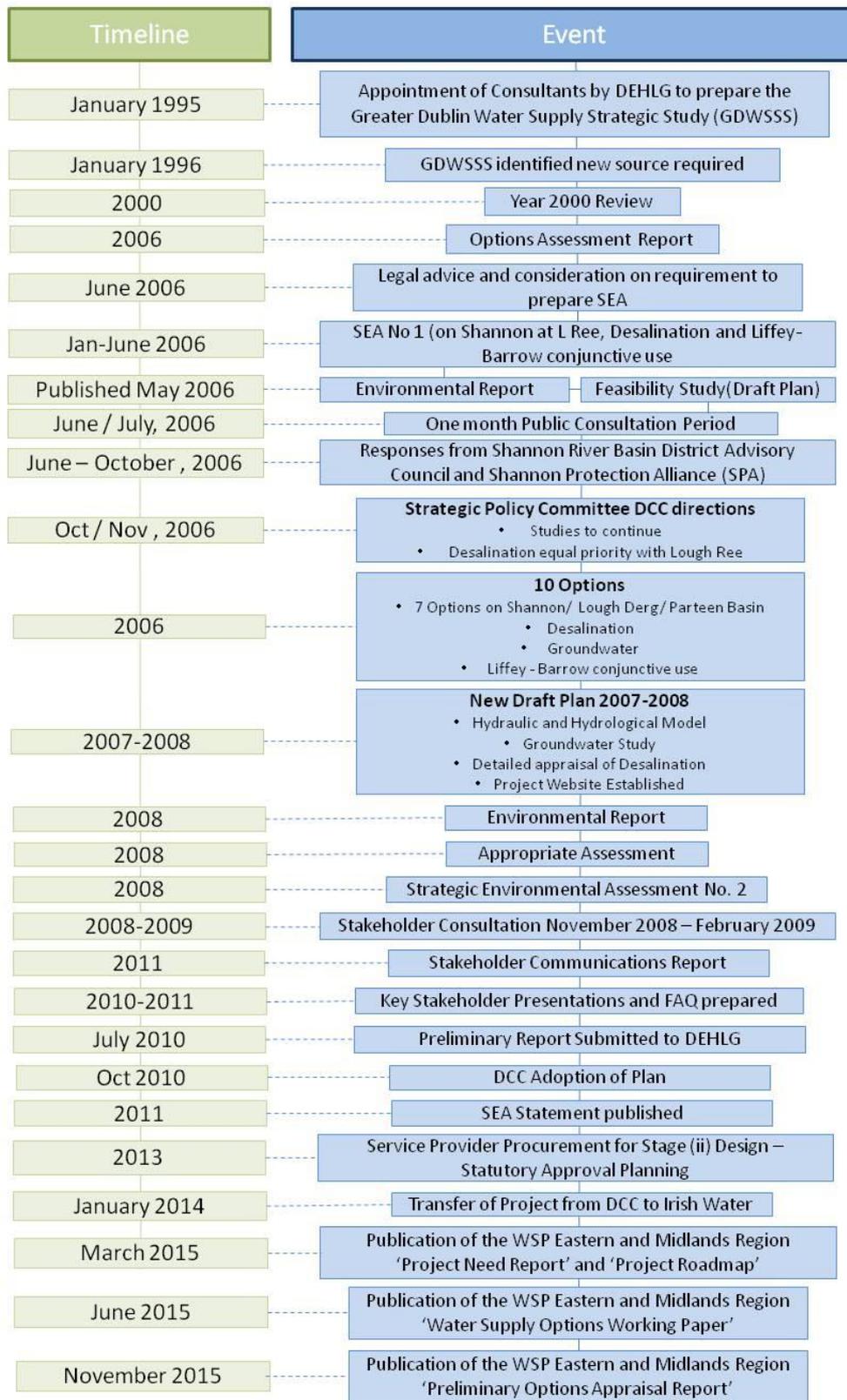


Figure 2-4 Chronological Development of the Project & Historical Datasets/Reporting

The reports detailed in Figure 2-4, and feedback from public consultation, form the starting baseline datasets for this current Stage 4 process.

Figure 2-4 includes the key deliverables that have taken place since the transfer of responsibility for managing the project from Dublin City Council to Irish Water; namely the *Project Need Report*⁵ in March 2015, *Options Working Paper* in June 2015, and the *Preliminary Options Appraisal Report* in November 2015.

