

Public Consultation of the draft Regional Water Resource Plan – East and Midlands

Questions and Answers from Public Webinars

Introduction

This document is a record of both questions raised (during or shortly afterwards), and answers given at public webinars that Irish Water held in relation to the National Water Resources Plan: Regional Water Resources Plan-Eastern and Midlands (RWRP-EM) from the 2nd of February to the 23rd of February. This document is being provided in the interests of transparency, and to assist stakeholders with preparing their submissions on the draft RWRP-EM, which are due by 14 March 2022.

The questions and answers are set out in as verbatim a way as possible. We believe we have captured them accurately, although the webinars were not recorded. The answers given here are as given at the webinars and, where we have more information, we have added that in as well. This document also sets out questions submitted in writing by email following the webinars. Irish Water has grouped these questions into broad themes for ease of reference but has not edited the questions themselves.

A small number of questions were determined to be out of scope of the consultation process that Irish Water (IW) is currently undertaking. If a question submitted is not on the list below, IW confirms that the question was considered to be out of scope.

In some cases, the responses will provide references to sections of the draft RWRP-EM or the Framework Plan, which can be downloaded from the following websites:

RWRP-EM and appendices - <https://www.water.ie/projects/strategic-plans/national-water-resources/rwrp/eastern-midlands/>

Framework Plan and appendices - <https://www.water.ie/projects/strategic-plans/national-water-resources/>

In relation to submissions to date, Irish Water received 83 submissions on the Framework Plan. So far on the current consultation on the draft RWRP-EM, we have received 21 submissions, with the closing date for submissions being 14 March 2022. We anticipate receiving a significant number of submissions on the draft RWRP-EM. We believe it would benefit the draft RWRP-EM to receive as many submissions as possible.

RWRP:EM – General

1. This Report is based on population and economic data/forecasts from before COVID. This is clearly inappropriate given the demographic changes expected in the aftermath of the Pandemic. Covid is likely to have the largest impact on Irish demographics for many decades. Surely this context needs to be taken into account until the implications of Covid are clear, rather than justifying the biggest infrastructural project in the history of Ireland on the basis of outdated data that is highly likely to be wrong.

The base year used by Irish Water in the development of its NWRP is 2019, as 2018 was a significant drought year, and a National Water Conservation Order was issued for much of the summer period. Similarly, in 2020, restrictions related to Covid-19 may have altered the baseline demand figures for that year. Long term impacts of Covid-19 on demand will need to be assessed over the coming years before significantly altering forecasts. Irish Water therefore remains of the view that it is appropriate to use 2019 as the base year.

Irish Water will review trends in domestic and non-domestic demand over the coming years and assess the impacts of Covid-19 as per our monitoring and feedback process in section 8.3.8 of the Framework Plan. One of the benefits of a more interconnected water supply network will be the flexibility to adapt to changing growth patterns.

2. You said 88 sources are struggling; is that Midlands area or nationwide?

This figure refers to 88 supplies in the Eastern Midlands region, which are not currently reaching our optimum Level of Service (see section 3.2.1.2 of the draft RWRP-EM for further information on Level of Service).

3. Will the new plan serve areas which have historically not been served by a public supply? (i.e. businesses/houses on private supplies)

The draft RWRP-EM addresses existing public water supplies; however, IW recognises that there are some individual households, or group water schemes that would like to be taken in charge onto the public network. IW has a process for connection applications that is managed through our Connections and Developer Services team. Pre-connection enquiries can be submitted at <https://www.water.ie/connections/pre-connections/>.

Further information about group schemes is available from the National Federation of Group Water Schemes (NFGWS), advice and contact details can be found on their website <https://nfgws.ie/>

4. When will the transformation of the rest of Ireland be looked at?

We are out for consultation on the draft RWRP-EM until 14 March. Irish Water will then review submissions and consider where changes should be made to the draft RWRP-EM in response. Irish Water will also complete the environmental assessments required in respect of the plan, which will also be informed by public consultation. It may take 3 to 4 months after that until the plan is adopted.

Irish Water intends to issue the draft Regional Water Resources Plans for the three remaining regions (South West, North West and South East) for public consultation later this year. We anticipate that all four Regional Water Resources Plans will be finalised and adopted by early 2023.

5. There are significant excavation works planned in the coming years for inner city Dublin and the greater Dublin area to facilitate the retirement, removal and replacement of the Fluid filled transmission and distribution network cables (>100km of cables in this area). This work will require huge excavation works and would be an obvious opportunity to repair the current water system and enhance it with new pipe work for improved capacity and integrity.

Irish Water facilitates and aligns with delivery of other works, including local authority projects, when possible. An example would be the recent cycle path between Clontarf and the city centre. IW coordinated with Dublin City Council to complete the replacement of approximately 6 kilometres of watermains as part of development of the cycleway.

IW also has a working group with Bus Connects, to understand where there will be works coming up and whether IW works can be aligned. Irish Water sees these projects as an opportunity to reduce impact to our customers and the wider public while obtaining value for money in mains rehabilitation investment. However, this approach is not always feasible due to budget constraints and the need to address priority supplies. To give an idea of scale, there are 9,000km of water mains in the Greater Dublin Area (GDA). The current programme of mains replacement in that area includes 40% of the funding available nationally for leakage reductions. Irish Water prioritises mains replacement in the areas of greatest need i.e. lengths of mains with the highest historical burst frequency.

Significant works were undertaken during the lockdown period at times when it was possible to do so in compliance with government guidelines on COVID. COVID restrictions did result in periods of time where construction works were not allowed, and this coupled with altered working practices to limit the spread of COVID within our operation crews did limit the volume of work which could be completed.

6. Why are Irish Water not campaigning to users to conserve water?
7. We cannot look at any aspect of the natural world as separate. This plan seems to be doing exactly that. If an overall broader vision was adopted into IW plans, then the public would be experiencing an ongoing, all-out, robust campaign to conserve water and reduce water wastage. Then this Plan may be very different. Statutory bodies seldom go to the source of the problem.

"Use Less" is one of the three "pillars" that Irish Water has used to develop options to address identified need. Under the 'Use Less' pillar, conservation activities are underway at present, and Irish Water is committed to helping our customers become more efficient in their water use. Presently Irish Water is actively promoting water conservation in schools, business and communities through activities including:

- National and Local Media Campaigns;
- Targeted Sectoral campaigns;
- Green Schools;
- Water Stewardship Scheme;
- First Fix Free Scheme; and
- Development of an online water conservation application which will provide tips on how to conserve water in the home.

Irish Water also works with stakeholders to support policy change, such as developing water efficiency standards in Building Regulations and social housing.

8. Are you also engaging with farmers? What do they think of this plan?

Yes, we do engage with farmers and farming organisations. IW is committed to engaging with as many people as possible on the NWRP. We welcome input and feedback from farmers.

9. How have IW accounted for the growth of Limerick, Clare and Tipperary county population expansion over time and its associated water requirements?

