

Appendix C & D for Ofwat consultation response 11 April 2022

These appendices were sent attached to a letter to Portsmouth Water (copied to Southern Water) in February 2022, to share my significant concerns about the Southern Water proposals. A few minor updates were made before attaching them in this separate document for Ofwat, to help clarify some of the issues.

Appendix C

Feedback on proposed planning route, options appraisal & public consultation to date

1. Planning application process

Southern Water (SW) proposes to apply for a Section 35 direction from the Secretary of State (SoS) to go down the Development Control Order (DCO) route rather than submit a planning application to the LPA.

- The proposal for effluent re-use and the associated infrastructure does not meet the criteria for a National Infrastructure Project, as confirmed by SW.
- Councillors and the public were reassured by the LPA at the time of the Planning Committee for the original reservoir planning application that if effluent recycling were proposed then a new EIA and planning application would have to be submitted.
- The community is concerned that SW are trying to achieve a planning consent through the backdoor, avoiding local public accountability by pursuing the DCO route rather than a planning application to the LPA. This reinforces the concern that SW cannot be trusted. This is having an adverse impact on how members of the local community view Portsmouth Water (PW).

2. Options appraisal process

2.1 SW have repeatedly failed to carry out a robust options appraisal process and do the right thing in previous WRMP optioneering over the last 20 years.

- In two previous Water Resource Management Plans (WRMP) Southern Water dismissed taking water from the spring fed Havant Thicket Reservoir (HTR) as a viable option at an early stage for no sound reason.
- SW even indicated in one plan that they dismissed HTR because PW had told them it was not a viable option, even though it was clearly in the PW WRMP at that time. When challenged by PW Managing Director on the misleading information being provided the SW Chief Executive promised to remove the inaccurate text from the plan. SW went on to publish the plan, did not remove the incorrect text, and still failed to consider HTR any further in the planning process.
- Instead, SW pursued the Fawley desalination plant as their preferred option, even though they had not done a robust Environmental Impact Assessment or Habitats Regulation Assessment (HRA) and significant concerns were raised by stakeholders and the public. The Environmental screening they had undertaken was clearly not robust as it should have been obvious that there would be a significant adverse impact on European Protected Sites, a huge energy requirement and a massive carbon footprint.
- Having spent a lot of unnecessary time (years) and money pursuing the desalination option SW now recognise that the Fawley desalination plant is not a viable option, indicating that this is due to the adverse environmental impacts.

The information set out above shows that SW cannot be relied upon to carry out a robust options appraisal process, and that any appraisal they undertake will have to be carefully reviewed and challenged.

The high level and largely redacted information in the Gate 2 documents only add to the scepticism about the SW options appraisal process.

2.2 SW have now jumped from the Fawley desalination plant to effluent recycling via the Havant Thicket Reservoir as their preferred option (B4). Yet again SW have not undertaken a robust options appraisal process;

- The HRA screening completed is not robust and this leads to an inappropriate conclusion in relation to the B4 option. It is highly likely that the Habitats Regulation Assessment for B4, if done robustly, will also show a significant adverse effect on a European Protected Site (Langstone Harbour). It **will certainly have an adverse in-combination effect with the original reservoir proposal**, which has not been highlighted, because the benefit to Langstone Harbour which formed a key part of getting regulator support for the reservoir from both the EA and NE will be lost.
- The Environmental screening is not robust and leads to inappropriate scoring.
- The screening is done at such a high level that it is missing key issues and thus the outputs cannot be relied upon & are likely to be wrong.
- The likely significant impacts on water quality in the reservoir have not been considered and are dismissed without any factual information to back up their statements. As a result wider impacts on ecology, biodiversity and the environment have not been considered.
- The impacts of the changed compensation discharge to the wider environment have not been considered adequately, including downstream in the streams and at Langstone Harbour (SPA, SAC, RAMSAR).
- SW appear to be assessing the impacts primarily as a pipeline and building project, ignoring the risks and environmental impacts of mixing recycled effluent in the reservoir.

The options appraisal process and environmental screening has been undertaken at such a high level, it does not take into account many key issues and as a result the outputs from the options appraisal process cannot be relied upon.

2.3 The decision to select Option B4 brings with it additional risks;

- Reverse Osmosis is not an established treatment process for effluent recycling at this scale in the UK (recognised in SW HT report, page 29). This means that;
 - The market may not have confidence in the validity of such an option, and
 - The public may not accept drinking water that is created from effluent recycling, it will certainly taste different to the water they are used to and this may give rise to concerns and complaints.
- The risk of customer acceptance associated with the change in taste of the water has not been determined (Annex 3, Page 53)
- Risk of reputational damage to SW and PW (recognised in SW HT report, page 27, table row 5)
- SW state that agreement for using up to 75MLD from HT requires significant re-design not currently part of PW's planning application, therefore this is a major risk (Annex 5, page 284).
- Peel Common / Portswood WRP could be seen as a standalone scheme to support Gaters Mill WSW (Annex 5, page 284). i.e. There clearly are other options.