2.4 Project Need Report and Project Road Map (Road Map Stage 1)

On assuming responsibility at January 1st 2014 for the WSP, which in essence is a nationally strategic water supply project, Irish Water commissioned a review of the fundamental determinants of 'Need' for the project. The *Project Need Report* examined:

- a) A range of demographic scenarios, to a planning year of 2050, for Ireland as a whole, for the water supply area served by the existing water sources in the Dublin area, and for those areas likely to benefit from proximity to transfer pipelines from a new source;
- b) The fundamentals of every element of the projection of water demand, drawing on currently available data returns from domestic water metering, projecting industrial water requirements, and assuming ambitious targets on water conservation;
- c) An independent assessment by professional economists, of the strategic economic importance of secure, resilient water supplies in the Midlands and Eastern areas, for the life and health of people living there, and for the sectors of the economy that sustains their livelihoods; and
- d) The importance of resilient connectivity of water resources for the safety, security and reliability of water services.

The Water Services (No. 2) Act 2013 places a statutory obligation on Irish Water under Section 33 of that Act to prepare, and review periodically, a Water Services Strategic Plan (WSSP). Irish Water must state its objectives, and the means to achieve those objectives, for the coming 25 year period, including in relation to, *inter alia*:

1. Drinking water quality;
2. The prevention or abatement of risks to human health or the environment relating to the provision of water services;
3. The existing and projected demand for water services;
4. Existing and planned arrangements for the provision of water services by Irish Water;
5. Existing and reasonably foreseeable deficiencies in the provision of water services by Irish Water; and
6. Existing and planned water conservation measures.

Section 39 of the Act goes on to require the Commission for Energy Regulation, in the performance of its function as Economic Regulator, to have regard to the need to ensure, *inter alia*,

7. The conservation of water resources;
8. The continuity, safety, security, and sustainability of water services; and
9. That Irish Water can meet all reasonable demands for water both current and foreseeable.

The WSSP represents the Tier 1 Strategic Plan for Irish Water and was published in October 2015 following public consultation on a Draft WSSP and associated Strategic Environmental Assessment (SEA) Environmental Report (19th February to 17th April 2015). The WSP has been in development for almost two decades, and runs parallel to the articulation of Irish Water's WSSP obligations. The discipline of strategic planning, holding a national perspective, embodied in the WSSP, was nonetheless embraced in the review on the *Project Need Report*, and continues to inform the Project.

Conclusions and recommendations drawn from the *Project Need Report* included:

- i. The population of the Dublin Region Water Supply Area, projected based on realistic planning scenarios, will rise from 1.52m at the 2011 Census, to between 2.02m and 2.15m by 2050. The

⁵ The Project Need Report was dated February 2015 but its publication occurred in March 2015.

population of a Benefiting Corridor routed across the Midlands, would rise from 0.53m at 2011, to approximately 0.68m at 2050.

- ii. The existing water supply sources serving the Dublin Region Water Supply Area can currently supply 623 MI/d at full production capacity under stressed conditions, against current average day demand of 550 MI/d. With respect to water supply management, and best international practices, there is inadequate provision for 'buffering' demand peaks and system outages.
- iii. The provision of water to the Dublin Region Water Supply Area and Benefiting Corridor will involve all elements of water conservation, tackling water losses and provision of a new source of supply. The requirement is to both minimise water demand, and to diversify risk from over dependence on existing sources.
- iv. The independent review by Indecon Economists underlined the strategic importance of secure, high quality water supplies for the key exporting sectors of the Irish economy. IDA has also emphasized the importance of resilient water supplies, not only for new industry considering locating in Ireland, but also those already established here, and considering expansion. On demographic, economic and water demand projections, and on considerations of resilience of supply, a need for a new water supply source for the Water Supply Area was established.
- v. A New Source raw water requirement of 330 MI/d by the year 2050 was envisaged at March 2015 to be phased to provide 267 MI/d for an option serving the Eastern and Midlands Region by the year 2022.

The public consultation on 'Need', initiated by issuance of the *Project Need Report*, sought feedback on the work presented, and the conclusions/ recommendations drawn, for due consideration in the next stage.

The Project Road Map was published for consultation alongside the Project Need Report. The Project Road Map outlined how a preferred new supply option would be selected and the public consultation milestones involved in that process.