As set out in Section 2 of the draft RWRP-EM, a key objective of the RWRP-EM is to ensure water infrastructure can support the proposed growth policies at national, regional and county level. Growth projections used within our draft RWRP-EM were based on best available data from the National Planning Framework (NPF) and Regional Spatial Economic Strategies (RSES's) at the time of compiling our draft RWRP-EM. The growth rates in the NPF for the key towns of Limerick, Nenagh and Ennis by 2040 are 61%, 30% and 30% respectively.

10. With regard to international best practice, what elements of the plan reflect learnings from other countries who have done something similar?

The Methodology in the Framework Plan aligned with the approach applied in the UK (England and Wales) due to the similarities between the legislative framework for water services, catchment level populations, water asset bases and water supply asset bases, while recognising existing constraints such as data limitations. However, Ireland is relatively unique in the European context, with the fragmented nature of its water supply due to the way in which Ireland's water supplies were developed historically. Therefore, the plan for Ireland has to be bespoke for the Irish context. There are 134 water supplies in the Eastern and Midlands region. A more interconnected network allows for more flexibility and a more secure water supply for the region.

The similarities and differences between our resources plan and those used in other jurisdictions and the reasons for those difference are included in Section 2 of the Framework Plan.

11. Which government organisation will be enforcing the new regulations regarding un-licensed abstractions in catchments? Will it be IW?

As outlined at Section 3.7.2 of the Framework Plan, the Government is currently developing new legislation dealing with water abstractions. Under this legislation, the Environmental Protection Agency (EPA) will be the licensing authority and the intention is that the local authority will be in charge of regulating sub-threshold abstractions.

RWRP:EM – Project Costs and Timelines

12. Can you give any estimate on cost of pipeline? Construction and annual running costs for the time period in question?

At plan level an outline design and estimated cost is developed for each feasible option, which captures the scale of the project and allows for a comparison of costs between other feasible options. At this stage, designs, costings and environmental assessments are desk-based and considered at plan level. As preferred approaches progress to project level, we conduct more detailed costings and cost benefit analysis. These are to meet the requirements of the Department of Public Expenditure and Reform and our regulator, the CRU.

13. How do you propose to finance it with competing demands, for example housing?

Irish Water is funded through central government and submits business plans to the CRU for both operating and capital costs for our revenue controls periods, which typically cover 5 year periods. The outputs from NWRP will be used in future submissions for funding. It is envisaged that it will take several funding cycles to deliver all works required, so the proposed works will need to be prioritised over future funding cycles.

14. The 60s and 70s saw massive growth in midland towns such as Mullingar. At the time Westmeath County Council chose to abstract water from Lough Owel, which had previously been the main feeder supply of the Royal Canal. The canal was closed at that time however the council gave an undertaking to provide an alternative supply should the canal ever reopen. We are now 12 years beyond the canal reopening yet no supply has been provided. IW have inherited this obligation to resupply. We believe the Shannon abstraction plan will eventually supply Mullingar which will then free up the Lough Owel supply for the canal. What is the timeframe for completion of this proposed pipeline. In recent years the restricted supply given to the canal from the Lough Owel feeder has resulted in the canal being closed to navigation for much of the year.
15. Again, re abstraction from Lough Owel... what is the timeframe for completion of the Shannon Abstraction Plan?

The proposed preferred approach for the Mullingar area, as set out in the draft RWRP-EM is to provide supply to the area from a connection to the pipeline transferring supply from the New Shannon Source to the Dublin area. The transfer pipeline is an inflight project and will have to go through its own statutory consenting process before works can commence, therefore we don't have a definite timeline for the completion of these works.

Irish Water is committed to providing an alternative source of water for Mullingar however, in the meantime we will continue to work with Waterways Ireland to safe-guard water supply to the Mullingar area.

RWRP:EM – Calculations, leakage, volumes

16. Given the sheer size/length of the new water mains planned, how will they be protected to prevent leakage? And what is the cost benefit of such a large project versus increased attempts at reducing leakage and waste?

Within the regional plan, it is proposed to construct an additional 800km of trunk main. This is in the context of 19,000km of existing main in the region at present. Therefore, it is a small percentage increase overall.

The proposed new mains are trunk mains with very few connections off them; they interconnect one area to another; therefore, they are usually high flow mains and less susceptible to leakage. Where leaks occur, they are easily found and repaired.

The consultation ongoing at present is on the draft RWRP-EM and not a specific project. Major projects identified in the draft RWRP EM will all be subject to a cost benefit analysis.

17. What is your target 2034 leakage (in Mld) for the GDA?
18. Surely you know what your 2034 leakage target is (in Mld) for the GDA? This is a key (and basic) piece of data that is fundamental in terms of allowing scrutiny.

Irish Water is working towards reducing leakage in the Greater Dublin Area (GDA) from 215 MI/d in 2019 to 131 MI/d by the end of 2033, which is the current target for the GDA applied within the draft RWRP-EM. This target represents 21% of projected demand at that time. This is a net reduction of 84MI/day between 2019 and 2033.

Although it is a 25-year plan, IW has adopted these targets up to 2033. As we approach 2033, we will again review the leakage targets. We anticipate leakage reducing to 21% in the Dublin Area and across supplies with demand greater than 1,500m³/day by then. This will reduce leakage levels across the entire region to an average of 22%.

Whilst carrying out our sensitivity analysis for the Plan, we reviewed the potential of achieving further leakage targets in the GDA and applied an additional 65ML/d of leakage savings (over and above the current target net reduction of 84 MI/day). This combined reduction would result in a leakage level of less than 10%. Our sensitivity analysis, set out in Appendix 9 of the draft RWRP-EM, showed that the preferred approach identified in the RWRP-EM is adaptable to further leakage reductions, including a leakage level of 10%.

19. Are there specific areas with an extremely high leakage rate?

IW is committed to addressing the current level of leakage across our supplies. In 2018, the rate of leakage nationally was 46%; by the end of 2020 it was 40%. By the end of 2021, we had reduced leakage further to 38%.

As part of the preferred approach for the Eastern and Midlands region, we are proposing to reduce leakage to 21% of total demand across supplies, with demand greater than 1.5MI/day. This equates to a total leakage reduction of 141MI/day across the region, which will bring average demand to 22%.

Leakage reduction will always be intrinsic to our resources planning process and will always be funded as part of each investment plan. We have a multitude of issues to address across our water supplies. We must transform our water supplies (abstractions, treatment plants),

improve interconnectivity between supplies by upgrading our treated water storage and trunk main network, as well as continue leakage reduction.

20. The consultation document states that (outside the GDA) you will only assume 3Mld of leakage savings between 2019 and 2034. Are you suggesting that this amounts to reducing leakage across the entire region (as your slide a moment ago suggests) to 21%?
21. You have shown a slide tonight that suggests this plan involves cutting leakage to 21% across the entire region. However, tucked away within this 1,000 page document, it is made clear that this is NOT actually the case. For the vast majority of water resource zones the SDBs assume that leakage will not be cut to anywhere close to 21%. Indeed, for multiple areas, the plan is not to cut leakage at all. How can you justify using such a misleading slide?
22. My question about leakage (your 21%/22% claim) was not answered. Your own document states that you do not reflect the full SELL reductions in your SDB. Across the entire region (ex-the GDA) - instead, you are only reflecting a reduction of 3Mld into your SDB. How do you justify this, given your claim to reduce to 22% across the region?