2.4 SW have indicated that to reduce the risks they are already engaging proactively. Yet I am a SW customer who will receive this water and have previously made detailed comments on earlier versions of SW WRMP's, yet I have received no contact from SW and have been completely unaware of any engagement that has taken place until May 2021 when the initial consultation was already over, then nothing until the publication of the Gate 2 documents hit the local media in December 2021.

As an informed customer with 17 years of experience in the local water industry I have found the Gate 2 documents very difficult to read and get any useful information out of. The redaction of all the potentially useful information makes the publication of the documents fairly pointless. It is essential that unredacted documents are made available to the HTR stakeholders and a meaningful summary with maps is made available to the public to enable real engagement to take place.

2.5 The findings of the public consultation undertaken to date has a bias because a large proportion of the people who were engaged in the consultation process lived close to the originally proposed Fawley desalination plant. SW HT Report, Page 35, confirmed that;

- 60% of people agreed that water recycling alternatives would be acceptable.
- 38% of those people responding lived close to the base case (desalination).
- 30% disagreed or disagreed strongly (28% neither agreed or disagreed)

As Option B4 was not a preferred option in SW WRMP19 there would have been no reason for people living close to the reservoir to get engaged. As a result, those living close to HTR have not been given the same opportunity to comment on the SW options appraisal.

2.6 There is significant public concern about the SW options appraisal process and the move from desalination as the preferred option to effluent reuse via the Havant Thicket Reservoir (Option B4), especially without robust public consultation. The public reaction to the SW preferred option is extremely sceptical. No one who has raised the SW proposal with me (including stakeholders) can fathom how this can be seen as an environmentally preferred option. Very valid issues that they highlight include;

- Given that water is very heavy and energy / carbon hungry to pump, how can pumping water 35km to Otterbourne every day for 70 years (plus) be a preferred option from an environment and cost perspective. Let alone the carbon and other environmental impacts of the pipeline construction itself.
- The treatment technology is the same as that which would have been used in the desalination plant. Proposal B4 will have the same energy and carbon costs, will still produce liquid effluent, which is high in contaminants, therefore, it is no better than the Fawley desalination option which is now rejected by SW on environmental grounds.
- In addition, they point out the additional energy and carbon costs associated with building another pipeline to Budds Farm and the aeration system needed in the reservoir to provide adequate mixing of sources.

Note: The aeration system to be installed in the reservoir was to be used when/ if needed as the risk of eutrophication/ stratification was low. With the input of recycled effluent these risks will be higher, and it is likely the aeration system (or other alternative) will need to operate 24 hours a day, 365 days per year, significantly increasing the energy / carbon use of the reservoir and changing the Environmental Impact Assessment.

- Sewage is produced closer to Otterbourne than Budds Farm Sewage Treatment Works (STW) so why pump recycled effluent 35km? If SW are convinced that effluent reuse is the preferred way forward and will be acceptable to their customers to drink, then why not build the infrastructure where the water is needed to avoid the massive energy and carbon footprint associated with the pipeline and water transport. Instead they should source the sewage closer to Otterbourne and build an environmental buffer lake at Otterbourne. This is SW Option B5 and should be preferred (see also 2.8 below).

Note: There is a large pipe store and a solar panel site located adjacent to Otterbourne WTW, why can the pipe store/ solar panel site not be relocated, and the site used for an environmental buffer lake?

As no one can understand how B4 has come out as a preferred option, when common sense tells them it cannot be, there is significant distrust in the SW options appraisal process.

2.7 SW have not considered all the options. The reports refer to the assumption that filling of the reservoir will only take place in the winter. With the Minimum Residual Flow (MRF) conditions on the Havant & Bedhampton (H & B) Springs Licence it should be possible to pump water up to the reservoir over a longer period when excess water is available in most years.

- With climate change and predictions for more heavy rain forecast, the aquifer can be expected to top up more in future years, which would result in an increased flow to the H&B Springs. The impacts of climate change on future flow from the aquifer to the springs could be investigated by modelling to establish the extent of the benefit it could bring.
- The MRF conditions at H&B Springs do not apply at high tide when the lower reach of the Hermitage Stream (and other stream channels) is inundated with tidal water. Therefore, even when freshwater flows are lower in the summer there is still the potential to pump the freshwater naturally discharging from the springs up to the reservoir for part of each day.

Note: To take advantage of these options it would be necessary to install a more robust infrastructure for monitoring the overflows at the springs. This would be quite a small cost when compared to other options. The benefits of having more accurate and reliable information on the spring overflows would certainly outweigh the cost.

