

THAMES WATER UTILITIES LIMITED
WATER RESOURCES MANAGEMENT PLAN

CLOSING SUBMISSIONS
ON BEHALF OF GARD

1. GARD is an organisation of largely local residents opposed to the building of the Upper Thames Reservoir (UTR), and as such the UTR is the focus of our submissions. However, we do not put our case on the simple basis of saying “not here”. It is GARD’s very strong view, having been closely involved in the evolution of the Water Resources Management Plan (WRMP) and in this Inquiry, that TW have palpably failed to show that the UTR is needed and have gone to considerable lengths to avoid properly assessing a number of alternatives many of which appear likely to meet whatever need exists in a cheaper, more sustainable and more efficient manner.
2. GARD therefore submits that the Secretary of State should require TW to properly assess need, but most importantly procure a thorough, independent and fully audited investigation of the alternative methods of meeting any “need” along the lines set out the end of Mr Lawson’s (JL) evidence.¹ We are very concerned that TW have a preordained agenda to build the UTR, for reasons that we will deal with later, and that unless required by the Secretary of State in the clearest possible terms, TW will ensure that in all future options appraisals the UTR will be selected by them.

¹ GARD/3.2, paras 9.3.1 to 9.3.3

3. These submissions will be structured as follows:
 - a. The legal approach under the Water Industry Act 1991;
 - b. The approach to the EA Guidance;
 - c. The analysis of demand in the revised draft WRMP (rdWRMP) focusing on
 - i. External use
 - ii. Population forecasts
 - d. Supply side options focusing on
 - i. Unsupported Severn Transfer
 - ii. Supported Severn Transfer
 - iii. Effluent reuse
 - iv. Oxford Canal Transfer.

LEGAL APPROACH

4. Mr Lindblom QC (KL) in opening made a number of submissions about the approach that the Secretary of State should take to her power under s.37B(7) Water Industry Act 1991 to direct TW to change the Plan. The first point to make is that the Secretary of State's power is unfettered, i.e. in deciding whether to require changes she does not have to apply any particular test and she is not restricted to express statutory considerations. Clearly she must direct the changes on grounds which are relevant to the issues raised in the Plan, but beyond that she has a wide discretion.
5. KL submitted that the Secretary of State should exercise this power "circumspectly"², but there is no statutory support for this submission; indeed, to take this approach would not accord with the words of the WIA. There is nothing in WIA which suggests that the Secretary of State should defer to TW's judgement as to the content of the Plan, or that she should apply some test of not interfering if the Plan "*is found to satisfy the essential requirements of lawfulness...*".³ As Defra's briefing to the Inspector makes clear, the matters upon which the Secretary of State wishes to receive advice include whether the Plan is fit for purpose and whether particular options should be removed and consequential changes made.⁴ That is consistent with the Secretary of State's powers to enforce the duty on TW "*to develop and maintain an efficient and economical system of water supply within its area*".⁵
6. At para 31 of the Opening KL tried to restrict the Secretary of State to what in legal terms would be called a Wednesbury review, i.e. the Secretary of State can only intervene in the Plan if she finds that TW has reached unreasonable judgements, rather than if she simply disagrees with those judgements. Again there is no support for this approach in the statute, and the words of s.37B are quite clear that the Secretary of State has an unfettered power to direct

² TW/101 para 12

³ TW/101 para 18.

⁴ CD5.5

⁵ WIA 1991, s 37

changes and she can do so on the basis that she disagrees with TW's conclusions on relevant issues.

7. At many points during the Inquiry KL has sought to emphasise that the Plan is TW's Plan, in an attempt to imply that the choices within the Plan are ones for TW. TW is the author of the Plan and they have the statutory duty to implement it, but that says nothing about the Secretary of State's power to direct changes. The Plan making process is one in which the Secretary of State has a critical role in protecting the public interest by ensuring that the Plan is fit for purpose.
8. Another issue of overall approach is that of the proposal by objectors of alternative material within the Plan. Particularly in his xx of Mr Dobson (MD), KL appeared to suggest that there was some onus on objectors to put forward alternative figures to those in the Plan which they argued were defective. This is not correct. If the Secretary of State concludes that there are parts of the Plan where the conclusions are not robust then she can either direct TW to make changes or to carry out further work and then make changes. It is not for objectors to do this work. There may be instances where it is possible for GARD to put forward specific alternative figures, e.g. external water use. But there are others such as population predictions, where the figures in the rdWRMP are not robust, but it is not possible for GARD to put forward alternative figures both because of the lack of robust evidence base and the complexity of the modelling.

THE EA GUIDANCE (CD4.8)

9. TW's approach to this Guidance is, at best, inconsistent. When it suits their case they insist it should be followed to the letter, but on the most important issue in this Inquiry, that of Sustainability Reductions (SR) they equally insist on their right to act wholly contrary to the Guidance.

10. The Guidance is a material consideration which should be accorded very great weight in the Secretary of State's decision making. Of course KL is right to say that it is not a statute, and the Guidance itself is non-statutory. However, in terms of weight to be attached it is guidance from the statutory Agency charged with securing the proper and efficient use of water resources in England and Wales; it is Guidance specifically on the production of draft WRMPs; it is wholly up to date (November 2008); and it was subject to consultation, including with water companies.

11. The Guidance is the statutory agency's balance between ensuring security of supply, which no party suggests is not a highly important matter, and an efficient and cost effective water supply. KL repeatedly said that water supply should not be a risk business, and doubtless he will emphasise in closing the huge damage if London were to run seriously low on water and emergency drought measures had to be introduced. He will at least imply that GARD is advocating a "risky" and "uncertain" approach. This is nonsense. The body to make those judgements as to the level of risk is the EA. The EA has considered the approach to issues around risk and robustness and the Guidance is the outcome of that consideration. It is important to remember that it is the EA which is the statutory body charged with securing the proper and efficient use of resources, and not TW. It is also important to bear in mind that the nature of water supply will always include some risk (weather patterns being inherently uncertain), and therefore a balance between risk of lack of water and oversupply with excessive cost will always have to be made.

12. There are very strong reasons why the Guidance should be followed unless there is an extremely good reason to depart from it. The Guidance ensures a

fair and consistent approach between water companies. If one company is allowed to depart from a fundamental part of the Guidance, e.g. the approach to SR, then that creates considerable potential unfairness between water companies and will inevitably lead to pressure from other companies to make similar departures. Quite apart from the danger of making poor decisions, such inconsistency creates the potential for TW to gain commercial advantage in circumstances where other companies are being told to abide by the Guidance.

13. In respect of the approach to SR the Guidance is entirely clear;⁶

“Water companies should only include definite changes in their final water resources management plans.”

It is not without significance that these words are in bold in the Guidance. Therefore TW are seeking to depart from the clearest and most emphatic guidance, given by the Secretary of State’s own statutory advisors.

14. KL xx of the EA witnesses (particularly Ms Smith) seemed to proceed upon the slightly bizarre lines that because the EA had not yet even provided indicative SR figures this was not dealt with in the Guidance, and that the Guidance did not specifically deal with what TW chose to call “long-term” risk. In GARD’s view this is nonsensical. Firstly, the Guidance specifically deals with SR, so whatever the position in respect of any other “long term risk” or uncertainty, that element of long term risk is expressly covered by the Guidance. Secondly, if indicative SRs are not to be included in the Plan because they are too uncertain, then it logically must follow that pre-indicative SRs cannot possibly be included. Any other view would be perverse.

15. The practical reasons for not including non-definite SRs in the Plan are overwhelming. The problem with anticipating the level of SRs is that it necessarily involves guessing at the level, and there is a high risk (if not very high risk) that the guess will be wrong, and the choices made upon it will be wrong. The facts of this case entirely bear out that concern.