2.5 Water Supply Options Working Paper (Road Map Stage 2)

The *Water Supply Options Working Paper (OWP)* was the second consultative stage of the Project Road Map (Figure 2-3), and included consideration of the following:

- A review of previous work, consultation submissions and recommendations;
- Identification of changes to National / European Legislation and European Site Designations;
- Identification of other relevant changes or new information that had become available since the completion of the previous work reported in Figure 2-4;
- Incorporation of any legacy items that were raised as part of the earlier Strategic Environmental Assessment (SEA) public consultation process.
- Re-visitation, reassessment, and re-evaluation with updated assessment methodologies, of those water supply options identified previously and outlined in Figure 2-4 to determine:
 - Do those water supply options remain valid?
 - Do those water supply options require further investigation/study?
 - Are there any new water supply options available?
- Identification of the methodology and criteria on which water supply options will be assessed in identification of a Preferred Option.

The earlier SEA assessed ten (10) Options (including sub-options), and ranked the top four technically viable options as follows:

- i. Option F2 (Lough Derg with Raw Water Storage in the Midlands)
- ii. Option B (Lough Derg Direct)
- iii. Option C (Parteen Basin Reservoir Direct)

iv. Option H (Desalination)

As a consequence of this second consultative stage, it was affirmed that these top four technically viable options still remained appropriate, and were to be considered further (during the EIA & Planning Process).

The SEA had expressed a preference at the time for Option F2 (Lough Derg with Raw Water Storage in the Midlands). However, this was provisional and was qualified pending substantiation through additional investigative works. These investigative studies were identified as:

- a) Water quality modelling of Lough Derg and Parteen Basin Reservoir; and
- b) A full geophysical survey of the soil and bedrock conditions at Garryhinch.

The geophysical investigative studies have been completed in the case of Garryhinch, and the water quality studies are otherwise continuing as part of the WSP Project.

The *Water Supply Options Working Paper* concluded by identifying constraints, which were a range of limiting factors on site selection for infrastructure, and assessment criteria to be applied in further assessment of the identified top four technically viable options.

An initial selection of constraints was mapped, and defined a 'white space' within which project infrastructure would be sited, i.e. a 'space' of least constraints.

A further public consultative process was undertaken on the *Water Supply Options Working Paper*, which sought feedback on:

- The range of identified constraints – in order to establish whether additional relevant constraints should be given due consideration; and
- The proposed assessment criteria to be used in further appraisal of Options at the next stage.

That feedback in turn informed the Preliminary Options Appraisal Report.

2.6 Preliminary Options Appraisal Report (Road Map Stage 3)

The *Preliminary Options Appraisal Report* (POAR) was the third consultative stage of the Project Road Map as outlined in Figure 2-3, and it included:-

- A review, and consideration, of all the submissions received as part of the public consultation process on the *Water Supply Options Working Paper*;
- Identification of any other relevant changes or new information that became available since publication of the *Water Supply Options Working Paper*;
- A relative assessment of the top four technically viable options identified in the *Water Supply Options Working Paper*, on the basis of 'people related' and 'environment related' impacts. These impacts were considered under the following broad categories:
 - Biodiversity, Flora and Fauna
 - Fisheries
 - Water (including Water Framework Directive)
 - Air/Climatic Factors
 - Material Assets (Energy)
 - Sustainability
 - Cultural Heritage (including Architecture & Archaeology)
 - Landscape & Visual
 - Material Assets (Land use)

- Tourism
- Population
- Human Health
- Soils, Geology and Hydrogeology
- A relative assessment of the top 4 technically viable options identified on the basis of other 'technical' impacts such as:
 - Safety
 - Planning Policy
 - Engineering and Design
 - Capital and Operating Costs
 - Sustainability
 - Consideration of Risk.

The Preliminary Options Appraisal Report identified an Emerging Preferred Option from the top four (4) technically viable options identified in the *Water Supply Options Working Paper*, two of which were set aside in the appraisal process for environmental reasons.

2.7 Final Options Appraisal Report & Environmental Impact Statement Scoping (Road Map Stage 4)

The *Final Options Appraisal Report* (FOAR) summarises the defining characteristics of the two remaining options and the published basis of the preference for abstraction from the River Shannon at Parteen Basin.

It examines the feedback from public consultation which was carried out over the November 2015 - March 2016 period on the POAR, and it also defines the significant influence of all three prior consultation stages, on decision-making by Irish Water and on the design process.