2.8 Why move the water so far?

If the water is needed at Otterbourne WTW (or in West Hampshire) to offset the loss of abstraction from the River Itchen & Test then;

- a) Why is the option that recycles sewage and stores it in an Environmental Buffer Lake close to the Otterbourne WTW not being considered more rigorously? *(It must be lower cost and more environmentally friendly to avoid pumping large volumes of water 35km for more than 70 years, plus it removes the need for the environmental footprint of a 35km pipeline)*
- b) Why are SW proposing to pump recycled sewage effluent from the Budds Farm STW to Otterbourne when there are other sewage works much closer to Otterbourne?
- c) Why is the sewage not being taken from a STW in West Hampshire? Particularly one which currently discharges into a river, then there would be the double environmental benefit of reducing the amount of sewage discharged into our rivers, and of recycling effluent. For example; I believe the Romsey STW discharges into the River Test, the Portswood STW & Chickenhall STW discharge into the River Itchen. There is also a STW at Millbrook which would be closer to where the water is actually needed.

- d) If there is a genuine reason that sewage cannot be recycled from any of the smaller works which discharge into Hampshire rivers, then why can Peel Common STW not supply sufficient sewage for recycling and pump it to Otterbourne, as it is a very large works and that is where the trial recycling plant has already been located? Why is there a need to pump sewage or recycled effluent the extra distance from Budds Farm?

The requirement to move water from Budds Farm STW via HTR to Otterbourne will require two pipelines, including a 35km pipeline. These pipelines require;

- A pipeline to cross below Brockhampton Stream and Hermitage Stream, immediately adjacent to Langstone Harbour (SAC, SPA, RAMSAR)
- A pipeline to cross below the River Itchen (SAC)
- A pipeline to cross the River Meon (Compensatory SAC habitat & SSSI)
- A pipeline below the A3(M)
- A pipeline below the A27
- A pipeline below several main line railway crossings
- Diverting the pipeline around blocks of Ancient Woodland

It is not credible that option B4 is the best, most environmentally friendly option.

2.9 Why is Option B5 not the preferred effluent recycling option?

In the Gate 2 summary report, Pg 9, Table 2, for the 1 in 500 year scenario, which SW indicate they are now planning for, the HTR D2 option drops to being the 5th ranked option, so is not a preferred option. Page 10 confirms that HTR is not a preferred option due to Option D.2; “being unable to mitigate for the extent of DO shortfall on account of finite water being available in Havant Thicket and the expected duration and severity of a severe drought. With B4 or B5 becoming the Emerging Preferred Option”.

“Through the development of the options in the lead up to Gate 2, it was concluded that for Options D.2 and B.2, the natural evolution would be into B.4 and B.5 respectively and as such, were removed from consideration in the Options Appraisal due to their inability to meet the increased requirements alone”.

If you do not pursue Option D2 as a preferred option, then logically option B4 should not be a preferred option either as the 35km pipeline to Otterbourne can no longer be assumed to be in place for Option B4.

However, Gate 2 summary report, page 10 goes on to state;

“Option B.4 was seen to be viable to evolve to meet the future need as follows:

- Increasing the capacity of the transfer pipeline and associated pumping assets between Havant Thicket Reservoir and Otterbourne WSW from 75 MI/d to 95 MI/d; and
- Increasing the capacity of the associated Water Recycling Plant (WRP) from 15 MI/d to 25 MI/d (this increase is dependent on the needs of PW as SW’s can be met by a 15MI/d WRP; if PW needs are zero, then the WRP does not need to be expanded).”

“**Option B.5 was seen to be viable to evolve to meet the future need as follows:**

- Increasing the capacity of the transfer pipeline and associated pumping assets between the WRP and Otterbourne WSW from 75 MI/d to 95 MI/d;
- Increasing the capacity of the associated WRP from 75 MI/d to 95 MI/d; and
- Increasing the capacity of the Environmental Buffer Lake at Otterbourne WSW from 75 MI to 95 MI.”

The SW decision to proceed with Option B4 makes no logical sense, why would you not then drop Option B4 and instead pursue Option B5, with a shorter pipeline to Otterbourne from an alternative sewage treatment works with an Environmental Buffer Lake at Otterbourne.

Note: PW can already transfer drinking water from its supply network to SW without the need for the 35km pipe to Otterbourne. Modifications are already underway to enable more water to be shared by upgrading elements of the PW network. This will allow additional water from the reservoir to be supplied to SW to meet the demands of the bulk supply.

Given that Option B5 provides an equivalent solution, with lower long term energy and carbon operating costs, especially as in the short term the volume of water needed from B4 has been massively reduced from 61MI/d to 15MI/d. Why is B5 Peel Common STW with a pipeline to Otterbourne EBL and WTW not selected?