⁶ CD4.8 p.6-4

16. This matter is critical for the inquiry, and particularly critical for GARD. Both Dr Lambert (CL) and Ms de Garis (YdG) in their evidence made abundantly clear that the UTR would not be justified in the Plan, if it were not for the inclusion of provision for SR. As CL stated “It is clear that a 100Mm3 [UTR] or equivalent transfer or re-use plant would not be required to simply service a deficit of 60MI/d”.⁷ The actual deficit – as opposed to that based on the inclusion of SRs – would require no major new strategic resource in the plan period (whether that resource be the UTR or not). GARD’s case at is simplest is that TW has simply taken speculative SRs to create a “need” for the UTR which does not exist. The EA agree with GARD in this respect.
17. There seemed to be some attempt by TW towards the end of the inquiry to suggest that this was only the case for the 100Mm3 UTR, and by implication that the 50Mm3 UTR might be justified even without the SR. But this is not the case as put in TW’s evidence, nor in the Plan itself.⁸ A smaller reservoir raises wholly different issues which would require further consideration and assessment.⁹
18. The choice of 100 MI/d as a SR to take into account in the Plan is manifestly unsafe for the following reasons. Firstly, the rdWRMP has a figure of 100MI/d for potential SR. This figure is not the product of any information provided by the EA; does not result from any analytical process documented at the time by TW; and could not be explained by CL other than being “what we think is affordable”. On no analysis can that form a rational basis for approving a Plan. It is quite extraordinary that TW are asking the Secretary of State to approve the Plan on the basis of a figure which has no evidential support.
19. Secondly, the figure of 100MI/d bears no relationship to the pre-indicative figures produced by the EA in the email dated 12 January 2009.¹⁰ These show

⁷ TWR/10 para 3.1.6. See also TWR/10 paras 2.0.4, 2.1.6 and 2.4.3 and TW/4-B paras 2.33, 7.4.6, 7.4.11, 7.5.8, 8.4.3 and 9.5.

⁸ CD1.6b, pp438-439

⁹ Including but not limited to the issues raised in GARD/2.2, 8.117 onwards.

¹⁰ TW/3-C, F20, p 113 and TW/4-C, p 16

that there might be a SR of between 0-600Ml/d on the Thames, with no probability analysis of where on the scale the actual figure is most likely to lie.

20. Thirdly, it is highly suspect that the figure of 100Ml/d neatly supports the construction of the UTR, at a point in the Plan making process where without the SR TW would not have been able to justify keeping the UTR in the Plan. Once the household demand figures were reduced from the draft Plan, then in truth any case for the UTR fell away. It was extremely fortuitous for TW that they then felt the need to insert provision for possible SR, that allowed them to retain the UTR in the Plan.
21. Fourthly, CL's justification for the 100Ml/d figure (rather than anything higher) was that this was what TW thought was "affordable". It is extremely difficult to understand how TW had reached this conclusion. It is not based on any analysis that CL could point to. It is very difficult to understand how the assertion can be correct when there is potential for supported Severn Thames Transfer (SST) options to provide a much higher deployable output at potentially a lower unit cost. Therefore there is clear potential for SRs of much more than 100Ml/d being "affordable".
22. Fifthly, TW's approach prejudices environmental decisions that have to be properly considered and evaluated, e.g. what is the relative benefit of SR on the Thames as against increased abstraction on the Severn; or the impact of raising the dam at Craig Goch to provide a much higher DO and therefore the potential for a high SR. These environmental balances cannot be undertaken until the EA has concluded its work on the Thames in order to understand the environmental benefits of SR.
23. If TW are allowed to pluck a figure out of the air and then use it to justify the UTR in the Plan then there is a real danger that the wrong choices will be made. This is wrong in the sense of wrong for the customers, who will pay over a very long period, and wrong for the environment at and around the UTR site which will be irreparably damaged. It may not be the "wrong" choice for TW in the sense that it would remain a highly profitable

investment. TW constantly emphasise the need to minimise “risk and uncertainty” but the risk and uncertainty around the 100MI/d figure is huge – the ultimate figure could be 0 or it could be much higher than 100MI/d, particularly if one takes into account the possibility of SR on the Lee as well as the Thames, where the non-indicative figure is in the region of 200MI/d.¹¹

24. GARD is extremely sceptical about the justification for the figure of 100MI/d for the River Thames. TW emphasise the need to minimise risk and stress their duties to customers. But TW is a commercial undertaking whose interest is their investors. It is the EA which is the guardian of the public interest in this field and they are entirely clear that non-definite SRs should not be included, and that the balance between adequate supply and demand should be as set out in the Guidance. TW are using the “minimisation of risk and uncertainty” to justify what is in fact their financial interest.

25. It is clear that there is and has been, considerable concern within the water industry as to a structural imbalance within the financial arrangements which favour large capital intensive infrastructure projects over other ways to meet needs (either demand reduction measures or more revenue intensive measures). It is important to appreciate that this is not a concern just raised by GARD; it is one that was also raised by Ofwat¹² and by the water companies themselves.¹³ Ofwat say that “...*there is a view that [the current financial framework] encourages the companies to invest excessively in capital assets like reservoirs*”.¹⁴ The Water UK document Meeting Future Challenges refers to the fact that “*at least in the long term the regulatory regime only allows companies to make profits by building assets*”¹⁵ and the benefits for a company in building such assets and then selling the water to other companies, i.e. precisely the situation TW wish to create here. Similarly, the EA express concern about the consequences of developing a large assets with additional

¹¹ TW/120 referring to CAMS Tier 1 Appraisal

¹² CD3.165

¹³ CD3.166

¹⁴ CD3.165, p 16

¹⁵ CD3.166, p 11

costs to consumers.¹⁶ KL's only answer to this in xx of Ms Smith was to say that Water UK was raising the issue rather than giving a definitive answer.

26. It is not for this inquiry to investigate the complexities of water financing, but it is noteworthy that when Miss Lieven QC asked Mr Aylard (RA) about the financial bias towards capital intensive projects he denied that this was still a problem¹⁷ and suggested that Ofwat had dealt with it. He failed to refer to either the Ofwat or Water UK documents, both of which make entirely clear that this remains an issue for the industry. Importantly, Meeting Future Challenges is a document produced by the water companies themselves in June 2010, thus showing that the financial bias towards the construction of large reservoirs over smaller demand reduction measures remains very much an issue for the industry.

27. The importance of this issue is that it provides at least part of the explanation as to why TW are so determined to build the UTR, rather than properly consider other options which could be both cheaper and less environmentally damaging.

Timing

28. TW's justification for including the 100MI/d SR is wholly and entirely that they say there is a risk that pursuant to the Water Framework Directive ("WFD") they may be required to meet SRs by the long-stop date of 2027, and that the only way to have certainty that they could meet such SR is by providing for the UTR in this Plan. They raise the spectre of the Commission of the EU ordering the UK Government to implement a measure which would leave London's water supply at critical risk. There are a whole series of reasons why this argument is wholly fallacious, and no more than a scare tactic.

¹⁶ EA/7, 5.6

¹⁷ NL's XX of RA

29. Firstly, it is totally inconceivable that the EU would take any steps which could require TW, or the EA, to jeopardise London's water supply. Even if the Commission thought that there was a sufficiently serious breach of the WFD to require any action to be taken, they will necessarily do so in an extremely careful manner and will not put at risk London's water supply.
30. Secondly, the EA is the authorised body with responsibility to Government (and through it to the EU) for the WFD. The EA has stated in completely clear and unequivocal terms that it will give water companies sufficient time to meet any SR. It is again inconceivable that the EA would go back on this commitment, but if they did TW would have an extremely strong (probably overwhelming) case of legitimate expectation that would bind the EA to their commitment, and could ultimately be enforced by the courts. The prospect of the EU overriding this is fanciful. The very odd situation arises in this inquiry whereby TW are arguing that if the UTR was not complete in 2027 then there would be a breach of duty under the WFD, but the statutory body with responsibility for the WFD says there would be no breach and no risk of infraction proceedings.
31. Thirdly, in any event, if the UTR is not in this Plan but there is a thorough and independent appraisal of options and it is decided – once the SRs are definite – to put it in the next Plan, there is more than adequate time to bring the UTR forward in time for 2027. YdG's timetable at table 2 is quite unreasonably extended, with 3 years for the draft WRMP and then 3 more years for the NPS¹⁸:
- a. If TW take the view that they want the UTR to be in the NPS before they make an application then they can request the Secretary of State to review the NPS pursuant to s. 6 Planning Act 2008. TW rely on the IPC Implementation Route Map¹⁹, which speaks of the WRMPs being in place before the NPS. However, this is plainly in relation to the production of the first NPS. It is neither guidance (nor law) that the