Leakage outside of the GDA is prioritised on an annual basis as part of the National Leakage Reduction programme therefore leakage targets are not automatically applied to the supply demand balance calculations. This allows Irish Water's leakage reduction programmes to be flexible and targeted, to meet specific emerging needs.

However as set out in Section 4.3.3 of the Framework Plan leakage targets for 2019 were applied to priority supplies based on: supply demand deficit, existing abstractions with sustainability issues, and drought impacts. For supplies within the Eastern and Midlands region, leakage targets of 3 MI/d were included in the supply demand balance for 2019 and it was noted that leakage targets for further years would be allocated to supplies to meet specific emerging needs. This does not mean that only 3MI/d will be applied for the region between 2019 and 2034 but rather we committed to a figure for 2019 in the supply demand balance and provided flexibility in where leakage reduction would occur after that.

The draft RWRP-EM provides more details of our current leakage targets for the Eastern and Midlands region, which are to reduce leakage in supplies with demand greater than 1.5MI/day to 21% of total demand by 2033. Supplies of greater than 1.5MI/day are found in various locations around the Eastern and Midlands Region.

This along with the proposed leakage reduction for the Greater Dublin Area (GDA), of 84MI/d, equates to a total leakage reduction of 141MI/day, which will reduce leakage to 22% of demand across the entire region. Therefore, the leakage targets outside of the GDA will equate to approximately 57MI/d by 2033. Our leakage targets will be reviewed annually and will be subject to further modification.

At project level, when we proceed to develop the preferred approach, we will review the supply demand balance and subtract the target leakage reductions from the deficit at this stage. This ensures that the preferred approaches are not oversized, or that the needs are over emphasized.

23. You state (in the draft RWRP - EM) that if you were to reduce leakage across just the larger non-GDA WRZs in the region to 22% then the long-term regional deficit would be reduced by 57Mld. What would be the additional impact (i.e. the further reduction

in the deficit, in Mld, beyond 57Mld) if all non-GDA WRZs in the region were reduced to 22% (i.e. not just the larger ones)?

As set out in the draft RWRP–EM our current leakage targets for the Eastern and Midlands region, are to reduce leakage in supplies with demand greater than 1.5Ml/day to 21% of total demand by 2033. This equates to a total leakage reduction of 141Ml/day across the region, which will reduce leakage to 22% of demand across the region.

The volume of leakage across supplies with demand less than 1.5Ml/day is less than 6% of leakage across the entire region therefore larger gains can be achieved by focusing our leakage reduction resources on larger supplies. As we approach 2033, we will again review the leakage targets and look to determine supplies that we should focus for further leakage reduction with the objective of achieving the best return for our investment.

24. Here is an example of a concern that was flagged in the last consultation process: concerns were raised in relation to your introduction of a 22-hour output concept. Your consultation report did not even attempt to justify/explain this concept (which is NOT international best practice) - yet you went ahead and used it in your final plan. Do you consider this to be transparent?

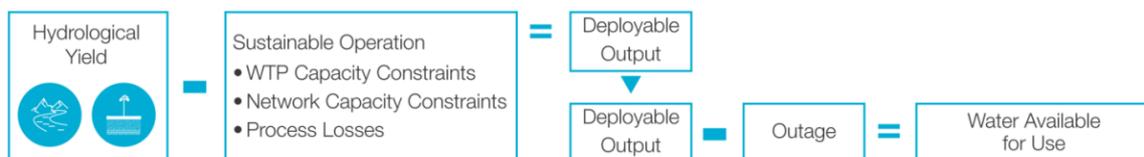
IW's treatment plants operate on a 24-hour basis. When we state 20-hour production in Normal Year Annual Average, we are referring to the rate of throughput of a water treatment plant, i.e. the flowrate through the plant is 20 hours/24 hours and this is what we refer to as the sustainable plant production level. The purpose of this is to optimise the sizing of the mechanical features of the water treatment plant, in much the same way as a car (with a car design, although the speedometer gives a range of speeds, the engine design is optimised for a given rev count. Although the car is perfectly capable of operating outside of the optimal rev count, there are impacts on fuel consumption and design life if this is continuously the case.). In our standard designs we optimise around a throughput of 20/24 hours in normal conditions, however in peak events we allow the water treatment plants to operate above this range. This ensures that we do not oversize the water treatment plants by giving consideration of the range of throughputs.

The purpose of allowing peaking to go above the sustainable plant production level is to ensure that deficits, during peak demand scenarios, are not exacerbated by water treatment plant capacity.

25. Is the demand Vs supply balance outlined based on actual gross system capacity, or net capacity (after system losses; leaks etc.)

In our calculations of the supply demand balance, we allowed for factors such as outage allowance, headroom and peaking factors. The graphics below provide an overview of how we determined supply and demand.

How we calculate Water Available for Use



How we calculate Demand



More detailed information can be found in Chapters 3 and 4 of the Framework Plan.

26. What percentage of the water supply for Dublin currently is industry/data centre usage versus residential usage?

Of the total accounted for water in the Dublin area, 60% was estimated as domestic demand (207MI/d) versus 40% non-domestic Demand (139MI/d) in 2019. These figures were provided in Section 4 of the Framework Plan.

27. Will the announced embargo on new data centre planning applications, the energy strategy for data centres to be built near renewables sources (west coast) and the decentralisation of industrial load centres significantly reduce the forecast water usage for the greater Dublin area in coming years? This coupled with the pandemic led shift away from cities for people and recent work from home legislation is a significant shift. I.e. is 330million litres a day still relevant?

To put water use from data centres in context, water usage nationally for data centres is less than 0.2% of overall total demand and, due to the use of advanced technology in this area, we don't envisage this level of demand significantly increasing.

Also, we already have strategies in place to mitigate demand from data centres, such as limiting peak flows to the development and ensuring the developer provides adequate private storage to manage needs during periods of peak demand.

Irish Water will review trends in domestic and non-domestic demand over the coming years and assess the impacts of Covid-19 as per our monitoring and feedback process in section 8.3.8 of the Framework Plan. One of the benefits of a more interconnected water supply network will be the flexibility to adapt to changing growth patterns.

28. To follow up on data centres though - they add significant usage at peak times when supply is low. The data centre in Ennis as planned uses significant water and water storage is for a single day.

Methods we use to reduce demand from large individual water users such as data centres includes limiting peak flows to developments and ensuring the developer provides adequate storage to manage needs during periods of peak demand.

29. What is the current supply capacity with leaks and what would it be with existing infrastructure if the leak rate was brought back to 5%?

Our estimation of water available for use does not include leakage. Leakage is considered in our estimation of demand. See response to Question 25 above. A summary of the water available for use across our supplies is set out in Section 3.2.2 of the draft RWRP-EM.