I do not see how SW can justify going on to make the argument for B4 that in the long-term PW 'may' need to make use of the effluent re-use scheme, as if Option B5 were pursued now and developed by SW, then PW could at a later date just negotiate to keep and utilise more of the water from the Havant Thicket Reservoir to meet the PW long-term need, at that time SW could then recycle more effluent and transfer the recycled effluent to the new Environmental Buffer Lake at Otterbourne to meet its needs, as the B5 infrastructure would be in place.

As a matter of urgency SW need to actively progress the actions set out on page 11 of their Gate 2 summary document where it stated;

"The following actions will be carried out to develop the Back-up Option B5 beyond Gate 2:

- Investigate potential for storage at Otterbourne WSW via a new environmental buffer lake.
- Investigate potential alternative routes from the Water Recycling Plant to the Otterbourne environmental buffer lake; and
- Investigate whether additional storage capabilities would provide benefits in a 1-in-500 drought".

Annex 5, Page 138-140 confirmed.

- "Options B.2 and B.5 are assessed to have fewer consenting risks than Options A.1 and A.2, but risks remain in relation to Otterbourne EBL that need to be worked through. **Whilst it should be possible through further assessment and mitigation to avoid adverse effects on integrity of the River Itchen.**
- The Otterbourne EBL has not been subject to a site selection process and this exercise should be undertaken post Gate 2 in parallel to further work in relation to the risks to the River Itchen SAC.
- There are **potential benefits on the water environment associated with B.5 as some flows would be diverted from the Peel Common WTW LSO which is a less well mixed environment than the Eastney LSO**". *Note: The Eastney Long Sea Outfall is also the Budds Farm LSO.*

It seems to me if Option B4 is pursued by SW then the logistics of the long-term operational costs over time are likely to mean that in the end PW customers will end up drinking more recycled effluent from the reservoir, whereas SW customers will receive more drinking water direct from the River Itchen WTW and PW's western chalk aquifer borehole supplies, as there will be less water transport involved to West Hampshire.

This seems like a lose-lose option for PW customers. They lose some of the key benefits of the reservoir, must put up with all the disruption and significant changes to the landscape, then end up being supplied with recycled effluent via the reservoir for drinking water.

2.10 Option B4 was not selected in Southern Waters WRMP19

SW confirmed; The need case for an alternative solution is not beyond challenge because it does not explicitly feature in WRMP19 as being a preferred solution to meeting the agreed supply deficit (SW Annex 3, Page 226)

*SW confirm in various places in the documents; This Option is not part of the long-term scheme for alternative water resources set out in WRMP19. If this Option were selected SW would expect to undertake an update of WRMP19 on the basis of there being a '**material change in circumstances**', so as to include this Option in an updated WRMP19 (Annex 5, page 268).*

You have to ask the question, if this is such a great option, why was it not selected before by the SW WRMP19 option appraisal process. Nothing has changed except that HTR now has planning permission. It was known when WRMP19 was published that PW was applying for planning consent for HTR. **What is the 'material change in circumstances' which justifies this?**

There is a significant concern that local people have not had the same opportunity to comment as other communities impacted by SW options appraisal process, as option B4 has not been selected until the end of Gate 2, with development progressing in Gate 3. The community to be impacted by the desalination plant at Fawley have had years to make representations and raise concerns, such that SW have now withdrawn the proposal. That opportunity has not been afforded to those in the vicinity of the reservoir and B4 infrastructure.

Further public consultation will be required on any revision to the WRMP19 options selection process. This brings the risk of public objection, which is highly likely, especially given the public scepticism about the B4 option and why it has come forward now?

The SW Annex 3 report confirms there is a **risk of a public enquiry** associated with their current strategy.

"Owing to the Selected Option at Gate 2 being shift away from the 'Base Case' included within WRMP19 (desalination at Fawley), in order to support our future planning application, this needs to be reflected in an update of WRMP19 and consultation on our Selected Option is also required. It has been agreed with Defra and the EA that WRMP19 will be updated to reflect our Selected Option through the annual review process, and consultation on the Selected Option will take place via WRMP24. However, Defra has informed SW that it will issue a direction shortly (Dec '21/Jan '22) that will require SW to produce its WRMP24 submission to an expedited timeline (June '22, as compared with standard submission of August '22). Owing to this expedited WRMP24 timeline, there is a risk that the quality of the information provided in WRMP24 will be unsatisfactory, **leading to the potential for public inquiry into our plan**, and delay to scheduling and delivery of our scheme (Annex 3, Page 251).

There must be a significant risk to the reservoir programme of a public enquiry, or appeal process, due to the inadequate consultation with the local community and lack of opportunity to comment on the options appraisal process, due to the very late inclusion of B4 as the preferred option. The presence of SW at stakeholder meetings telling them what they are doing is not genuine consultation.