¹⁸ TWR/4B p.57

¹⁹ CD3.143

water NPS cannot be reviewed in the absence of a WRMP dealing with the specific point. The Secretary of State has a broad power to review under s. 6, and the circumstances of there being a potential shortfall in London's water supply because of the introduction of a SR in 2013/4 would plainly fall within the terms of s. 6;

- b. If TW took the view that there was a real urgency about proceeding once the SR became definite, and they felt that they could not wait for the NPS, or a WRMP, then they can under the 2008 Act make an application without an NPS. There is nothing in the 2008 Act which prohibits the grant of a DCO without an NPS or without mention in the relevant NPS of the particular proposal. Equally, they could “twin track” changes to the NPS and make an application and/or make the next WRMP at the same time;
- c. YdG's timetable has TW proceeding at an extraordinarily leisurely pace, with no application preparatory work until 2019, even though the SR is confirmed in 2013/4. Clearly the application preparatory work can be done at the same time as the review of the NPS;
- d. There are also potential time savings within the construction programme, which is 9 years between DCO consent and “water available”, e.g. water would actually be available even on TW's timetable 12 months earlier.

32. TW lay great weight on the need for consultation, which GARD entirely agrees with. However, that is no excuse to extend the process for as long as humanly possible. If TW carried out the appropriate studies into alternatives at the appropriate time, had them independently appraised (at all stages, including their terms of reference) and were then open about the information provided (i.e. the process they should have done this time), consultation does not have to lead to a process taking 20 years between the SR decision and the water in the reservoir.

33. Reverting to the position of the EU. On the assumption, which GARD wholly do not accept, that there is a thorough and independent conclusion that the UTR is needed and the best option, and the consent is granted before 2027 and TW have taken steps to start work, it is inconceivable that the EU would start infraction proceedings against the UK Government for not meeting the terms of the WFD. It would be politically inept and a total waste of time and money.
34. Finally, as MD pointed out, the IPC process was introduced to make infrastructure projects quicker, but TW's timetable seems to suggest that they have actually served to slow down the process, which is plainly incorrect.

Does it matter if the UTR goes into the Plan?

35. TW have repeatedly stated that they will make no financial commitment to the UTR until the next Plan period, it will then be subject to further review, and therefore there is no detriment if it goes into the Plan now.²⁰
36. In GARD's view this argument fails both in terms of principle and practice. In principle there is no justification for the UTR being in the Plan unless need for it can be established now. If in truth it is an option which needs to be considered if and only if SR of a particular level is determined, then at the most it should be a contingency alongside other contingencies such as Severn Thames Transfer and reuse - it should not be in the preferred options list. The fact that it may be reviewed in the future and may not be built does not change that fundamental proposition.
37. However the point goes much further than that. Because TW has no intention of making a financial commitment to the UTR in the next AMP, it strengthens the case to exclude it from the Plan given the points set out below in respect of the uncertainties on the demand side and the options on the supply side which require further investigation.

²⁰ See the references at FN7, above.

38. The evidence of this inquiry is that TW are strongly committed to the UTR, indeed have decided upon it, for reasons which seem to relate to their financial interest. TW have manifestly failed to properly and fairly assess other options and have sought in practice to ensure that other options will appear less favourable than the UTR. The most obvious examples of this are:

- a. the failure to carry out a trial of a conventional treatment process at Deephams, so ensuring that IPR schemes appear as much more expensive than the UTR;
- b. failing to assess the Severn Transfer schemes on the spurious basis that they required an appropriate assessment and therefore cannot be placed in the preferred options list;
- c. failing to carry out the investigations recommended by the NRA in 1994.

39. Once the UTR goes into the preferred programme, any onus on TW to properly and fairly appraise other options disappears. Momentum will build behind the UTR, with the enthusiastic support from TW, and it will become impossible to stop, however strongly the Secretary of State caveats her approval and whatever representations GARD and others make. Therefore even if the UTR can subsequently be seen not to be the best option environmentally, or in terms of meeting water need, it will become the scheme and will be built. The example of the Kielder Reservoir, although doubtless different on the facts, is a salutary lesson in the need for robustness with this kind of long term and very costly infrastructure, and the way that such schemes can become entrenched. The risk in this regard does not fall on TW but on the consumers of water who will have to pay for the UTR for many years to come, come what may.

40. TW rely on Ofwat's statutory powers to review and approve proposed expenditure. However, there can be very little doubt that if the outcome of this process is that the UTR remains in the preferred programme and the Secretary

of State finds that there is a need case for it at this stage, then Ofwat are extremely unlikely to revisit that issue. Ofwat will doubtless review the cost, and perhaps the scale, but the fundamental need case is being decided here.

DEMAND

41. There are a number of issues on the demand side of the analysis upon which GARD is unconvinced. GARD accepts that with such long term forecasting there will always be considerable elements of uncertainty. However, it is GARD's view that the demand analyses are consistently on the high side, and in particular that there are two elements where it can clearly be shown that TW's demand figures have been overstated.
42. The frailty of TW's demand predictions is shown by Table 1 in Mr Binnie's (CB) evidence²¹. Over the course of the last 5 years TW's demand predictions have fallen dramatically. CL gave a series of explanations for those changes, all of which are doubtless true, but what they show is that TW got its predictions dramatically wrong and there is no reason to believe that they have now become any more robust.
43. The two elements of the demand analysis which GARD believes to be so clearly flawed that they should not be allowed to stand without comment in the Plan are external water use and the population figures. We appreciate that these matters have been agreed with the EA and that will necessarily carry weight, but the figures are so grossly inflated that the EA's agreement should not be determinative.

External water use

44. CB on behalf of GARD accepted the current figures for external water use, but contested the growth figures. The rdPlan assumes growth of external water use per household over the Plan period for both measured and unmeasured households²². The primary driver for this growth is an assumed growth in the ownership of hosepipes and sprinklers of 0.5% pa. TW accept that the

²¹ CD2.2 p12

²² CD1.6b vol 3 app B p.53

evidence for this is “scant”²³, but can be traced back to A Scenario Approach to Water Demand Forecasting; Environment Agency.²⁴

45. It is useful to start by considering the factors within the London WRZ which strongly point to a relatively low level of external water use, and particularly low growth in such use:

- a. London has a high population density with a relatively high proportion of flats²⁵. The proportion of households that have no garden will therefore also be relatively high;
- b. As a consequence of the high densities, average garden size will itself be relatively small;
- c. Households with no garden or a very small garden are unlikely to have hosepipes or sprinklers;
- d. London has a relatively low level of car ownership²⁶, so the proportionate amount of car washing will be lower;
- e. Government policy, both nationally and for London is that densities should increase²⁷, thereby inevitably leading to more flats and fewer/smaller gardens.

46. The 0.5% growth figure for hosepipes and sprinklers is a national figure, rather than having any relationship to London and its particular characteristics. It can be traced back to the Bisgrove and Hadley Study²⁸, which itself relied on earlier work,²⁹ but that was for the South East and therefore heavily influenced by areas with far more extensive gardens than the London WRZ. Further the 0.5% in the EA report was the growth figure for a high economic

²³ GARD/2.2 para 5.25

²⁴ CD3.42

²⁵ GARD/4.4, App F

²⁶ GARD/4.4, App E

²⁷ GARD/4.4, App 1

²⁸ CD3.116

²⁹ CD3.116, p 81. The reference is to a report by Herrington P, *Climate Change and the Demand for Water*, EA/HMSO

growth scenario, whereas the more central growth figures were 0.25% and zero.³⁰

47. Therefore TW have taken a figure which is not appropriate for London due to the housing mix and applied it to a highly optimistic economic growth projection.

