UISCE ÉIREANN : IRISH WATER

Water Supply Project

Eastern and Midlands Region

Final Options Appraisal Report (FOAR)

Non Technical Summary

November 2016

Contents

Background

The Water Supply Project – Eastern and Midlands Region (WSP) has been in development since the mid 1990s, originally under Dublin City Council as project sponsor, and under Irish Water management since January 2014.

Three public consultations have already taken place since March 2015, first on the Need for the project and the road map for how the project would be undertaken, then on examination of Options and the method of appraising them, and thirdly, at November 2015, narrowing down the options, which were originally ten, to two for further examination, namely:

1. Abstraction from the Shannon at Parteen, and

2. Desalination of seawater from the Irish Sea.

This Final Options Appraisal Report (FOAR), identifies the Preferred Scheme as abstraction from the River Shannon at Parteen, downstream of Lough Derg. The process of reaching this recommendation is now offered for public consultation over 14 weeks, commencing on November 8th 2016.

The feedback on this consultation will be included as part of the preparation of the design, the Environmental Impact Statement and the Planning Application which will be submitted towards the end of 2017 to An Bord Pleanála for their independent adjudication. At that point An Bord Pleanála will undertake all necessary statutory consultations. In October 2015, Irish Water also published its Water Services Strategic Plan (WSSP), which sets out strategic objectives for the delivery of water services throughout the country over the next 25 years up to 2040. The WSP is closely aligned with key objectives of the WSSP and, since it serves more than 40% of the population of the State, it is an important component in the delivery of the overall strategic plan.

The question of 'Need' relates not just to providing additional water to meet growing demand, but also to providing increased robustness, or resilience, in the overall water supply system, against loss of supply, or contamination/pollution events, or risks arising from climate change.

The research work and public consultation over the past two years has concluded that existing supply sources and infrastructure for the region, do not have the capacity or resilience to meet future requirements. Population and industrial growth will generate a demand for an additional 330 million litres of water per day by 2050 (which is the equivalent of 130 Olympic sized swimming pools). The present infrastructure is struggling to meet current need as evidenced by a number of significant and costly outages in Dublin over the past 5 years.

Public consultation has consistently emphasized the importance of water conservation and of reducing leakage, which is a national problem, and which is too high. Section 5 of the FOAR outlines significant progress made by Irish Water, over the past 12 months, working with customers to reduce leakage. The water demand projections for the WSP already include ambitious targets for leakage reduction, and assume that these targets will be met. However, while fixing leaks and water conservation initiatives will provide valuable water savings, on which we are already relying to help to meet demand, this will not provide a long term solution for our water supply requirements.

The WSP represents the first major comprehensive upgrade to Ireland's 'new source' infrastructure in over 60 years. It is a key element of Irish Water's overall nationwide remit as it will meet the domestic, commercial and industrial needs of over 40% of Ireland's population into the medium to long-term future (to 2050).

Assessing Potential Sources

The four Options

Over the past two years, four technically viable options have been assessed, and refined down to two. The four options consisted of abstraction from North Eastern Lough Derg, with and without Midlands raw water storage, abstraction downstream of Lough Derg at Parteen Basin, and desalination of seawater in North Fingal. The four were validated from an original list of 10 possible options, examined previously during the 2008 – 2010 period.

The four technically viable options were examined in the Preliminary Options Appraisal Report (Nov 2015), and refined down to two remaining options, under assessment criteria which included:-

Environmental factors:

- Biodiversity, Flora and Fauna
- Fisheries
- Water
- Air/Climatic Factors
- Material Assets (Energy)
- Cultural Heritage (including Architecture and Archaeology)
- Landscape and Visual
- Material Assets (Land Use)
- Tourism
- Population
- Human Health
- Soils, Geology and Hydrogeology

Technical and Risk factors:

- Safety
- Planning Policy
- Engineering and Design
- Capital and Operating Costs
- Sustainability
- Risk (including technical, environmental, planning, financial and socioeconomic)

The assessments found that the two North East Lough Derg options had a significantly greater potential to impact negatively on the Shannon system (from an environmental perspective) than the Parteen Basin option which also has the potential to provide more widespread benefits along the pipeline corridor.

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.

The Preliminary Options Appraisal Report (Nov 2015) identified abstraction from the River Shannon at Parteen Basin (Lower Lake), with water treatment located nearby, as the Emerging Preferred Option, with Desalination of seawater as a less preferred alternative option. It also identified a pipeline route corridor which would be likely to have least environmental impacts. Public consultation on the Preliminary Options Appraisal Report took place from November 2015 to February 2016.