If Southern Water are genuinely committed to delivering on their environmental obligations in relation to the River Itchen and River Test abstraction reductions, and to reducing the reliance on drought orders for the shortest time possible, by ensuring the reservoir is completed as soon as practically possible, they should reconsider the options appraisal more robustly taking into account all of the issues, impacts and the risks, then not proceed with Option B4 as the preferred option.

Appendix D

Feedback and concerns on other matters related to the SW proposal

1. **Impact on taste & customer acceptability of drinking water**

The change of water source to include recycled effluent risks changing the taste of the final drinking water, this will be particularly true if as expected the risk of eutrophication, stratification and algal blooms increases. The PW Water Quality Manager was previously expressing concern about the risk of changes in taste and how that would be managed when water is taken from the reservoir instead of direct from the existing spring water source when we undertook the original water quality modelling. Then the modelling showed that the risk of eutrophication, stratification and algal blooms was considered to be low. What must the concern be now that effluent recycling is proposed? Consideration needs to be given in the decision making to what impact this will have on PW and SW;

- Customer acceptability? (Even if the water meets regulated drinking water standards will a change in taste raise concerns about the source being recycled effluent and reduce customer's acceptance and consumption of tap water, if so that gives rise to concerns about health and economic impacts if customers feel they must buy bottled water)
- Increased number of complaints?
- Impacts on company performance against ODI and other customer indexes?

Note: Annex 3, Page 53, confirms that the risk of customer acceptance with the change in taste of the water has not been determined.

2. **Impact on Farlington WTW;**

The pre-treatment plant planned at Farlington WTW was designed for treating spring water stored in the reservoir and mixed with ephemeral flows from three small water courses. The previous modelling and treatment appraisal will need to be reviewed by PW/ Atkins to determine the suitability of the method of pre-treatment, size of plant needed and potentially different risks associated with the through put of spring water mixed with variable volumes of recycled effluent.

- Will a larger DAF plant be needed to treat the lower quality water? (more cells/units?)
- Will additional treatment slow the flow through the works?
- A larger plant would have an adverse impact on high quality chalk grassland
- Reduced water quality and risk of algal blooms require extra chemical inputs and waste outputs from DAF plant (extra cost & environmental impact)
- The significant additional environmental impacts need to be considered as a part of a revised EIA including the impacts on; biodiversity, chemical use, energy, carbon, waste generation/ movement and landscape impacts.

3. **Negative impact on ecological value and biodiversity net gain**

a) Loss of seasonally fluctuating water levels

The impact on the wetland and the associated ecology/ biodiversity net gain of the different proposed operational flow regimes in the reservoir has not yet been considered. The ecological benefit of the reservoir and the wetland needs to be the best it can be to deliver the biodiversity net gain needed to compensate for the loss of Ancient Woodland and priority grassland habitats, as committed to in the planning application. This relied on creating **seasonally fluctuating water levels** in the reservoir to create more natural wetland environments, especially for the new marginal habitats in the retained wetland to maximise their value. Under the Southern Water plans this will not happen as they will keep the reservoir topped up all the time with the daily input of recycled water from Budds Farm STW.

The original design ethos for the reservoir and especially the wetlands was for the combination of the evaporation losses in summer and compensation flow discharges (to the stream) to allow the water levels to drop seasonally in the summer, exposing islands in the wetland for nesting birds and creating muddy margins for chicks and returning late summer/ autumn migrants to feed. **It is extremely sad that this opportunity will be lost under the proposed new operating regimes as the reservoir would be kept completely full all the time with recycled water. If the reservoir is full the wetland will also be full as they are in hydraulic connectivity, until water levels drop below the lowest channel height of the wetland retaining structure, separation of the water bodies only occurs during significant drawdown events/ drought situation** In my view this change of flow regime will have a negative effect on biodiversity net gain and is an in-combination negative affect which has not been considered in the Southern Water (SW) assessment to date, as it takes away the opportunity to mirror natural seasonal changes in the reservoir and wetland. The reason it represents a negative in-combination effect is because as a key benefit of the original spring fed reservoir proposal is removed.

I am also concerned that the value of the reservoir as a support site for the coastal SPA will be significantly reduced as the reservoir will be kept topped up, areas of mud will rarely be exposed, except in a drought. The lack of late summer and autumn mud is likely to make the wetland less attractive to migrating wading birds as a feeding area.

SW are trying to sell to the stakeholders that keeping the reservoir fully topped up all the time as a positive benefit. It may be a positive benefit to SW for water supply, but it will have a negative impact on biodiversity as it takes away the opportunity to mirror natural seasonal changes in the reservoir.

b) Impact on nitrate levels in Langstone Harbour

Risks associated with changes in water quality to the compensation discharge from the reservoir and the impact downstream on the streams and Langstone Harbour (SAC, SPA, RAMSAR). The previous spring fed reservoir created a clear benefit (net-gain) in that it would have reduced the level of nitrates going into the harbour. I am concerned that this benefit will be reduced or lost with the water recycling proposal, giving an adverse in-combination impact from the new proposal.