48. The fact that the end result is unrealistic can be best seen by comparing the TW figures with others in the SE. CL's table 4³¹ shows the TW figures compared to Three Valleys (Veolia) and Essex and Suffolk Water, which are two companies close to London and supplying the London suburbs. It can be seen that for both companies, for both the change in figures and the absolute figures in measured and unmeasured, the TW predictions are far higher. This is even though both Three Valleys and ESW are far more suburban/rural than is the London WRZ.

49. CL sought to justify his figures by referring to increased prosperity being a key issue for the purchase of hosepipes and sprinklers. However the analysis does not take into account the scale of the impact of increasing metering from 27% to 80% in London within the Plan period. The evidence shows that metering water supply has a much greater impact on discretionary use, such as garden watering, than non-discretionary use.³² Given that it is much easier to meter houses than flats (particularly in converted properties) a very high proportion of houses with gardens will be metered by 2035, so the impact of metering will be even higher in this respect. External use is largely a discretionary use which is more likely to be suppressed by metering.

50. For all these reasons CB was of the view that the Plan should be revised to assume no growth in per capita external water use over the Plan period³³. This would give a total reduction in demand in London of about 25Ml/d.

Population

³⁰ CD3.42, p 97

³¹ TWR/8p.22

³² CD3.170, Fig 5, p 10

³³ GARD/2.2 table 5 para 27 (with oral amendments). See also suggested change to plan GARD5

51. TW's population figures for the period up to 2035 provide for a very high level of ongoing population growth. GARD accepts that this work has been done in broad accordance with the London Plan and the ONS based projections and therefore accords with the EA Guidance (CD4.8). However, the end result is what now in 2010 seems obviously to be large great overestimate. There are two ways to deal with this. GARD accepts that for the purposes of consistency it would be appropriate to follow the EA Guidance, and also because of the desirability of producing a final Plan relatively quickly, and in those circumstances the figures should remain in the Plan. However, a clear indication should be given within the Plan that the population projections may well turn out to be a considerable overestimate and will need to be revisited in detail in the next Plan period. TW should acknowledge in the Plan that this will affect the robustness of the long term demand forecast. This is a further reason why basing major infrastructure on these figures would not be safe. If the figures are to remain in the Plan, the UTR should not.
52. The alternative course, which would be more analytically precise but would involve delay, would be to send these figures back to TW and require them to carry out a more robust population forecast.
53. The fundamental problem with the rdWRMP population forecasts is that they trace back to ONS trend based projections, which are based on 5 year trends. So the 2008 projection is based on the period 2004-8. This was a period of a major economic boom in the UK as a whole, but particularly in London, and a very high level of net inward international migration. It is fairly unlikely that these conditions will be replicated at all in the future but, in particular, it is extremely unlikely that the population growth which existed through the height of that boom will be replicated throughout the period up to 2035.
54. TW did recognise the potential impact of the recession and commissioned Cambridge Econometrics (CE) to prepare a model predicting the likely longer

term growth.³⁴ CE's predictions themselves have already proven to be over optimistic.³⁵ However more importantly CE predicted that long term growth would be lower than the original ONS predictions, because although growth would return it would return from a lower base. However, TW in the rdPlan have rejected their own consultants' analysis and have assumed in the Plan that growth will bounceback fully, so that population by 2021 has returned to the ONS and policy based forecasts³⁶. There is no evidential basis for this approach, it does not accord with CE's advice and it flies in the face of reality. CL did not attempt to justify that approach in any analytical way.

55. MD has calculated the effect of taking the CE modelling on the demand for water, rather than TW's approach,³⁷ and has demonstrated that for this reason alone the deficit in 2035 falls from 58MI/d to only 16MI/d.

56. There are a number of reasons why it is exceptionally unlikely that London will achieve the level of population growth predicted in the rdPlan:

- a. London's population growth is heavily influenced by net inward international migration which in turn is heavily influenced by the economy;
- b. The period upon which the trend is based was one where there was a great influx of workers from new member states in the EU. These are countries where until fairly recently travel abroad to work was highly restricted and where conditions in the home countries encouraged migration overseas for work. The particular conditions which pertained through the early and mid 2000s in this regard are unlikely to be replicated through the 25 year plan period.

57. The population growth figures used by TW are also, in part, policy based projections, but here too TW have used very high and unrealistic figures.

³⁴ CD3.44

³⁵ GARD/4.2 para 4.24

³⁶ CD1.6a fig 3.3 (reproduced at GARD/4.2 Fig 5).

³⁷ GARD/4.3, App N

- a. There is a limited amount of available land in London, particularly in the light of the fact that is already a highly built up area with a limited supply of recyclable land. Many of the large regeneration sites, such as Kings Cross, Paddington Basin and large parts of Thames Gateway have now been redeveloped;
- b. Many of the “available” sites assumed within the London Plan figures depend critically on viability issues. For example much of the planned growth relies on the redevelopment of local authority housing estates at higher densities. These projects are generally reliant on the injection of public sector capital to make them viable. In the light of well publicised public sector cuts it seems exceptionally unlikely that there will be significant amounts of public sector investment in housing over the next 3-5 years. It is possible, although wholly uncertain, whether funding will then become available for such schemes, but even if it does there will be a significant shortfall of the figures assumed in the rdWRMP;
- c. It is relevant that even in a booming housing market with a relatively high level of public sector investment in housing, the annual supply of new homes has not managed to achieve the consultation draft London Plan figure of 35,000 new dwellings;³⁸
- d. There is now the added uncertainty of emerging Government policy on planning for housing. The RSS have been withdrawn and although the London Plan has not been withdrawn it is unclear what will happen to the housing targets within it. KL cross examined MD along the lines that the Government has not announced that the intended affect of withdrawing the RSS is that there will be less housing. This is a slightly odd line of xx. Whether or not that was the Government’s intention it will, beyond any reasonable doubt, be the effect. Equally a shift towards more local decision making on residential planning

³⁸ GARD/4.2, Fig 6, p.38

decisions, and a policy shift away from treating back gardens as previously developed land is extremely unlikely to do anything other than reduce the amount of housing that comes forward in London.

58. A significant amount of the new dwellings which are to be constructed in London in accord with the London Plan are intended to serve London's existing housing needs. This is described in MD's proof as "eliminating backlog housing need".³⁹ This means that much of the new housing stock is intended to be used to rehouse people who are in legal terms now "homeless" or in need of rehousing, for example because of overcrowding. Although this would lead to an increase in the number of households it will not lead to a growth in population. MD shows that of the target of 334,000 new homes in London between 2007-2017 106,900 are being erected to eliminate housing need. The effect of this is that there could be a reduction of 27MI/d in the potential demand.⁴⁰

59. Taking the demand reductions set out above cumulatively, the alleged 58MI/d deficit at the end of the plan period entirely falls away and there would be a surplus at the end of the period. The demand case for the UTR would thus fall away.

³⁹ GARD/4.2 para 5.11 p.40

⁴⁰ GARD/4.2 para 5.15

SUPPLY

60. The overarching point about the supply side options is that TW have failed to carry out a full and proper investigation of the alternative options for meeting any S/D deficit, and have dismissed options on a series of spurious excuses. They have chosen not to investigate those other options and now try to submit to the Secretary of State that there is an urgent need to confirm the Plan and no time to investigate the other options. This attempt to manipulate the system should not be allowed.
61. TW have sought to argue that options should not be included if they have any element of uncertainty, but this is wholly unrealistic. All options have an element of uncertainty, as the EA's witnesses consistently stressed, e.g. UTR may not get planning permission. The acceptability of uncertainty depends on combining an informed view on the level of uncertainty, the benefits of the option proposed and the time available to deal with the uncertainty. Given that even on TW's figures there is no need for any strategic option for at least 15 years there is adequate time to fully investigate alternatives.

THE SEVERN TRANSFER SCHEMES

62. Supplying London with water via transfers from the River Severn has been under consideration for many years.⁴¹ In 1994 the NRA's water resource strategy identified unsupported transfers from the Severn, and transfers supported by the enlargement of Craig Goch reservoir, as sequentially preferable to the development of a new reservoir in Oxfordshire.⁴² That strategy identified a range of studies which should be undertaken to resolve remaining uncertainties. A few of these studies were undertaken to a limited extent in the 1990s, but TW have made no attempt to complete these studies to inform the dWRMP and their investigations of the Severn transfer options have been based on very scant data.