Whilst carrying out our sensitivity analysis for the draft RWRP-EM, we reviewed the potential of achieving further leakage targets across all of our supplies. For the Dublin area, we considered the impact of applying an additional 65ML/d of leakage savings (over and above the current target net reduction of 84ML/day). This combined reduction would result in a leakage level of less than 10%. Our sensitivity analysis, set out in Appendix 9 of the draft

RWRP-EM, showed that the preferred approach identified in the RWRP-EM is adaptable to further leakage reductions, including a leakage level of 10%.

5% leakage would not be feasible across the 65,000 kms of distribution network in Ireland, crossing both urban and rural parts of the country. Ireland, unlike the remainder of Europe, operates in a low-pressure system, which means that leaks are hard to identify.

30. Irish Water changed the definition of “leakage” in 2019. This is very significant for this project: consistent data is vital in order to assess the validity (or invalidity) of earlier demand projections. For the GDA for 2019, how many Mld that were previously recorded as “leakage” were recorded instead as (a) “non-domestic demand”, (b) “domestic demand” and (c) in your new category of “unrecorded use”?
31. In 2019 Irish Water significantly narrowed its definition of "unaccounted for water", by excluding many hitherto *included* elements of water loss. It carved out:
 - (i) water taken illegally/used by the fire services (which used to be reported within UFW and is now reported as "unrecorded use" - this amounts to 1% of DI)
 - (ii) meter under-recording (this used to fall within UFW but Irish Water has now increased the water categorised as "domestic demand" by 2% and increased the water categorised as "non-domestic demand" by 5% - and it has *deducted* the equivalent figure from 2019 UFW)
 - (iii) water used by Irish Water itself at treatment plants (this used to fall within UFW but, since 2019, a figure representing this volume of water has been added to "non-domestic demand" and has been *deducted* from UFW).

Unaccounted for water (UFW) is the difference between the quantity of water supplied to a network and the metered or understood quantity of water used by customers. Leakage is the volume of water lost from our networks during transmission from our water treatment plants to our customers.

The overall Irish Water methodology for how leakage is calculated has not changed since 2018. We are moving from estimating UFW to estimating Leakage based on the International Water Association (IWA) Water Balance Approach. This best practice methodology uses data from over 1.1 million meters on the Irish Network to calculate each element of the water balance including leakage and water delivered to customers.

The primary difference in moving our water balance and leakage calculation to the Leakage Management System is the use of actual domestic meter data to provide more accurate consumption figures for the domestic section of the water balance. Previously this element of the water balance would have been estimated using Per Capita Consumption (PCC) figures, thus the current leakage reporting is a more accurate number. We will have to do future work in improving our non-domestic metering and this is already underway.

32. You recently slashed the amount you spend on mains replacement to just EUR 34million a year (for 2020-2024). This is a tiny fraction of the expected cost of the Shannon pipeline project (EUR1.5billion and rising). You know that the pipes are the public’s main concern and until you fix them, no matter how much water you pump from the River Shannon, you will not fix Dublin’s problems. How can you justify spending such a tiny proportion of your budget on mains replacement?
33. You claim to have looked at all viable options – but a major mains replacement programme was NOT considered. This was raised as a concern during your last consultation (a year ago) – in response you claimed that your existing 0.3% per year

mains replacement plan already constitutes a major mains replacement programme. This is not valid. 0.3% is not a “major” mains replacement programme - at that rate some pipes will not be touched for another 330 years. Indeed, UKWIR research shows that 1.2% a year is needed just to offset the natural deterioration of the pipes. How can you justify your response in the last consultation process?

34. You have avoided answering our question: we are talking specifically about a major mains replacement programme as an option for the GDA water supply and your claim in the last consultation process that 0.3% per year constitutes a “major mains replacement programme”. How can you justify your response in the last consultation process? Do you genuinely believe that 0.3% is a major mains replacement programme?

In order to tackle leakage, the existing networks have to first be analysed using a combination of methods to understand the network and the causes of leakage. That is the first step in tackling leakage strategically.

In the initial years of our National Leakage Reduction Programme, we concentrated 60% of our expenditure on pressure management (to prevent future leaks), as well as active leakage control and ‘Find and Fix’ measures. These methods achieve the best outcome in terms of leakage reduction, which is then supplemented by mains replacement.

IW has a national programme of leakage reduction and is increasing the spend on leakage reduction measures over the coming years. Our investment in this area started at €100 million per year and is currently at €120 million per year. IW plans to increase this expenditure to €150 million per year in our next investment plan. We have also applied for further funding for leakage reduction measures as part of the National Development Plan. Currently 40% of our leakage reduction investment is spent on mains replacement and this annual spend will increase as the budget increases. That rate will increase over time as our funding increases and our knowledge of the areas we need to target increases. Our expenditure in terms of leakage reduction is approved by the CRU.

More generally, wholesale mains replacement is not recommended as a stand-alone solution. As set out in the European Commission’s EU Reference document ‘Good Practices on Leakage Management (Water Framework Directive Common Implementation Strategy Working Group Programme of Measures Case Study)’, there are no records of countries or jurisdictions that use largescale watermains replacement programmes as a stand-alone method to reduce leakage (even those with low leakage levels).

35. In our submission to your last “consultation” a year ago we flagged that “peaking” was being inappropriately applied to “total demand” which INCLUDED headroom. This inappropriately inflates the “headroom” provision. The CRU also raised a concern about this. Your response avoided addressing the concern head-on and simply stated: “Headroom is applied to total demand” – but this contradicts your own report which repeatedly made clear that “headroom” is PART OF “total demand”. The (opaque) data in your SDB also supports the case that “peaking” was indeed applied to “total demand” which included “headroom”. To clarify, please simply confirm: what was the 2044 “peaking” provision (in Mld) for the GDA for the DYCP?

Peaking is applied to the estimated Normal Year Annual Average Demand and the Normal Year Annual Average Demand includes a headroom allowance, which accounts for the uncertainty with data and the assumptions used in the supply and demand estimates and forecasts. The headroom allowance applied in the draft RWRP-EM for the GDA is 8%. Therefore, the estimated Normal Year Average Demand applied in the draft RWRP-EM for any given year is base demand plus 8%, and this represents the estimated normal year

average demand that we could be expected to provide supply for. It is critical that peaking is applied to the estimated average demand that IW could be expected to provide supply for. It is industry practice across all engineering projects to allow for uncertainties.

36. I explicitly requested the 2044 “peaking” provision for the GDA DYCP in Mld (not as a %). Yet again you are avoiding answering the question.
37. You have given a politician-style response that avoided answering our very specific question. I repeat our question: what was the 2044 “peaking” provision (in Mld) for the GDA for the DYCP? This is key data for the SDB that you should have available.

As set out in the Framework Plan the Normal Year Annual Average demand in the GDA for 2044 is estimated to be 683MI/d. The peaking factor for the GDA is estimated at 13.3% when the climate change factor has been applied, which equates to 91MI/d. Therefore, the Dry Year Critical Period demand is estimated to be 774MI/d.