An interim review of water demand from the PNR is presented, in the light of submissions and developments since it was estimated in late 2014, but keeping in mind that a full review will require the preliminary results of Census 2016, which will become available later in Q4 of 2016. The proposed phasing of infrastructure to meet the need reflects the expected time profile of the developing water demand, as well as the requirement for resilience⁶ and headroom⁷ in the system as a whole.

The abstraction of water for municipal water supply at Parteen Basin will be accompanied by an Agreement with ESB which will define how a very small reduction in the use of water for hydropower will counterbalance the water supply abstraction, and Section 6 of this Report describes how management of water levels on Lough Derg by the ESB will result in no change to the normal operating band of water level, and with no change to the compensation water flows to the Old River Shannon at Parteen Weir.

The costs and benefits of the two remaining options are then assessed, leading to identification of the Preferred Scheme, which is abstraction from the Lower Shannon at Parteen Basin.

The component parts of the Preferred Scheme are then described, including the site selection and component sizing processes for the raw water intake/pumping station, the Water Treatment Plant and treated water pumping station, the transfer pipeline and the Break Pressure Tank and Termination Point Reservoir.

In parallel with consultation on the Final Options Appraisal Report, Irish Water is also consulting on the scoping of the EIS and NIS to be prepared on the preferred scheme. This is further discussed under 'Next Steps' in Section 4.3.

⁶ Resilience of a water supply system is its capacity to maintain levels of service to customers even when availability of a source is disrupted.

⁷ Headroom is defined as the difference between the amount of water a utility has available for use and the volume of water it expects to introduce into its network to meet demand.

The Environmental Impact Statement (EIS) Scoping Report sets out the proposed scope of work and methods to be applied in the development of an EIS for the proposed Water Supply Project Eastern and Midlands Region (hereafter referred to as the proposed development). The purpose of the EIS Scoping Report is to initiate early engagement, with prescribed bodies, ahead of upcoming environmental baseline surveys, so as to inform the EIS. The FOAR confirms a final preferred scheme for which a planning application, with a supporting EIS will be submitted to An Bord Pleanála in Q4 of 2017.

2.8 Final Options Appraisal Report - Report Structure

The Report is structured as follows:

Section 1 – Executive Summary

Section 2 – This section (Introduction and Background)

Section 3 – Introduces and summarises the remaining Viable Options under consideration, and the basis for the emerging preference at POAR stage.

Section 4 – Introduces the submissions that were received as part of the Public Consultation process for the *Preliminary Options Appraisal Report*; it details the responses prepared, and it defines the influence the consultation to date has had on the project scope and design.

Section 5 – Describes an interim review of water demand pending publication of detailed Census 2016 results, and outlines the approach to phasing within the Preferred Scheme.

Section 6 – Sets out the approach to water abstraction, updates the modelling of its effects, and the approach to management of the abstraction alongside hydropower generation.

Section 7 – Provides the updated position on hydrodynamic modelling of the Lough Derg / Parteen Basin area.

Section 8 – Outlines the Economic Analysis of the two remaining viable options.

Section 9 – The two options are evaluated, and the Preferred Scheme is identified.

Section 10 – This section deals with the topic of Community Gain.

Section 11 – Discusses the components of the Preferred Scheme, from abstraction, through water treatment and pumping, to pipeline infrastructure, reservoir storage, and integration with the existing network.

Section 12 – Details the routing of the transfer pipeline, and the influences in determining the preferred corridor.

Section 13 – Contains the concluding statement;

Section 14 – Outlines the next preparatory steps in overall project development.

The Report is supported by a number of appendices (listed below) which provide the detailed information on the reviews/ assessments which were undertaken in support of the preparation of this FOAR.

- Appendix A Interim Midlands and GDA Water Resource Plan
- Appendix B Hydrodynamic and Water Quality Modelling Report
- Appendix C Cost Benefit Analysis of Water Supply Projects for the Eastern and Midlands Region
- Appendix D Review of Treatment Technology
- Appendix E Raw Water Abstraction Site Selection
- Appendix F Water Treatment Plant Site Selection
- Appendix G Break Pressure Tank Site Selection
- Appendix H Termination Point Reservoir Site Selection
- Appendix I Transmission Pipeline Route Corridor Selection
- Appendix J Preliminary Options Appraisal Report – Consultation Submissions Report