⁴¹ GARD/3.2, 4.1, pp 17-18

⁴² CD3.75

63. In terms of TW's water resource planning, the dWRMP included Severn Transfer supported by an enlarged reservoir at Craig Goch, but did not include Longdon Marsh or unsupported transfers. In respect of Craig Goch, it was said that "During periods of low flow, the River Severn would itself be regulated by controlled releases from an enlarged Craig Goch Reservoir, without which the scheme would not be viable."⁴³ Longdon Marsh was not included because of concerns about flooding.⁴⁴

64. In the rdWRMP, supported transfers using Craig Goch and Longdon Marsh were considered as feasible options. CG was rejected because of the environmental impacts on the SAC⁴⁵ and LM was rejected because of the cost of flood compensation.⁴⁶ Whilst both of those issues are of significance to the schemes and require further consideration, neither can be shown at this stage to be a "show stopper".

65. However, no consideration was given to the Unsupported Severn Transfer ("UST"), either via a pipeline or via the Cotswold Canal. The purported reason for not considering the UST was the fact that there was said to be no water available at low flows in the Severn.⁴⁷ However, even taking the figures as assumed by TW, that reason was misconceived; it ignored the fact that it is the availability of water for transfer in the winter months that makes the UST a viable option.⁴⁸ (It is perhaps surprising that that misconception has remained and indeed was perpetuated at the Inquiry with KL's questioning of JL focusing to a significant extent on the lack of water for transfer in summer months.)

66. TW rely on a claim that it did not know the "hands off" flow ("HOF") at Deerhurst until January 2010. That is a deeply unattractive point. There is no evidence that TW sought to identify the appropriate HOF prior to 2010. The suggestion that the scheme was excluded because it had been considered on

⁴³ CD1.1b, p 113 Table 43

⁴⁴ TW/3-B 3.6.26

⁴⁵ TW/3-B 3.6.20

⁴⁶ TW/3-B 3.6.26

⁴⁷ CD1.3, Section 2.8.1ii, pp 107-108

⁴⁸ GARD/3.2, 4.2.2

the basis of a “Q50” flow⁴⁹ ignores the fact that the letter relied on by TW to justify that approach specifically anticipates detailed discussion of flow restraints once a short list of potential sites has been identified. In any event the EA have confirmed that TW misunderstood that letter.⁵⁰ Further, in September 2009 the EA identified the UST as a scheme which should be given further consideration, but it was not until March 2010 that TW sought detailed guidance as to what HOFs should be used for modelling.⁵¹

67. It is remarkable that an option which on TW’s own evidence could produce a significant DO⁵² did not even feature in the unconstrained options list in the rdWRMP.⁵³ Its consideration before the Inquiry was limited in TW’s evidence to CL superficial analysis in his proof, followed by the series of rebuttals of JL. However, JL, a highly experienced water engineer,⁵⁴ gave detailed evidence as to the Severn Transfer options, which clearly showed that it was a feasible option which required further investigation.

68. TW’s approach has been characterised by a failure to properly engage with the Severn Transfer options, followed by a rigid approach to reconsidering them and then a determination to treat uncertainties surrounding the schemes as reasons for them to be wholly excluded from the Plan, without any proper consideration..

Unsupported Severn Transfer

69. The basis of the UST is that, at times when water is available in the Severn and needed in the Thames reservoirs, it should be transferred via pumping

⁴⁹ TW/3-B, 4.1.52

⁵⁰ EA/24, 3.15-3.17

⁵¹ TW/3-C, F6, p 81

⁵² 71Ml/d for the 300Ml/d transfer: TW/3-B, Table 4.2, p 118

⁵³ See also the EA’s criticism in this regard: EA/12, Part 7.

⁵⁴ See GARD/3.2, p 9. With Chris Binnie, John Lawson is one of only a small handful of water engineers who are Fellows of the Royal Academy of Engineering. By contrast, TW did not call an engineer to give evidence at the Inquiry.

through a pipe over the Cotswolds.⁵⁵ An alternative to this form of UST is that proposed by the Cotswold Canal Trust, using the Canal. GARD support the Cotswold Canal Trust's submissions to the Inquiry but leave the detail to the Trust.

70. TW put forward four reasons as to why, on their late consideration of the UST, it should be rejected: environmental impact, yield, cost and "reliability".⁵⁶

Appropriate assessment

71. One of TW's reasons for rejecting the UST after the rdWRMP was published is that no appropriate assessment of the effect of the transfer on the Severn Estuary SAC has been carried out. This reason does not stand up to scrutiny;

- a. There is no reason to think that the appropriate assessment would result in the scheme being rejected. Indeed, the only evidence before the Inquiry as to the effect on migratory fish in the Severn (the main issue in terms of impact on habitats) is that there is a high probability of an acceptable scheme being developed⁵⁷. Dr Solomon's evidence should be given weight. Although he did not give oral evidence, he is a major expert in this field and TW produced no expert evidence to counter his view;
- b. There is nothing in the Habitats Regulations, that requires the exclusion of schemes from a Plan simply because an appropriate assessment would be required in due course. TW relies on the precautionary approach, which in their view would exclude any scheme which has not already been subject to an appropriate assessment.⁵⁸ Whilst TW attempts to garner support for that approach from the Guidelines, it is important to note that the EA have concluded that the "need to undertake an Appropriate Assessment should not be a

⁵⁵ The scheme is described in GARD/3.2, p 20

⁵⁶ TW/3-B, 4.1.79

⁵⁷ Dr David Solomon's report at GARD/3.6 Appendix R2

⁵⁸ TW/3-B, para 4.1.77

reason to preclude these options going forward to the feasible list”.⁵⁹ Ms Hallatt’s evidence was clear that the lack of an AA did not mean that a scheme could not go into the contingency list, or be considered “not feasible”;

- c. Treating an appropriate assessment as a pre-requisite to inclusion in the Plan would allow TW to choose not to include a particular option simply by failing to carry out an appropriate assessment at the proper time;
- d. There are other examples of options being included in a WRMP despite a requirement for an appropriate assessment. For example, the Abberton Reservoir was included in Essex and Suffolk Water’s WRMP preferred programme despite the fact that no appropriate assessment had been carried out. The scheme is now being constructed. Further, as pointed out by Ms Hallatt of the Environment Agency,⁶⁰ TW have been inconsistent in putting schemes into the unconstrained options list which required AA;
- e. For the reasons set out above, the UST would only need to be included as a contingency in the WRMP. A precautionary approach does not require that the deliverability of contingency schemes be guaranteed. Indeed it would make a nonsense of resource planning if all contingency responses had to be ready for immediate implementation. As the EA stressed all options have an element of uncertainty, and this cannot be a ground to rule them out at this stage;
- f. The EA’s position is that the UST should have been put on the unconstrained options list.

72. For those reasons, TW’s first reason for rejecting the scheme is unsustainable. Whilst it is clearly convenient for TW to point to the absence of an appropriate assessment, it merely exposes the fact that for no good reason TW has failed

⁵⁹ EA/24, para 3.11

⁶⁰ EA/24, para 3.19

to engage with the UST as an option until very late in the day, when forced to do so by GARD and the EA.

73. It has also been suggested that there could be adverse environmental impacts of discharging Severn water into the Thames. The only expert evidence on water quality before the Inquiry (Ms Stacey) suggests that it is unlikely that the UST would have a significant impact on water chemistry in the Thames.⁶¹ TW's own advisors, Jacobs, freely acknowledge in their report on Severn transfers supported by Longdon Marsh that little data is available and more work would have to be done on this issue before firm conclusions could be reached.⁶²

Deployable output

74. A significant difference between GARD's analysis and that of TW is that TW calculate the deployable output of the UST as being significantly less than that calculated by GARD. TW declined to provide GARD with full access to their WARMS model and therefore JL developed his own model, based on certain data from the WARMS model.