38. What was 2020 average demand in the GDA?
39. What was 2020 non-domestic demand in the GDA?
40. What was 2020 domestic demand in the GDA?
41. What was (a) domestic demand and (b) non-domestic demand (each in Mld) for Dublin (the GDA) for each of 2020 and 2021?
42. 2020 GDA average demand is a very basic question that you clearly must know: please confirm it

Average demand in the GDA in 2020 was 571MI/d. In respect of accounted-for water, domestic demand was at 227 MI/d, with Non Domestic demand at 121 MI/d. The profile of the demand across the 2020 year was impacted by COVID restrictions, with an increase in domestic demand and drop in non-domestic demand.

In general terms, we saw a reduction in non-domestic use, but this was matched with a corresponding growth in domestic demand.

Due to the meter reading cycle the water balance for each year is determined after the first quarter of the following year. Therefore the 2021 figures are not available at this point in time.

43. What was 2020 “leakage” in the GDA (on a comparable basis to the 215Mld that you reported for 2019 in the WRMP)?
44. What was (a) average demand, (b) network leakage (each in Mld) for Dublin (the GDA) for each of 2020 and 2021?

Leakage in 2020 in the Dublin supply is estimated as 212MI/d. Due to the meter reading cycle the water balance for each year is determined after the first quarter of the following year. Therefore the 2021 figures are not available at this point in time.

45. Have you made a deduction for “deployment”/other infrastructure issues in calculating the WAFU for the GDA? If so, how much in total (in Mld)?

Water supply to the Greater Dublin Area (which includes parts of Kildare, Meath and Wicklow) is provided by a number of water sources and treatment plants that form part of an interconnected water resource zone. As this forms a complex network, the water available for use has been determined using a water resource planning tool known as Aquator. The

Aquator model enables us to assess the deployable output for the combined supplies for all weather conditions (normal, dry, drought and winter), for an appropriate level of service. The model demonstrates that the supply to the Dublin area in the dry year critical period providing a 1 in 50 level of service is limited by the raw water supplies. A 5% outage allowance has been applied to the yield estimated by the Aquator model to determine the water available for use. More details of the Aquator model and the outage allowance can be found in Section 3 of the Framework Plan.

46. You state that you provide for “climate change” on the supply side, but you do not confirm how big that provision is for the GDA. This is against the principle of transparency. What was the 2044 “climate change” provision (in Mld) for the GDA for the DYCP?

Climate Change factors were applied to the hydrological inflows to the Aquator model, which informs the volume of raw water available. As there are 3 impounding dams built into our model, we optimise the raw water storage (store water in winter for use in summer) to maximise the yield of water available.

Using the outputs from the Aquator model, it is estimated that the water available for use in the Dublin area will reduce by 16 Ml/d from 2019 to 2044 due to the impacts of climate change.

47. Please can you also confirm your target leakage level (in Mld) for the GDA for each 5 year interval from 2019 to 2044 (as factored in to your Supply Demand Balance for the GDA).

The leakage targets in the SDB provided in the Framework Plan and the draft RWRP-EM are set out in the table below.

	2019	2025	2030	2033	2035	2040	2044
Leakage (Ml/d)	214,829	178,829	148,829	130,829	130,829	130,829	130,829

48. What was your assumption level (in Mld) of baseline (2018) “customer side leakage” for your SDB for the GDA (note, we are talking about the GDA, not the “GDA Regional”)?

We don’t make assumptions on baseline leakage we have included private side leakage in the overall Per Capita Consumption (PCC) estimation.

49. Why have you spent taxpayers’ money on a THIRD report on non-domestic demand? You commissioned two equivalent reports in 2015 (one from Jacobs Tobin and one from Indecon). Now you have commissioned one from Ernst & Young. What was wrong with the two non-domestic demand reports you already had?
50. Why was it necessary to do a 3rd non-domestic demand report? You commissioned 2 equivalent reports in 2015 from Jacobs Tobin and one from Indecon. Now you have commissioned another from Ernst & Young. What was wrong with the two non-domestic demand reports you already had?

A key aspect of the NWRP is the monitoring and feedback process set out in section 8.3.8 of the Framework Plan. This process involves continual review of assumptions and data as new information becomes available, to ensure the NWRP is up to date. As it had been a number of years since the Indecon report was completed, a refresh was carried out using

more up to date data. The outcome did not show any significant change in forecast non-domestic demand.

51. What PCC do you use for the GDA (your report is not clear on this)

The Per Capita Consumption (PCC) for the Dublin area and other areas is provided in Section 4.2.2.2 of the Framework Plan. The following sentence is an extract from the Framework Plan:

“In our supply demand balance calculations, we use PCC calculated for the specific water resource zone based on the data we have. So, for example in the GDA we use 122 l/p/d, while in Cork City we use 143 l/p/d.”

RWRP:EM - Options Assessment

52. What will happen the people working in these 88 [SIC] (within the plan we note 66 plants will be decommissioned) plants when they are replaced?

53. The 66 plants that are being decommissioned. Where are all those people employed in those plants going to end up?

IW is presenting the draft RWRP-EM for consultation now; no final decisions have been taken in relation to any specific treatment plants. No plant will be decommissioned until there is an alternative supply available and operational. When finalised, the RWRP-EM will identify possible solutions, all of which will be subject to Irish Water's capital investment process, along with the appropriate regulatory and statutory consents. In addition, the RWRP-EM is a 25-year plan and it will take time and money to roll out all of the solutions identified within it. Not all plants will be decommissioned at the same time and it will be done on a phased basis.

54. Why isn't the Nenagh WTP connected to Limerick?

The Nenagh WTP abstracts water from Lough Derg. The WTP for Limerick abstracts water from the headrace to Ardnacrusha in the River Shannon. Both the Limerick and Nenagh WTPs are supplied by an extremely reliable raw water source, with appropriate water treatment and storage in place.

As the proposed New Shannon Source is in the immediate vicinity of Nenagh, there are options to connect up any large non-domestic users in the periphery of Nenagh from either the treatment plant at Coolbawn in Nenagh, or the proposed Birdhill WTP. This gives enormous flexibility in terms of growth and economic development to that area.

55. How does the 'virtual' connection secure supply to Limerick and Ennis?

The Limerick supply source is from the River Shannon, which is an extremely reliable water source. At present, there is existing connectivity between the Limerick and Clare supplies to the north of the River Shannon. The current preferred approach for Ennis in the draft RWRP-EM is abstraction from a highly productive aquifer at Drumcliffe. IW proposes to carry out further capacity checks on this groundwater body over the coming year. Further to the results of these capacity checks, there is an option within the plan to augment the Ennis supply from the Limerick regional supply if necessary.

56. Have you looked at abstractions from river sources that are also used for abstractions for canals? UK Tag on Flows. Obviously, we have WFD.

Some of our existing sites already abstract water from sources that are also used for abstractions for canals. These locations include Lough Owel in Mullingar, the River Barrow in Kildare and the River Liffey in Dublin.