Note: The spring water contains a relatively high concentration of nitrates. Pumping the spring water up to the reservoir instead of it overflowing straight out to sea would have given the nitrates in the spring water time to breakdown in the reservoir, as the reservoir was to be drawn down infrequently, giving a very positive benefit to Langstone Harbour European Protected site and the species that use it. Once again, the concern is not about the recycled water containing very high concentrations of nitrates as the RO treatment process if operated correctly should keep the concentrations relatively low, it is about whether the daily input (or larger volume when pumped in) of small concentrations of nitrate continually input will exceed the rate of natural breakdown causing an overall increase in nitrate concentrations in the reservoir. If so, the benefit to the harbour of reduced nitrates which was to have been delivered via the compensation discharge will be lost. The benefit to the harbour was a key factor in getting Natural England and Environment Agency support for the original spring fed reservoir plans.

4. Loss of an opportunity to create a unique & very special ecosystem

Filling the reservoir predominantly with cool, clear, high quality chalk spring water provided a unique opportunity to create a very special wetland environment with minimal polluting inputs. The previous modelling confirmed that the reservoir would have a low risk of eutrophication, stratification and algal blooms, making it very different to any other lowland reservoirs in southern England fed by rivers. The opportunities that this created in the reservoir and wetland for biodiversity to develop were very special. I am concerned that this

fantastic opportunity to create something unique will be lost if the proposal to pump recycled water into the reservoir is approved, as I fear that the risk of eutrophication, stratification and algal blooms will increase. If so, the biodiversity net gain that the reservoir would have produced will be reduced by the change in water quality from option B4 (effluent recycling), giving an adverse cumulative effect from the SW proposal that has not yet been fully considered because the modelling has not been undertaken.

Note: I supervised the original spring fed reservoir water quality modelling project with the specialist consultants Atkins and was involved in the detail of the sensitivity analysis. Therefore, I know how sensitive the modelling showed the water quality was to tipping the reservoir in to a eutrophic state, with increased risk of algal blooms. The concern is not about the recycled water containing very high concentrations of contaminants like nitrate and phosphate, as the RO treatment process if operated correctly should keep the concentrations relatively low, it is about whether the daily input (or larger volume when pumped in at time of need) will create a tipping point in the trophic status of the water. For example, the original sensitivity analysis showed that the poo from a large black headed gull colony could tip the balance, so it would not take much of change. The key question is will the volume at which low concentrations come into the reservoir be higher than the rate that they would have naturally broken down? Plus, if more nutrients like phosphate settle into the sediment than was originally allowed for what happens if they are remobilised, as that was another concern raised by the previous modelling.

5. Provision of an inbuilt system to top up the water level in the reservoir wetland

With a complete change to the operating regime of the reservoir planned under Option D2 and B4 it will be necessary to review the need for the provision of an inbuilt system to top up the wetland from the main reservoir bowl during drawdown, to protect the biodiversity value of the wetland.

If the reservoir is expected to be drawn down more regularly this will have an adverse impact on the wetland habitat & species, due to the prolonged drying of large areas, especially if the events could take place over consecutive years. PW previously advised regulators and stakeholders that if the water demand was such that there was regular drying of large areas of the wetland they would look to install a system for topping up critical parts of the wetland to protect the ecology. Options that were mentioned in these discussions included installing wind or solar pumps, with pipe work connected into the bowl of the reservoir below the drawdown point, as you need a solution that does not require daily attendance by an operator which would cause disturbance to the wetland.

If regular drawdown is to be a feature of any proposed new operational regime, then an appropriate topping up mechanism should be designed in and installed as part of the initial construction of the reservoir.

6. Impact of treatment failures

SW Annex 3, Page 12 refers to the reservoir being the Environmental Buffer which provides benefits;

- Provides time to respond to potential treatment failures.
- Allows additional opportunity for attenuation of microbial and chemical contaminants.
- In some cases, it helps with public perception.

While this may give increased confidence in terms of a drinking water quality Water Safety Plan approach to address risks to drinking water, it provides an increased environmental risk to the reservoir.

SW has a very poor record in relation to pollution incidents and undertaking the necessary maintenance to prevent incidents occurring at their treatment facilities. As a result public confidence in SW is very low. The fact that Reverse Osmosis is a new technology not currently used widely in the UK on this scale to treat effluent is an added concern, as is the fact that

membranes regularly become fouled and need a high level of maintenance and regular replacement which is costly. There would be an ongoing concern that SW would not invest adequately in the effluent recycling treatment plant to keep it running at its optimum efficiency.