Feedback from that consultation process, results from continuing surveys, modelling and investigations, as well as assessment of the two remaining options using the constraints and assessment criteria, has lead to the formal identification of the Parteen Basin scheme as the Preferred Option. Details of the processes which led to this finding are set out in the Final Options Appraisal Report and its Appendices.

Further details on the background and implementation of the assessment process were set out in the Preliminary Options Appraisal Report.

Moving from Two Alternative Options to One Preferred Option

The two alternative options which have been under consideration are:

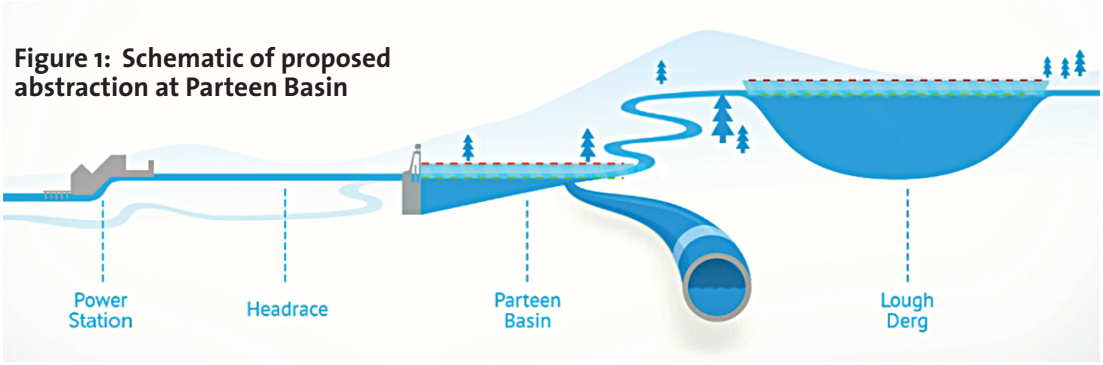
1) Abstraction from the Shannon at Parteen Basin (Lower Lake)

This option involves abstraction at Parteen Basin (Lower Lake), downstream of Lough Derg, followed by water treatment nearby at Birdhill. Treated water would be pumped to a high point near the Tipperary-Offaly border, from where it would flow by gravity to a termination reservoir at Peamount in south Dublin. Overall there would be 170km of transfer pipelines, crossing the country in a way that can deliver, at selected locations, resilient supplies of treated water to other communities along the route from Parteen Basin to Dublin.

Water volumes abstracted at Parteen Basin would be counterbalanced by an equal volume reduction in water used for power generation at Ardnacrusha, so that no change would be required in normal operating water levels on Lough Derg, or in minimum statutory flows required in the River Shannon

(In the Preliminary Options Appraisal Report published in November 2015, this had emerged as the option most likely to provide the best and most widely beneficial new source of supply for the Eastern and Midlands Region).

Figure 1: Schematic of proposed abstraction at Parteen Basin



2) Desalination

This option involves the abstraction of sea water from the Irish Sea in North Fingal and desalination of this water through a Reverse Osmosis (RO) desalination plant, together with the discharge of brine (from the treatment process) back into the Irish Sea. The process includes the pumping of treated water through approximately 35km of pipelines to existing and proposed reservoirs located in northern and western parts of Dublin.

Parteen Basin – The Preferred Option

While Desalination is technically viable it is significantly more expensive than the Parteen Scheme, which also offers greater benefits across a wider area in accordance with Irish Water's 25 year Water Services Strategic Plan (WSSP). Desalination would also be Dublin focussed, and would not address problems with existing, small and vulnerable Midland water supplies, which is an objective in Irish Water's WSSP. Desalination also posed a potentially greater environmental impact through its use of chemicals and high energy consumption.