All of our abstractions and the abstractions for the canals will be subject to new legislation on water abstraction, which is currently under development.

57. Is reverse osmosis of seawater, or large-scale rainwater harvesting an option for industry to reduce its demand?

Desalination is included as a feasible option within the draft RWRP-EM plan. As part of our ongoing water stewardship programme, we work with large non-domestic users in order to promote water efficiency, based on the best possible technologies that are suitable for use by their business.

Provision of independent supplies for non-domestic customers would require significant network development, for example, if we wanted to provide desalinated water, rainwater or treated effluent to non-domestic customers we would need to create an independent water network and ensure no cross contamination with the drinking water network. This would require a significant level of investment and disturbance to the general public.

We do work with large water users to reduce demand through our water stewardship programme and through our new connection programme we request non-domestic water users look to maximise the potential of rainwater harvesting and water recycling within their operations to reduce demand.

58. Considering our rainfall, why is water harvesting not a planning requirement for new houses for non-drinking water requirements in domestic settings?

Due to the seasonality of rainfall in Ireland, a significant amount of storage is required to ensure that rainwater harvesting is a viable option to address demand, particularly during dry periods. IW will progress pilot projects to assess the potential outcomes and benefits of rainwater harvesting over the coming years. Consideration must also be given to the operational and maintenance costs of such measures.

59. Ireland gets less water from wells (groundwater) than any other EU country. Over reliance on rivers makes us a complete outlier. Why is this not considered in the analysis?

Within each of the RWRPs, IW will consider potential groundwater sources for every water supply. All options considered were compared against each other using the options assessment methodology set out in Section 8 of the Framework Plan. As part of this assessment, the resilience of all options were considered and each option was given a score, which considers the potential impact of climate change. The storage capacity, sustainability and size and scale of the abstraction relative to the size and scale of the waterbody influenced this score.

Due to the natural geology of Ireland, largescale ground water storage is not available in all areas and in general groundwater is more applicable to smaller supplies in Ireland (80% of our small supplies are from GW sources). There are areas of gravel and karst aquifers with good productivity, and we are utilising these in Co. Laois, Roscommon and Ennis within the RWRP-EM.

However, we must also consider the environmental impact of groundwater abstractions. Some of the most productive aquifers in the EM region, such as the Curragh gravels, support sensitive groundwater dependent habitats, or others support baseflow into the rivers Barrow and Boyne. As a result, we give consideration the status of the water body, or neighbouring water bodies during our options assessment.

60. River water is generally dirtier, of poorer quality and more likely to be polluted than groundwater. It needs multiple levels of treatment to make it safe.

The purpose of the draft RWRP-EM is to look at all potential solutions across the region. It reviews every feasible option according to the methodology established in the Framework Plan. If there is good groundwater availability in an area, and it is environmentally sustainable, it will be reflected in the preferred approach.

As outlined above, the geology of Ireland means there is typically poor aquifer storage for large scale abstraction for public water supply, or there are environmental factors that preclude large scale groundwater abstraction.

61. How can you ensure that the rich biodiversity of the wetlands will not be impacted on negatively, given that everything in nature is interconnected and so finely tuned?

As part of our unconstrained options assessment, when we are reviewing options for ground water and surface water sources, we carry out desk-based assessments on the potential impacts on protected wetlands. This analysis is part of the Strategic Environmental Assessment (SEA) and Appropriate Assessment process applicable to the draft RWRP-EM. Environmental considerations including biodiversity are also reflected in the options assessment methodology set out in the Framework Plan. Where we consider there is the potential for an impact and if no mitigation measures can be found, we screen these types of options out.

For the options that remain, we must have a clear understanding of mitigation measures. As plan level approaches progress to project level, we carry out the required environmental assessments at a site level, including surveys and investigations, as part of the statutory consenting process.

62. In relation to the proposed changes to storage/abstraction inlet level at Poulaphouca, you state variously in your consultation document that this would result in 62Mld/70Mld/100Mld of additional water.

- (i) Why are three separate figures cited?

The potential interim solutions for the SA9 include increasing output at Leixlip WTP and Ballymore Eustace WTP. These works would be facilitated by optimisation of Storage at Poulaphouca by works to reduce the level of the abstraction inlet and/or by modifications to the storage curve. More details on these proposed interim solutions can be found in Section 6 of the Study Area 9 Appendix.

The figure in Table 7.20 of Section 7 of the draft RWRP-EM of 62 MI/d is a typographical error and will be corrected to be consistent with the Study Area Report which notes 70MI/d. We are proposing as an interim measure for the Dublin area to increase output at Ballymore Eustace WTP from 310MI/d to 380MI/d.

This temporary measure, along with a proposed increase in output from Lexilip WTP, by 50 MI/d will allow us to increase the volume of water we can provide to our customers. It is estimated that these works combined will provide us a total increase in the order of 100 MI/d, however the full yield we can obtain from the River Liffey will be determined in consultation with ESB, the EPA, IFI, Waterways Ireland and other impacted stakeholders.

Environmental assessments will be required before proceeding with any increase in abstraction and these assessments will determine the combined yield. The ability to increase output at Ballymore Eustace WTP and Lexilip WTP beyond the existing output is currently proposed to limit the risk of outages to our customers in the scenario where we have to reduce output at either plant due to an unplanned outage. Again, this proposal is a temporary or interim measure until we can develop and deliver the preferred approach, which will allow us to provide the 1 in 50 level of service to our customers.

- (ii) Does the volume of water available vary from the WCP to the DYCP?
(iii) How much additional water do you anticipate (in Mld) would be available during the DYCP?

Yes, the water available for use from the Liffey system varies from the WCP to the DYCP. The full yield we can obtain from the River Liffey will be determined in consultation with ESB, the EPA, IFI, Waterways Ireland and other impacted stakeholders.

Environmental assessments will be required before proceeding with any increase in abstraction and these assessments will determine the combined yield available. These works will not increase the DYCP yield for the 1 in 50 level of service, however, these works combined with leakage savings, will allow us to maintain the existing level of service in the normal year scenario while facilitating growth over the next ten years.

63. With Bord na Móna currently decommissioning many bogs, was the option of creating a vast midland reservoir to capture the winter excess of water which is currently flushed down the Shannon?

Such options were considered in the draft RWRP-EM, however, these options were considered unfeasible due to the fact that raw water transfers from sub-catchments significantly increase the risk of transfer of invasive species.

64. You have NOT published your overall groundwater assessment e.g. how you calculated yield etc. Are you still relying on the 2008 Eugene Daly report?

Our groundwater assessment methodology is set out in Chapter 3 of the Framework Plan and is also described in Appendix C. The assessments are carried out for every unconstrained groundwater option based on the best available data from the Geological Society of Ireland (GSI) and the EPA. The assessments are carried out by a team of expert hydrogeologists who are certified members of the International Association of Hydrogeology (IAH).