75. The results of that modelling show that for a transfer capacity of 120MI/d, a DO of 71MI/d is available. If the transfer capacity is increased the 200MI/d a DO of 100MI/d is available, and at a transfer capacity of 300MI/d the DO rises to 125MI/d.⁶³ TW's assessments give DOs of 35MI/d for a transfer capacity of 120MI/d and 64MI/d for a transfer capacity of 200MI/d.⁶⁴ There are clearly significant differences in these figures.

76. Whilst TW's initial approach was to attack JL's modelling (it might be recalled that JL's model was "a flawed, inferior, unsophisticated simulation of the system" the output of which was "bound to be incorrect and unreliable"⁶⁵), during the course of the Inquiry it became clear that the difference in DO

⁶¹ GARD/3.3, App 2, Report of Claire Stacey

⁶² CD9.11a, 4.4.6

⁶³ GARD/3.6, p 25

⁶⁴ TW/137 Table 3

⁶⁵ TWR/9, 3.1.5

between JL's modelling and that of TW's was down to a series of refinements made by JL to the operation of the Lower Thames system to accommodate the UST. There is no continuing suggestion that JL's estimates of DO are incorrect due to any limitation in his model.

77. The refinements in JL's analysis are:

- a. A "trigger rule" which is based on the levels of water in the Lower Thames reservoirs, rather than on the flows over Teddington Weir. As JL explains, TW's trigger rule would result in water not being transferred when it is both needed and available, thereby substantially lowering deployable output;⁶⁶
- b. A rule to avoid pumping water when the Severn is in spate as a means of avoiding pumping silty water;
- c. Changes to the Lower Thames Control Diagram to ensure that River Thames flows over Teddington Weir and customer supply restrictions in droughts remain as close as possible to the present situation.

78. It does not appear that TW criticise either the trigger rule or the spate avoidance rule (which reduces DO) in JL's scheme. However, CL rejects the changes to the LTCD. We submit that those changes must be made to properly assess the benefits of the scheme:

- a. The purpose of the LTCD is to ensure that service levels are met, and that flows over Teddington Weir are maintained for ecological and navigational reasons. Revising the control of the reservoirs on the Thames should not be a controversial proposition so long as those flows and service levels are unaffected;
- b. The introduction of a significant new resource or a sustainability reduction on the Thames would in any event result in a change to the LTCD. CL accepted this in xx. The position is that the only evidence

⁶⁶ GARD/3.6, paras 2.4.33 to 2.4.38

before the Inquiry is that such changes would occur if, for example, the UTR were to be introduced;

- c. The performance of the Severn Transfer options can only be sensibly understood by making the changes which in practice would be necessary if those resources were introduced. There is a particular need to change the control of the reservoirs for a resource where an entirely new source of water is being introduced into the Thames catchment, which will necessarily change the water that is available and the pattern of reservoir filling. The consequence of not changing the LTCD in this case would be that energy is used in pumping water to the Thames when it is not required and water is effectively lost over Teddington Weir;
- d. Whilst the EA understandably seek to uphold the LTCD in its present form to provide a level playing field, there appears to be a general acceptance that the LTCD would have to be altered to accommodate a new resource, and there is therefore a useful purpose in looking at the impacts of changing the diagram to establish the true DO.

79. JL's evidence demonstrates that the effect of failing to change the LTCD is a large increase in flows over Teddington Weir, which consequently depresses DO.⁶⁷ That is plainly contrary to the intention not to allow new resources to alter drought flows over Teddington Weir in accordance with the terms of the LTOA. TW's approach would develop a resource but then not make necessary adjustments to accommodate it in the current system, such that it becomes inefficient.

80. Furthermore, TW has not rebutted JL's observation that their modelling of the UST has failed to use all available reservoir storage⁶⁸, with consequent depression of DO. This is another reason why TW have underestimated the deployable output of the UST.

⁶⁷ GARD/3.6, 2.4.11 and 2.4.15-24.

⁶⁸ GARD/3.6, paras 2.4.39 to 2.4.41

81. Finally, it should be noted that the basis upon which the DO of the UTR has been assessed has not been demonstrated to the Inquiry. GARD has requested the WARMS modelling data for the UTR but that request has not been acceded to. JL has put forward a fully justified and carefully analysed basis upon which to assess the DO of the UST. He has done so in the real world, in the sense that he has removed artificial constraints which limit the DO of the resource and calculated its benefit with the modifications to the system which inevitably would be sought and achieved should such a scheme be introduced. It is not clear whether TW has done the same in assessing the resources which it seeks to promote at this Inquiry.

82. It follows that the UST has the potential be a very significant strategic resource, providing a DO of between 71MI/d and 125MI/d depending on the transfer capacity of the pumps and pipes.

Cost

83. The DO of the UST justifies, in itself, the further development of this resource option and its inclusion in the contingencies for this plan period. GARD's position is that the costs of the UST put forward by TW are over-inflated. For a 200MI/d transfer providing a DO of 100MI/d, GARD consider that the capital cost would be £225.3m whereas TW consider that it would be £301.5m.⁶⁹ However, it is recognised that there are limits as to how far these issues can be (or need to be) resolved at this Inquiry. Ultimately the costs differences probably do not matter very much. If JL is correct on the DO of UST, then even on TW's costs it is a significantly cheaper option than the UTR - £2.9 million per MI/d of DO for the 300 MI/d unsupported Severn transfer, compared with £6.2 million per MI/d of DO for the 50 Mm3 Upper Thames Reservoir.⁷⁰

84. In short the criticisms are that (i) the unit rates for the pipeline are too high and (ii) the allowances for on-costs are too high. The differences are set out in

⁶⁹ See CD1.14 and GARD/3.6 pp 25-27 and App R5.

⁷⁰ GARD/3.7, paras 2.14 & 2.15

the “Scott Schedule”⁷¹. JL relies on the “GATOX” pipeline construction costs, which relate to a recent water pipeline project undertaken by TW in similar terrain. TW rely on different methods for estimating the costs. TW has not provided the audit reports of their costs estimates referred to by CL.⁷²

85. It is clear that the costs advanced by TW may well be lowered to closer to JL’s estimates. However, even if such costs savings cannot be achieved there is a still a strong case for the development of the UST.

“Reliability”

86. In the written evidence, this point was limited to a concern about the reliability of the deployable output predictions because of a difference between gauged flows and modelled flows.⁷³ JL addressed this point by reducing the flows at Deerhurst by 10% by way of sensitivity analysis. The effect of yield was found to be small (5.5% of DO for the 200MI/d transfer) and could be countered by increasing the transfer pipe capacity from 200 MI/d to 220 MI/d to increase the amount of water abstracted from the Severn when it was available.⁷⁴

Another reason for scheme rejection?

87. In xx, KL advanced a series of propositions to JL which seemed to suggest that the UST should be rejected as an option because of the lack of availability of water in the summer months, and because if a worse drought than the worst recorded occurred (such as the 1976 drought, without the rainfall of September 1976) the scheme would fail to ensure security of supply. The point was repeated in a note (TW/116) and in TWR/9c.

⁷¹ CD1.14

⁷² TWR/9, 3.8.16

⁷³ TW/3-B, 4.1.79

⁷⁴ GARD/3.6, 2.2.4-2.2.7, p 7. See also GARD/3.9

88. The fact that the scheme primarily operates at certain times of the year, and that supply may fail if a worse drought than the worst on record occurred, is an entirely misconceived reason for rejecting the scheme, as it would be for any other scheme. Deployable output is calculated by reference to the point at which the system would fail taking the “worst” drought on record.⁷⁵ The fact that the scheme would fail in a worse drought than the worst on record is self-evident; if it did not, it would not have been designed to meet the worst drought on record and the assessment of its DO would be wrong.