Therefore abstraction of water from the Shannon at Parteen Basin (Lower Lake) has been identified as the option which best meets the objectives of the Water Services Strategic Plan because:-

- It has, by far, the least environmental impact of any of the Shannon options which have been under consideration. It is the closest location to the river estuary with all of the water having already flowed through the Shannon to Parteen. It carries least risk of environmental impact and the provision of water treatment at source prevents risk of transfer of potentially environmentally damaging alien species, such as Asian clams and zebra mussels, into other river catchments.
- The pipeline from Parteen has the potential to serve treated water to more locations, towns and communities along the route from Shannon to Dublin than any other option.
- Parteen Basin is already highly regulated because of the presence of the hydro-power plant, and water abstracted for supply will be counterbalanced by a corresponding reduction in water used in power generation. The proposed abstraction of water is, in essence, an abstraction of water from the hydro-power scheme. Abstraction of water from hydro-electric power schemes is commonly employed worldwide to enable environmentally sustainable availability of drinking water

Pipeline Route Corridor

Several 2km wide potential pipeline "corridors" were originally identified and assessed in the Preliminary Options Appraisal Report (POAR). One of these corridors was assessed as likely to have the least impact on communities and the environment, and this is termed 'least constrained'. This was offered for public consultation in the POAR, and is the corridor within which work has been continuing over the past year towards developing the final route for the pipeline.

Narrowing the corridor down to 200m.

Since February 2016, Irish Water's Landowner Liaison Officers have been contacting landowners to verify land ownership details and arrange permission for environmental surveys. Feedback from this consultation and the results of environmental surveys, has defined a preferred 200m pipeline corridor, within the original 2km 'least constrained route corridor', which again is positioned for least impact. This is shown as the purple line in Fig 2 below.

Within this preferred 200m pipeline corridor, the Final Options Appraisal Report and associated mapping also positions an indicative 50m pipeline corridor within which it would be feasible to locate the pipeline in way which accommodates environmental, technical and geographical constraints. This is still subject to consultation with those whose land the route will cross or pass near to and is also subject to some refinement with detailed design, which will continue to aim for the least impact on people and on the environment.

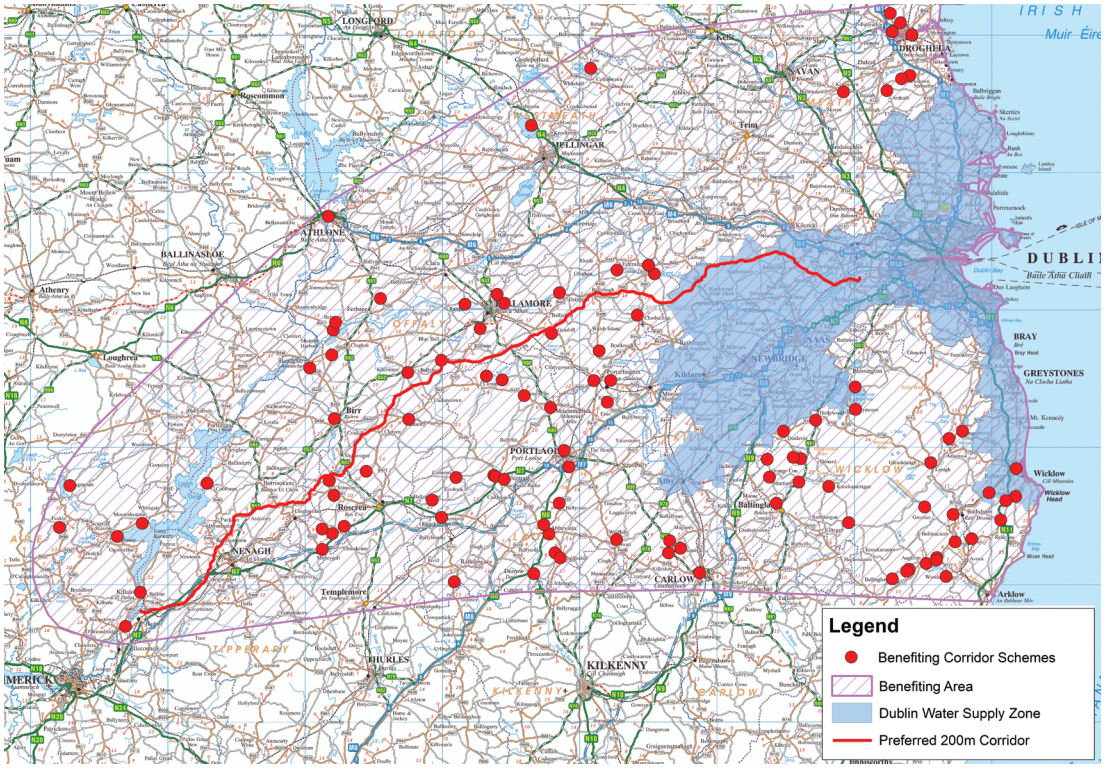


Figure 2: Proposed 200m pipeline corridor and existing water supplies in potential Benefiting Areas

Sustainable abstraction

Irish Water propose to enter an agreement with ESB, to reduce water used in hydropower generation at Ardnacrusha by approximately 2%, to offset the water to be abstracted from Parteen Basin for water supply. The abstraction would effectively come from water which is currently used in hydropower generation, and subsequently discharged to the tidal estuary. The water to be abstracted from Parteen Basin would require no change in the normal operating water level range in Lough Derg. Minimum statutory flow requirements on the River Shannon downstream of Parteen Basin would also remain unaffected.