We are not relying exclusively on the 2008 Eugene Daly report as that was a high-level report completed for a specific reason and did not include for assessment of impact in terms of the Water Framework Directive, or the feasibility of abstraction from certain aquifer types.

65. Has IW looked to neighbouring large metropolitan cities? London requires 2.6 billion litres per day and Thames water supplies this with 70% reservoirs fed by the Thames and Lea rivers and the outstanding 30% from boreholes.

Currently water supply to the Dublin area is provided from a number of supplies including impounding reservoirs on the River Liffey, River Vartry and the River Dodder along with a run of river abstractions from the River Barrow, River Vartry and groundwater supplies from Kildare and North Dublin. IW's draft RWRP-EM considers similar approaches to other utility providers and looks to balance supply from different resilient sources.

66. Surely a similar approach using the local water sources (Liffey, Dodder etc.) would be more than sufficient? London has far hotter summer and less rainfall per year.

Within our draft RWRP-EM, we have considered additional abstractions from the River Liffey, the River Dodder and the River Barrow, as well as new abstractions from more local sources, from water bodies in the Wicklow area, however, while these sources may be suitable to supplement increased supply in the short term, the required yield is not available from these sources to provide the target level of service that we have set within the NWRP – Framework Plan. The target level of service is required to ensure continuity of supply to our customers in the area during drought periods.

RWRP:EM –Specific/Detailed Questions

67. Has an environmental impact study been carried out on the extraction of water from the Shannon and the construction of a pipeline to the east from the Shannon.
68. IW intend to abstract 3.5 cumecs from the Ardnacrusha headrace. Is there a statutory limit to the amount IW can abstract from there? Will it be monitored with respect to low water level in the lake - and the abstraction rate adjusted accordingly? How will this real-time monitoring of water level and associated abstractions be made available for the public?
69. How will IW ensure the 45 cumecs of flow will be supplied to fish passes to ensure fish migration around Ardnacrusha?
70. Lough Derg has fish species of conservation interest (Pollan and Lampreys) as defined in the SAC Site code 002241. Will the abstraction of water from the Parteen hatchery have mitigating measures (at the intake pipe end) to ensure that these internationally protected species populations will not be impacted by this massive abstraction project? Just to remind that Lough Derg has a uniquely land-locked lamprey species and a declining population of pollan.

The draft RWRP-EM assesses the abstraction of water from the Shannon and the construction of a pipeline to the east at a Plan level only. The draft RWRP-EM has been subject to Strategic Environmental Assessment and Appropriate Assessment. The draft RWRP-EM has applied the methodology, as adopted in the Framework Plan, and through that process has identified preferred approaches at water resource zone, study area and regional level.

As one of Irish Water's in-flight projects, environmental surveys have been undertaken in relation to the impacts of this abstraction. These environmental surveys include ecological, water quality, noise monitoring, traffic, agricultural and archaeological surveys. As with all projects identified in the draft RWRP EM, project specific, detailed environmental assessments will take place prior to any planning permission application being made and these questions will be addressed at this stage.

71. In your previous report in 2015 you published (in full) the reports that fed into your industrial demand projections, your desalination consideration, your per capita consumption assumptions, your groundwater analysis etc. This allowed genuine public scrutiny. Many errors were identified within your report. This time you have failed to publish most of the reports at all (and, in the case of non-domestic demand, published just a summary). This is against the public interest and the principal of transparency. How can you justify this?

The RWRP-EM is a regional water resources plan, where we are looking at needs and associated options to address all 134 water supplies within the region. To inform the development of the RWRP-RM, we produced a supply demand balance for each of those 134 water supplies within our Framework Plan.

During the consultation stage for the Framework Plan, it was noted that we had not published any updates to the non-domestic profile for the GDA region. On this basis and to ensure transparency, we included the updated report within Appendix 9 of the draft RWRP-EM. This report is a summary review and update of the original non-domestic projections for the region and it includes all variables for non-domestic demand, forecast and volumetric increases. However, it should be noted that there is no significant difference in relation to the outcome using the updated data.

As part of the development of the RWRPs, we have two hydrogeologists working in-house in the development of the feasible options and preferred approaches. These hydrogeologists use best available data and information from the GSI and the EPA in completing these assessments. As part of the options assessment process, groundwater use has been considered for every single supply.

72. Have you conducted a survey on the impact of abstracting 2% of water from the lower Shannon during periods of drought? I am involved with a rowing Club and we are very concerned.

The draft RWRP-EM has determined that the volume of water required is available from the new Shannon Source, as assessments have been undertaken to establish the allowable abstraction. This is an estimate of the water that can be taken from the source whilst maintaining the required environmental flow and it has followed the methodology set out in [Appendix C](#) of the NWRP Framework Plan. At project level, additional more detailed assessments will be carried out.

It should be noted that the River Shannon is the largest river in Ireland and its catchment covers 20% of the island of Ireland. It is a slow-moving water body with significant volumes of storage throughout the catchment due to the presence of lakes. This means that flood events last for long periods, however it also means the water body is less vulnerable to droughts as there is significant storage during dry weather events. It means it is a good source for water supply. The proposed abstraction is from an impounding reservoir / dam, which means you can store water when there's plenty of rain and during a drought period, the abstraction will be taken from this storage, without impacting on flows downstream of the dam.

73. Is there ecological analysis done with regard to impact of new pipeline in Study area 7, as it is an area of intensive animal-based agriculture

All options identified in the draft RWRP EM, including the construction elements, are subject to Strategic Environmental Assessment and Appropriate Assessment. As part of our options assessment process, environmental considerations represent 19 of the 33 total assessment criteria that are taken into account. The impacts of pipeline construction are factored into the environmental and social cost aspect of our feasible option's whole life costing. Further details on our assessment criteria can be found in Chapter 8 of the NWRP Framework Plan.

The draft RWRP sets out proposed preferred approaches, which will have to go through their own consenting process and for projects that included significant length of trunk main, this will include a route selection process.

74. Due to the erratic nature of climate change, how is it possible to predict or in any way determine accuracy in relation to abstraction from Shannon or even use the idea of sustainability as I understand it.

IW has carried out a lot of research with the Irish Climate Analysis and Research Units (ICARUS) Department in NUI, Maynooth, under the Climate sensitive catchments project. This project has used the latest climate change projections and a best practice risk-based approach to assess the impacts of climate change on flows in 206 catchments in Ireland. Full details of how climate change factors were considered are outlined in [Appendix F](#) of the Framework Plan.

Each Preferred Approach was assessed against adaptability under the following headings - Sustainability, Climate Change, Demand Growth and Leakage Targets. The details of this sensitivity analysis will be in each of the Study Area reports and the SEA. Further assessment of the impacts of climate change will be carried out at project level through hydrological modelling work. Refer to the details provided above regarding the River Shannon.

75. If you complete this project, 100% of Dublin's raw water will be surface water (the lowest quality river water of all). This is a huge risk for Dublin. How can you justify this.
76. 99% of Dublin water is category s3 river water. Dublin is a major outlier among other European capitals (many of which now get most/all of their water from wells which is much safer) this is a serious risk for Dublin (as the Leixlip debacle showed in 2019). Why did you not mention this in your document and what did you not prioritise it as a risk to address?