89. The pre-occupation with water being unavailable in the Severn at certain times when the Lower Thames reservoirs are not full shows a further misunderstanding of how water resource deployable output should be assessed. The deployable output of the UST reflects the fact that water is not available for transfer at all times (hence the deployable output is less than the capacity of the transfer pumps and pipe). In any event, TW’s analysis is premised on their inefficient “3000-10” transfer rule, and fails to recognise the principal benefit of the unsupported Severn transfer, which is to ensure that the Lower Thames Reservoirs are full at the start of a summer drought.⁷⁶

90. In fact, the purported analysis in TW/116 highlights precisely why looking to resources in the Severn catchment is prudent water resource planning. The catchments respond differently to droughts. The Severn is a larger river than the Thames, responding quickly to rainfall. The Thames is heavily reliant on groundwater, drops less quickly in a summer drought, but therefore responds slowly to rainfall and takes longer to recover after droughts. It follows that there are clear benefits in terms of drought resilience from looking to resources in the Severn.

Further benefits of UST

91. In water resource planning terms, a significant benefit of UST is that it can be the first stage of a Severn Transfer supported by Longdon Marsh or Craig

⁷⁵ CD4.10, Part 4 and CD4.8, pp 5-7. See also the EA’s position at EA/21, para 3.3 and 3.4.

⁷⁶ GARD/3.10, paragraph 2 and table

Goch, if that should ultimately be proved to be needed. Developing the UST would allow a future response to a step change in water demand, for example if large sustainability reductions were confirmed. TW's only reason for rejecting the benefit of the incremental approach is that it finds fault with each of the elements, but again these are clearly worthy of further and much more detailed study.⁷⁷

92. Whilst many issues around the UST cannot be resolved through the medium of a public inquiry, what JL's evidence shows beyond any doubt is the need for a thorough, robust and truly independent assessment of this option.

Longdon Marsh

93. The construction of a new reservoir at Longdon Marsh to support transfers to the Thames was rejected by TW on the basis of the cost and environmental impact of providing flood compensation.⁷⁸ The central dispute is that GARD does not consider that floodplain compensation storage need be provided and is of the view that an engineered solution in the form of flood pumping into the reservoir would be an appropriate means of addressing flood risk. A scheme for flood pumping is explored in JL's evidence with support from Professor Edmund Penning-Rowse.⁷⁹ It is of relevance that JL and Professor Penning-Rowse are acknowledged experts with great experience in this field, they are not proposing some "wild" and impractical alternative. JL made clear that the scale of pumping he was proposing was perfectly normal and feasible. The EA has said that such an engineered solution can be considered⁸⁰ and in principle TW accepts that pumping would provide a possible solution.⁸¹ KL in xx of JL raised the potential concerns of local residents in an area notorious for flooding. However, there is no reason to think that a reservoir or an engineered solution to flood mitigation would be rejected by the residents of Tewkesbury, because such a solution would be able to provide flood alleviation for floods with short return periods which cause problems in that

⁷⁷ Lambert EiC

⁷⁸ TW/3-B, 4.1.45-47

⁷⁹ GARD/3.6, 3.3.1-6 and Appendix R2

⁸⁰ EA/12, Appendix 7, Section 3.2

⁸¹ TWR/9b, A2.13, p 39

area. Public response will very much be a product of how such a scheme is presented and a good communications strategy.

94. Further, GARD disputes the approach taken by TW to the size of the reservoir required. TW appear to accept that a 50Mm³ reservoir would be large enough to provide 200Ml/d. TW's contention is that a 50Mm³ reservoir would not be feasible because it would be too shallow to ensure water quality is maintained. GARD do not accept that argument for the reasons given in JL's evidence and set out in more detail by Mrs Stacey in her report.⁸² No water quality evidence is advanced by TW in support of their contention.

95. Regardless of the correctness of TW's position on water quality, it goes on to cost a 125Mm³ reservoir for the purposes of comparison with other programmes. However, the maximum possible DO of such a reservoir is far higher than 200Ml/d and perhaps as high as 600Ml/d. TW's approach of comparing the full costs of the larger reservoir, when only part of the resource is used to provide additional DO in the Thames region, means that the costs of Longdon Marsh and the UTR are not assessed on a like for like basis.⁸³ The correct approach would be only to allocate part of the cost of the reservoir in making a costs comparison or assessing the cost against the higher maximum DO. These issues relate back to the fundamental issue of why it would be misconceived to make any strategic decisions whilst the level of SR on the Thames is unknown.

96. It follows therefore that the rejection of Longdon Marsh on costs grounds is not sustainable because (i) flood compensation is not required given that an engineered solution is available; and (ii) a larger reservoir would provide a significantly higher DO and/or allow resources to be used by other water companies, meaning that only part of the capital cost of the reservoir should be allocated to increased DO in London for the purposes of costs comparison.

⁸² GARD/3.6 Appendix R6

⁸³ Further, see Owen Turpin's criticism of this approach in EA/18, 3.11: "It is not reasonable or good water resources planning to force option sets to produce a similar level of surplus".

Craig Goch

97. A supported Severn Transfer using Craig Goch reservoir is rejected out of hand by TW because of the alleged harm to the SPA. It is perhaps ironic that it was only this option and not the UST or Longdon Marsh which was considered in the dWRMP. What is clear is that the enlargement of Craig Goch reservoir could provide a very high DO in the London WRZ – a DO which is significantly greater than the UTR. Should a large SR be required, the case for pursuing Craig Goch would be significantly strengthened.
98. Moreover, should a large SR on the Thames potentially create issues around security of water supply for London there would have to be very real consideration of whether the harm to the SPA could be justified by imperative reasons of overriding public interest.⁸⁴
99. Whilst the Welsh Government has indicated its displeasure at Welsh resources being considered as possible sources of water for London,⁸⁵ that letter was written on the basis of a report which did not explore the environmental impacts around the enlarged reservoir and which was based on a very superficial analysis of costs⁸⁶. There is therefore only a very limited evidential basis for the criticisms of the Craig Goch scheme contained there. Again, if significant SRs are required on the Thames the question of whether some environmental harm may be justified will have to be revisited. That further consideration cannot be carried out until all the relevant investigations have been completed, the SR is determined and a proper comparison can be undertaken.
100. In short, Craig Goch continues to be a feasible option and an attractive one should very large SRs be required. Again, this emphasises the need to be flexible to allow for future SRs without committing to resources on the assumption that a particular level of SRs is inevitable.

⁸⁴ See Regulation 62, Conservation of Habitats and Species Regulations 2010/490

⁸⁵ TW3-C, App F9, p 89

⁸⁶ GARD3.6, para 4.5.2 and JL's cross-examination

Conclusion on Severn Transfer

101. GARD's case is that the Severn Transfer options should be placed considerably above the UTR in water resource planning for TW's area. TW has consistently failed to engage with the Severn Transfer options, and therefore now relies on an absence of evidence as to feasibility as a reason for scheme rejection. What is required now – and what we invite the Inspectors to recommend to the Secretary of State – is a requirement on TW to develop the Severn Transfer options including resolving any uncertainties about the impacts on the Severn Estuary SAC of the UST.
102. JL has carefully identified a programme of work which GARD submits should be expressly endorsed by the Secretary of State.⁸⁷ That work will require concerted, co-ordinated effort by TW, other water companies and the EA. It will require independent scrutiny at each stage of the process. It is a process which the TW must be directed to carry out to ensure that it cannot rely on or repeat its own failure to explore supply side options as a reason for favouring a particular strategic scheme which it has considered in more detail.
103. GARD fully accepts the need for Appropriate Assessments of the impact of the various Severn transfer options on the Severn Estuary and designated sites in the Craig Goch area. These assessments should be undertaken in parallel with the investigations recommended in JL's evidence⁸⁸, using the results of the investigations to inform the assessments. The Appropriate Assessments require the schemes to be developed and optimised before the assessment is carried out, to ensure that the proposal assessed is the one which would be developed in reality.
104. In view of the reluctance TW has shown to investigate the Severn transfer options and the partiality that it has demonstrated in the limited investigations it has undertaken, it is essential that the investigations now needed should be fully and independently audited at every stage. It is GARD's

⁸⁷ GARD/3.2, Section 9.3 and Table 12.