Regional benefit

In the interim period since the Project Need Report of March 2015, Irish Water has reviewed the water supplies in a potentially Benefitting Corridor around the treatment plant and transfer pipeline.

Ireland has over 850 water treatment plants, serving 4.6m people, compared to less than 50 in Northern Ireland, serving 1.8m people, and 297 in Scotland, serving 5.2m people. Many of these water treatment plants and supply schemes, throughout the country, operate in effective isolation, with little supporting connectivity which would maintain supplies around disruption of a source, or treatment plant, or key section of trunk main. Our dispersed, isolated sources and treatment plants are a legacy of planning at 'county level' and with the formation of Irish Water an opportunity exists for consolidation to achieve consistently high standards and benefits of scale which are now needed. The low yield of many small Midland sources, their vulnerability to pollution, the environmental impacts of over-abstraction even under present conditions, are all operational facts and the consistent trend internationally is toward consolidation of such supplies.

Irish Water aims to consolidate existing smaller water sources of unreliable yield, or elevated vulnerability to pollution, or low linkage and resilience, to achieve nationally uniform standards of service from consolidated, efficient water treatment plants and resilient distribution systems. This is a clear objective in the 25 Year Water Services Strategic Plan. Consolidating that overall number, is key to providing consistent, reliable high quality water supplies to all citizens right across the Region.

At the time of preparation of the Project Need Report (March 2015), a preliminary estimate of the requirements of the Benefitting Corridor was prepared, based on individual county 'need assessments' prepared by Local Authorities, which predated Irish Water's assumption of responsibility for overall National Water Resource Planning. In the interim period since the Project Need Report of March 2015, Irish Water has reviewed the WSP need, based on detailed analysis and risk assessment of 107 existing water supply schemes, based on the 25-year rationalisation objectives of the Water Services Strategic Plan, whilst accounting for necessary upgrade works which have had to proceed in advance of the WSP, due to pressing water quality issues at some locations, particularly those in the EPAs Remedial Action List (RAL).

The review has also considered risk factors such as changing water abstraction legislation, source contamination, possible transfer of group water supplies and climate change.

Community Gain

Irish Water originally set out its approach to Community Gain in Section 10 of the Preliminary Options Appraisal Report (Nov 2015). It identified the potential for a significant element of community gain for those living and working in the Eastern and Midlands Region.

In addition to improved and sustainable domestic and commercial water supplies, the communities along the route of the pipeline are also in a position to gain some specific additional benefits.

Many products and services needed during construction will be sourced from local businesses; the construction phase of the project will provide a range of employment opportunities for local people; Irish Water, working with Local Authorities and other relevant bodies, propose to provide financial support for training schemes to enable as many local people as possible to work on the project. Irish Water also propose to support projects that contribute towards achieving the conservation objectives of the Lower Shannon Special Area of Conservation(SAC) and the objectives of the River Basin Management Plans (RBMPs), and the development of environmental education and protection initiatives and sports and leisure facilities. To this end, Irish Water in its Planning Application, will request An Bord Pleanála to include a community gain fund as a planning condition in any planning permission for the project.

Of the two remaining water supply options examined in the Final Options Appraisal Report, the Preferred Option (Parteen Basin) has the potential to give rise to the greatest breadth and variety of community gain as its 170km pipeline (See Figure 2) crosses several counties on-route between the Shannon and Dublin. The Desalination Option benefits a much smaller area, and it does not address the need to consolidate existing water supplies across the Midlands and Eastern Region, in accordance with the objectives of the Water Services Strategic Plan.

More detailed information on community gain can be found in Section 10 of the Final Options Appraisal Report.