Other capital cities look for multiple sustainable water sources. Those sources can be either surface water, or ground water sources, once they are sustainable and resilient. The purpose of the draft RWRP-EM is to find options that are sustainable and resilient. IW's plan considers similar approaches and looks to balance supply from different resilient sources.

Currently water supply to the Dublin area is provided from a number of supplies, including impounding reservoir sources, groundwater sources and run of river sources. Raw water quality varies across all water supplies. While run of river sources are more vulnerable to pollution, we can also have issues with unacceptable levels of naturally occurring Iron and Manganese at our ground water sources.

All water supplied by the public water supply must comply with the Drinking Water Directive. IW takes a risk-based approach to our water supplies using the World Health Organisation's drinking water safety plan methodology. This ensures that our water treatment plants are designed based on the type of water abstracted from any given source and the treatment processes put in place are designed to remove all contaminants. All public water sources, including groundwater and surface water, involve water treatment.

77. Parteen basin is near the end of the river before it becomes tidal hence this will be the source for the abstraction for Dublin.
78. The Shannon water would be S3 water (i.e. the riskiest type of water) - do you agree?
79. Safe for human use. If you complete this project 100% of Dublin's raw water will be s3 water (the lowest quality river water of all) this is a huge risk for Dublin. How can you justify this?

The Parteen Basin is near the end of the Shannon catchment and this provides many benefits as the source is from an existing impounded reservoir which allows water from the catchment to be stored during the Winter for abstraction during the Summer. By virtue of the fact that this impounding reservoir is at the bottom of the catchment, a larger volume of water is available for abstraction from this location, and this source will be less vulnerable to drought.

Currently water supply to the Dublin area is provided from a number of supplies, including impounding reservoir sources, groundwater sources and run of river sources. Raw water quality varies across all water supplies. While run of river sources are more vulnerable to

pollution, we can also have issues with unacceptable levels of naturally occurring Iron and Manganese at our ground water sources.

All water supplied by the public water supply must comply with the Drinking Water Directive. IW takes a risk-based approach to our water supplies using the World Health Organisation's drinking water safety plan methodology. This ensures that our water treatment plants are designed based on the type of water abstracted from any given source and the treatment processes put in place are designed to remove all contaminants. All public water sources, including groundwater and surface water, involve water treatment.

80. The Shannon pipeline project has been going on for 25 years yet Irish water/dublin corporation have still not drilled a single borehole (test or otherwise) to investigate wells/groundwater for this project. You now say you will "work with" the GSi to better understand groundwater . Why has this not been done before? Groundwater is the most obvious solution yet you still say you don't know enough about it.
81. Dublin is the largest area of need you didn't answer my question as to why there has been no test boring Irish water is proceed as if the Shannon abstraction is a done deal which it is not at present

The draft RWRP-EM considered all feasible options to provide supply to the Dublin area, including the provision of groundwater supply. Unfortunately, due to the natural geology of Ireland, largescale ground water storage is not available in all areas and in general groundwater is more applicable to smaller supplies in Ireland (80% of our small supplies are from ground water sources).

While groundwater supplies were considered for the Dublin area, due to the limited yield available compared to the magnitude of need in the area, such solutions will need to be considered in combination with other solutions (i.e. desalination), to provide the required need within the area. When solutions for the area were considered using the methodology set out in the Framework Plan the provision of new groundwater supplies, were not determined as the proposed preferred approach for the area.

82. Hundreds of concerns that were raised in the public consultation on your previous document (a year ago) were entirely ignored and not addressed at all in your "consultation report"/reflected in the final (published) document. How can you claim that this is a transparent process? Is it not the case that you will justify the Shannon pipeline at all costs and regardless of any legitimate concerns and challenges? What is the point in a "consultation" that is simply window-dressing?

All submissions were analysed and assessed. The outcome of this assessment process fed into the development of our final plans. A detailed post Consultation Report which ran to 476 pages (214 pages plus Appendices) was published along with the updated plan, SEA Statement and AA Determination. Irish Water carried out a very thorough and comprehensive consultation process and responded substantively to submissions. The NWRP is not a vehicle for any individual project. It is a plan for every public water supply in Ireland.

83. You are adding in new regions. This pipeline project must not be pushed through on the basis of red herring " needs" if local solutions for those "needs" would obviate for this €1.5 billion project which will probably exceed budget

The draft RWRP-EM reviews options for supplies across different spatial scales, first locally at Water Resource Zone (WRZ) level, then at Study Area Level and finally at Regional Level (see Section 6 of the draft RWRP-EM). The preferred approach for the Greater Dublin Area at WRZ level is the development of a New Shannon Source, see Appendix 9 of the draft RWRP-EM and this is the case without it serving additional regions.

One of the benefits of the NWRP is that we can consider our supplies holistically and consider solutions that may benefit more than one supply. This aligns with other jurisdictions, for instance, Northern Ireland has only 7 Water Resource Zones in comparison to our 539.

In total, a connection to the new Shannon source was considered for 50 supplies but was only determined the preferred approach for 34 supplies. For each of these supplies, we considered all feasible options and compared these against each other across a range of criteria including: Resilience; Deliverability and Flexibility; Progressibility; Sustainability (Environmental and Social Impacts); and Cost. Through this process, the Preferred Approach for 34 supplies (including Dublin) was determined to obtain additional supply from the new Shannon source.

84. Irish water is now talking about Dublin being a "parent supply" (i.e. Taking water from the Shannon and passing it on to other regions) indeed you state that the preferred approach for Dublin (which it is now clear will have a much smaller projected deficit than you previously thought) "will need to be modified for this additional required demand". This sounds like the tail wagging the dog: the Shannon pipeline can no longer be justified on the basis of demand projections for Dublin alone – so

Within our plan, the preferred approach is an integrated supply across multiple water resource zones. Even at present, many of the supplies that serve Dublin are located outside of Dublin. With a more integrated supply network, our plan allows for more regional development and better regional access to resilient water supplies.

85. Considering the emphasis on renewable energy should not the esb keep its water supply to increase out from ardnacrusha rather than facilitate a 172 km pipeline through 500 farms of the best farmland of Ireland
86. Are the ESB being compensated for the loss of head of water from the pipeline abstraction at Parteen? Ireland is experiencing power shortages (Data Centres, Hospitals, Industry etc) from time to time. Will this loss of water head compromise the ESB generating capacity in times of peak demand for electricity?

Energy demand in Ireland has completely transformed since the development of the hydroelectric schemes in Ireland. For example, Ardnacrusha when developed provided nearly 100% of Ireland's energy needs, while it currently provides around 2% of total energy needs.

IW will enter into negotiations with ESB with regard to compensation for energy loss due to the proposed abstraction. The maximum volume of water required for supply is approximately 2% of the maximum flow that can be processed for energy supply at Ardnacrusha. Therefore, any potential reduction in energy supply will be negligible.