7. Data from the pilot plant at Peel Common STW is not scalable?

SW Annex 3, Page 20, indicated that data from the pilot plant located at Peel Common Sewage Treatment Works (STW) is not scalable. This is a significant concern.

- Does this only apply to the water quality data being obtained?
- Or does it also apply to data on energy requirements, carbon footprint etc.

8. Risks associated with locating the Water Recycling Plant (WRP) at Broadmarsh

SW have noted that the WRP is likely to be located on a landfill site, the location map is redacted. However, from the description it is potentially on the Broadmarsh landfill. If that is the site, I am concerned that they have not understood the significant risk this poses. There does not appear to be any recognition that this was a dilute and disperse municipal landfill site that took domestic, commercial and industrial waste. The landfill has no pollution control measures or gas collection system.

The risks of developing on landfill are set out in SW Annex 3 (2.2.4.6) but do not give any confidence that they understand what they are dealing with. If the proposed location for the WRP is the Broadmarsh landfill the risks need to be taken very seriously.

There is reference in the report to having to seal piles through the landfill lining. There is no landfill lining to seal the piles through. Having been the officer responsible for contaminated land when I worked for Havant Borough Council, I would have serious concerns about any piling taking place through the landfill in this very vulnerable location. There would be a significant concern that any piling through the base of the landfill would open up new pathways by which leachate could reach the chalk aquifer and harbour, especially as groundwater springs are known to be present in the harbour to the south.

Note: When the mudflats of the harbour freeze during extreme weather, they do not freeze adjacent to the Broadmarsh landfill and there has been previous concern that this is because warm gas and leachate from the landfill does disperse below the harbour.

9. High risk of tunnelling / pipeline to and from WRP at Broadmarsh

The potential use of the Broadmarsh landfill as the site for the WRP (if that is the site) also has very significant implication for any future pipeline construction techniques to and from the WRP. There would be a very high risk associated with the mobilisation of landfill gas and leachate within a tunnel or pipeline, or along the substrate below the pipe.

SW Annex 3, Page 33 refers to using Horizontal Directional Drilling as a trenchless technique for construction. Is this practical through a mixed waste gassing landfill material?

10. Information provided by SW is impenetrable to the public & stakeholders

The information shared on the HTR as part of the Gate 2 publications is impenetrable to the general public and stakeholders alike due to;

- The bulk of the key information on the options being redacted, including the figures which should illustrate what is proposed.

- The extensive use of abbreviations in the documents. The key to the abbreviations is provided in a separate document to the Annexes relevant to the HTR and it lists 17 pages of abbreviations.
- The split in information across many different documents, including the key to the abbreviations used.
- The summary report and HTR reports cross reference to further information available in other documents, then those documents are not included in those made available. For example;
Annex 3, Page 48/49 refers to details being in the Technical Documents, no full reference is given and no more detailed technical documents have been provided.
Annex 3, Page 110 refers to a Technical Report giving detail on the HRA but this is not provided.

I have an intimate knowledge of the local area, a familiarity with the Water Resource Management Plan process, 17 years of experience in the water industry, and I found it difficult to find the relevant information to gain even an outline understanding of what is proposed. It took days to read the documents, then when you do find what might be useful information, or a map, it is redacted.

Stakeholders and the public I have spoken to who did try and look at the documents quickly gave up. They need information presented in a more informative, but honest, summary form to be able to comment on what is proposed. Until this is done genuine consultation cannot take place.

Note: I am aware that material within water company documents sometimes needs to be redacted for security reasons, but the level of redaction in these documents makes them meaningless. PW published information on the location of the reservoir pipelines and key infrastructure when consulting on the reservoir proposal, so why can't SW?

11. The Habitats Regulations Screening to date for Options D2 is not robust (also relevant to B4)

The PW data for Bechstein's & Barbastelle bats (Habitats Regulation Annex II species) has not been considered as part of the screening and as a result does not properly assess the impacts (Annex 3, Pg 117).

- The SW text states that there are no Core Sustainment Zones (CSZ) within 3km. That is not correct if they look at the PW data collected for the reservoir site.
Note: For the HTR Natural England required that local SAC's for bats were considered as part of the HRA. This will also need to include an in-combination assessment of the new proposal, with the original reservoir plan and other development sites of which there are many in the area. For example, Dunsbury Park, Land East of Horndean and developments off Long Copse Lane.
- The in-combination effects of the original reservoir option and the D2 option have not been adequately considered.
- It does not appear that the impacts on bats of the ongoing operational use (noise, light) of the High Lift Pumping Station close to Bells Copse have been considered.