⁸⁸ *ibid*

contention that, in view of the strategic significance of the Severn transfer options and their trans-regional nature, the required investigations should be overseen by a Steering Group with representation from the several water companies affected and the Environment Agency. The Steering Group's primary objectives should be firstly to ensure that the investigations are truly impartial and secondly to ensure that the views of interested parties are taken into account at appropriate times, including the development of terms of reference for the studies. We urge the Inspectors to recommend the formation of the Steering Group to the Secretary of State, potentially using the model of the Water Resources in the South East process as a way forward.

INDIRECT POTABLE RE-USE

105. TW reject the inclusion of a new indirect potable re-use (IPR) schemes at Deephams and at Hogsmill on the basis of cost. GARD submits that both schemes would be appreciably cheaper than the UTR and provide a significant contribution to DO (Deephams providing 95Ml/d and Hogsmill B 20Ml/d).

Choice of technology

106. TW's position in the rdWRMP in respect of IPR is to presume that reverse osmosis (RO) is required in any re-use scheme. The effect of that presumption is that any IPR scheme is likely to perform less well than a new reservoir resource in terms of energy costs (and hence operational expenditure and carbon costs) because RO is very costly in terms of energy use. Not only is TW's approach to IPR inconsistent with its stated approach to carbon,⁸⁹ it also finds little evidential support in terms of engineering, water chemistry or current experience. Moreover, it is inconsistent with TW's stated strategy that: *"Where any Planned IPR scheme is considered, prior to promotion, detailed feasibility studies, including pilot trials, associated environmental, health and public perception studies, will be undertaken in conjunction with a risk*

⁸⁹ TW/4-B, 5.3.8, p 44

*assessment in line with the approach to Water Safety Plans. This will inform technology selection”.*⁹⁰

107. Indeed, in xx CL appeared to believe that technologies other than RO were being tested in the pilot plant at Deephams. It transpires, following the issue of a note,⁹¹ that he was not correct and only RO is being piloted, as GARD believed to be the case. It might be questioned how familiar CL was with his own evidence in Annex 3 of TWR/8 that TW had taken a “conscious decision to use membrane technology [i.e. RO] in their current pilot trials”.

108. The crucial difference between GARD and TW is that GARD do not consider that it is necessary to consider IPR schemes with a presumption in favour of RO. Alternative conventional processes – such as those used in the IPR scheme at Langford in Essex – are likely to be adequate and must be properly investigated. That is the evidence from CB, an engineer with vast experience of water resource development who draws on the expertise of a former Deputy Drinking Water Inspector (Mrs Stacey) where necessary. With respect to CL, whose evidence spanned almost the entirety of TW’s case at this Inquiry and appeared to have little knowledge of the trial at Deephams or the wider issues, it is submitted that CB’s evidence on IPR should be preferred.

109. TW, and CL, rely to a large extent upon international examples and the comments of international experts as to the appropriate treatment regime for IPR schemes. The international schemes referred to by TW are in materially different circumstances to those pertaining in the UK.⁹² Similarly, the international expertise⁹³ relied upon would have ruled out conventional treatment processes at Langford, where there is no evidence of any problems in terms of drinking water quality.⁹⁴ It appears that the international experts

⁹⁰ CD3.77, Deephams 95Ml/d Effluent Reuse Scheme, April 2010, p 8

⁹¹ TW/103

⁹² CB EiC. For example, several of the schemes are groundwater recharge schemes.

⁹³ TWR/8 p 72 (Mr Van Houtte)

⁹⁴ As accepted in XX by Dr Lambert

may be applying experience from their own circumstances which is not directly applicable to the situation in the Thames catchment.

110. In addition, TW emphasise the nature of catchment at Deephams, which is said to be of an industrial nature and therefore the effluent at the STW is more likely to require RO treatment. This assertion is not supported by any substantive evidence as to the particular characteristics of the influent. Although there are plainly industrial activities in the surrounding area and a number of discharge consents, it would be necessary to understand the processes being undertaken, the terms of the licences and the steps that could and should be taken to control polluting discharges in order to have any confidence as to whether TW's argument actually had any validity. CB's evidence supports the following observations:

- a. Langford also has industrial users in its catchment, so it is a question of degree whether the level of industrial activity in the catchment is such that RO is required;
- b. Commercial discharge consents are subject to terms as the nature of the discharge, and a monitoring and inspection regime, and therefore are amenable to control;
- c. Some of the substances said to be of particular concern – such as endocrine disrupting compounds – arise in domestic effluent;
- d. The key water quality issue is at the point at which water enters the drinking water system. The benefit of indirect – as opposed to direct – potable reuse is that there is dilution and the ability to cease abstraction should there be a pollution incident;
- e. In the absence of any detailed evidence as to the catchment characteristics, the only robust course of action would be to test the adequacy of a process such as that used at Langford.

111. In short, to say that the technology required for an IPR scheme is dependent on the catchment of the sewage treatment works is to assume that it

is known what technology is appropriate for a particular catchment. In the UK, the only experience of planned IPR is at Langford, where RO has not proved necessary. Any need for RO elsewhere must be assessed on the basis of trials of appropriate technology, rather than an assumption that it is inevitably required. The fact is that TW does not know whether such technology is required to ensure water quality in the Deephams or Hogsmill B scheme.

Public perception

112. TW have suggested that public perception issues are critical in promoting IPR schemes. Whilst public perception is doubtless important, it should be remembered that effluent reuse – in the sense of unplanned, indirect reuse, happens routinely in the River Thames and that much is understood by many Londoners. Therefore there is a basic acceptance of the principle of reuse. The public response to any planned reuse scheme will depend on the appropriate information being made available. It is obvious, for example, that the Langford scheme was successfully promoted and now is an important supply source for Essex and Suffolk Water. There was extensive public consultation, appropriate amendments to the scheme and then a high level of public acceptance. Public perception issues are therefore not by any means necessarily barriers to scheme delivery, nor are they determinative of the appropriateness of RO or any other process for the treatment of the waste water. These are matters which need to be carefully handled with an appropriate level of public information provided.

Risk

113. For the avoidance of doubt, CB and GARD do not suggest that there should be an automatic assumption that a Langford style process would be appropriate for the Deephams or Hogsmill B schemes. On the contrary, it is submitted that proper consideration should be given to the appropriate choice of technology and that, in the absence of any convincing evidence that RO will inevitably required, these supply options should not be excluded on the basis of the cost of RO technology. A proper trial should be undertaken

involving RO and conventional processes in order to reach a fully informed decision.

OXFORD CANAL TRANSFER

114. Transfer of available groundwater in the Birmingham to the Thames via the Oxford canal can supply a deployable output of 15 Ml/d to either London or the SWOX zone at a low cost compared to other options. In his rebuttal⁹⁵, JL has countered all the reasons TW have put forward for rejecting the scheme⁹⁶. JL's response was not challenged by TW at any stage. Again TW's case seems to be that it is not possible to be certain at this stage that the Oxford Canal scheme would work. However, as with the other options TW's failure to carry out proper investigations should not allow them to reject the option and proceed with the UTR.

115. Therefore GARD invites the Inspectors to conclude that the Oxford canal transfer scheme should be included in the list of preferred options, with a high priority for early implementation if the need arises.

⁹⁵ GARD/3.6, Section 5, pp 41 & 42

⁹⁶ TW3/B, 4.1.132 to 4.1.145

CONCLUSIONS

116. TW have palpably failed to follow the directly relevant and up to date EA Guidance. This is the end of the case as far as the UTR is concerned, as without the SR of 100 MI/d there is no case for the UTR being in the Plan. Indeed, no major new strategic resource would be required in the plan period.
117. TW's case for including the UTR in this Plan based on the potential Water Framework Directive requirements is clearly without substance, and relies on an analysis of possible actions by the EU which is wholly unrealistic. TW's approach to SRs should therefore be entirely rejected.
118. TW's demand forecasts are seriously flawed in at least two respects. It cannot be said to be "robust" or fit for purpose to plan long term capital intensive infrastructure on these projections.
119. TW have chosen to not investigate a number of other options which could meet the alleged need, because (seemingly for reasons of profit) they have decided to single-mindedly pursue the UTR. TW should not be allowed to manipulate the system in this way and should be made to properly and independently appraise all the other options.

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