The importance of action

The Final Options Appraisal Report recommends that abstraction from the River Shannon at Parteen Basin is, subject to public consultation and any necessary further research, taken forward to a Planning Application for the following reasons:-

i. The population of the Dublin Water Supply Area, on realistic planning scenarios, will rise from 1.52m people at 2011, to 2.15m by 2050. The population of the potential Benefiting Corridor around a treated water pipeline, routed across the Midlands, would rise from 0.53m at 2011, to approximately 0.68m by 2050.

ii. The principal water abstraction and treatment centres on the River Liffey, at Leixlip and Ballymore Eustace, have been developed over decades on infrastructure originally provided in the 1940s and 1960s and, in the case of the Vartry Reservoir, on infrastructure dating from the 19th century. The Water Supply Project represents the first major comprehensive upgrade to Ireland's 'new source' infrastructure in over 60 years.

iii. The existing water supply sources serving the Dublin Water Supply Area can currently supply 600-623 Mld at full production capacity under stressed conditions, against current average day demand of 550-575 Mld. When international norms of provision for peaks, and headroom are applied, the short term position, without proper planning, is one of increasing difficulty for reliably meeting water requirements. Action is therefore required to provide normal international water utility standards of service.

iv. In the East and Midlands Region, Irish Water, working with customers, has already saved 26 Mld in domestic leakage over the past twelve months. The calculated water requirement for the Water Supply Area and Benefiting Corridor already assumes that ambitious leakage recovery targets will be met (both on the customer side and on the mains network). However, the reduction of leakage alone will not meet the overall need. The requirement is to both minimise water demand and to diversify risk from over dependence on existing sources.

v. The original Project Need Report, which included an independent review by Indecon Economists has underlined the strategic importance of secure, high quality water supplies for the key exporting sectors of the Irish economy. It has examined the costs to the economy of water supply disruption and the negative impacts of supply systems which fall short of international norms of resilience and reliability. Indecon have highlighted the "very significant negative employment impacts if adequate water supply is not available to meet the needs of indigenous and overseas businesses". IDA have also emphasised the importance of resilient water supplies, not only for new industry considering locating in Ireland, but also for those already established here and considering expansion.

vi. Water demand projections have been independently developed, by Indecon and by the Project Engineering Advisers, in conjunction with Irish Water. Most recent available data from the metering programme on domestic consumption has been used, econometric modelling of industrial water requirements across each sector of the economy has been used and international trends in industrial water usage have been identified and included in projections.

vii. 'Do Minimum' options in the absence of the WSP project are likely to be expensive, disruptive and piecemeal in nature without decisively addressing the risks in the absence of a new Water Supply Scheme.

viii. Options have been assessed with the support of environmental and geotechnical surveys. A preferred option of abstraction of 330 Mld from the River Shannon at Parteen has been identified. This is sustainable and will be supported by an Agreement under statute to be negotiated with ESB which will reduce water usage in hydropower generation, measure for measure, with water abstracted for water supply.

ix. Irish Water, in looking at the water requirements from a new source, has taken a national perspective and is examining the contribution of a new source to the resilience of the collective sources serving the Eastern and Midlands areas of Ireland. It is expected that, over time, more than 100 public water supplies in the region, dependent upon small vulnerable sources, will be consolidated to less than 30% of this number, supported by the Water Supply Project. This is accordingly a nationally strategic project.

Moving to a Planning Application

At each of the three previous stages of the process of identifying a preferred option, public participation in the decision making process has taken place, and the views of all interested parties are again invited on the findings of the Final Options Appraisal Report (FOAR), and also on the scoping of environmental impact assessment work from this point onwards.

Public Consultation

A fourteen week public consultation process follows the publication of the FOAR. During this period, Irish Water is also consulting on the Scope of an Environmental Impact Statement (EIS) on the Preferred Option of abstraction from the Shannon at Parteen. This process is open to everyone, and the terms of reference for the FOAR and EIS Scoping Report public consultation are:

- Is there any additional information that should be considered in the development of the Preferred Scheme?

- Are there any additional environmental issues or alternative methodologies that should be taken into consideration in preparing the EIS?

- How would you like Irish Water to communicate with you as the project progresses towards planning approval?

Irish Water also welcome all relevant submissions on the project. The closing date for receipt of submissions is 14 February 2017.

The feedback on this consultation will be included as part of the preparation of the design, the Environmental Impact Statement and Planning Application which will be submitted towards the end of 2017 to An Bord Pleanála for their independent adjudication. At that point An Bord Pleanála will undertake all necessary statutory consultations.

For further information, questions or to make a submission you can visit: www.watersupplyproject.ie or contact us on 1890 252 848 watersupply@water.ie or by post by post to Water Supply Project, Merrion House, Merrion Road, Dublin 4.

There will also be a series of Public Open Days in the study area which will be advertised on local radio and press. More detail on these events are available on the website.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