12. The Habitats Regulations Screening to date for Options B4 is not robust

A complete review and update of the Habitats Regulation Screening and an Appropriate Assessment will be necessary. The HRA screening for Southern Water's Option B4 is not

robust. In addition to items raised in relation to the screening for Option D2 above the HRA screening for Option B4 also needs to include in the assessment;

- Short and long-term impacts / risks of a raw effluent pipeline below Brockhampton Stream flowing into Langstone Harbour (SAC, SPA, RAMSAR). Annex 3, Pg 175 indicated there was insufficient information to rule out an impact from offshore work. Impacts from a sewage pipe burst in this vulnerable location do not appear to have been considered in the assessment. There is also the question as to how maintenance and repairs will be carried out without having an impact?
- Impacts of the reduced water quality in the compensation discharge resulting from the new filling regime and changes in turnover, on Langstone Harbour (SAC, SPA, RAMSAR). For example, any increase in nitrates, phosphates and risks associated with eutrophication, stratification and algal blooms. As a minimum the screening should have taken a precautionary approach and identified the lack of information as the water quality modelling for the B4 reservoir option has not yet been completed.
Note: The current HRA screening suggests that there is a predicted beneficial effect to the harbour, but that does not take account of the compensation discharge so there is an error in the assessment.
- Impacts and risks associated with making a new connection for waste water into the long sea outfall which is located within a SAC, SPA, RAMSAR.
- Any impacts on the Solent Maritime SAC.
- **Future deterioration in effluent quality over time at Budds Farm STW** as identified in Annex 3, Pg 256 because of increased trade effluent.
- **Concerns about the impact of turbidity issues at Budds Farm** and ??? (Redacted) which lead to issues with final effluent quality. The text in SW Annex 3, Pg 256 confirmed that these need to be considered in future stages of the design process.

13. Biodiversity Net Gain?

Reference is made in the SW documents to providing a biodiversity net gain and a value of 10% is mentioned in association with the options appraisal for B4. However the table in the Gate 2 Havant Thicket document (on page 15) relating to Biodiversity Net Gain is all redacted.

- Why would a table on Biodiversity Net Gain need to be redacted? (just adds to concern that information is being redacted without good reason)
- Biodiversity net gain associated with the existing reservoir proposal cannot be counted as a net gain for the completely separate Option B4 proposal.
- Given the lack of detail available on the project, how have SW assessed that a net gain will be delivered?

14. Unhelpful or meaningless statements

It is not helpful when SW (or PW on their behalf) make unhelpful or meaningless statements in their documents, or when responding to queries by stakeholders, it just undermines the credibility of both organisations. For example;

- In response to an environmental concern about the level of nitrates reaching the harbours, SW confirmed that there would be some nitrates in the recycled effluent discharged into the reservoir, but the level would be considerably lower than the nationally regulated drinking water guidelines of 50mg/l. The drinking water standard has no relevance to the environmental impact of nitrates.
- In another response it was indicated that; following the treatment process the recycled water would contain absolutely no impurities or bacteria, it would be pure H₂O. That is not true and is misleading. For example, SW Annex 3, Page 22 (3) states that the Reverse Osmosis (RO) train is designed to operate at an assumed 82%

recovery. These means that 18% gets through the process (See also TV Appendix B, item 11)

15. Additional community & recreation benefits claimed for Option D2 and B4?

Gate 2 SW HT report, page 10, indicated that Option B4 provides additional community and recreational use. The community and recreational benefits are already being provided by the original reservoir design. There is no information provided on additional facilities to give substance to the claim that additional benefits will be provided.

Page 18 (3.7.2 & 3.7.3) suggests that Option B4 brings extra benefits to Option D2 alone. Again no clarification is provided as to any actual benefits that are being considered in the options appraisal process.

It is not appropriate for SW to claim any benefits for Option D2 or B4 for a reservoir with community, tourism and recreational benefits that are already being provided regardless of these options coming forward. In fact, the impact on recreation, tourism and the community could be negative, especially if the implementation of Option B4 or D2 were to cause an increased risk of algal blooms at the reservoir.

- B4 could result in visual, odour and even health risk impacts.
- D2 could result in more severe drawdown making it a less attractive destination.

SW need to be clear about what the additional benefits are which they are giving weight to in the options appraisal process and ensure that these are agreed with stakeholders. They also need to consider potential negative impacts.

16. Pipeline route options redacted

The pipeline route information is redacted. PW put a lot of work into assessing pipeline route options and dismissed a lot of routes from Bedhampton to HTR as they were not considered practical. The description of the pipeline route is reminiscent of the Park Lane route which was dismissed by PW as not being a practical pipeline route option (Annex 3, Page 50).

I would also be concerned about any route which passed along Swanmore Road/ Calshot Road, especially given the assurances previously given by PW on no construction traffic in this area, the significant change already made to include a southern access, and the other reservoir impacts that residents are already going to have to deal with. This includes pipeline construction traffic for the northern PW pipeline which is now to be directed via Swanmore Road.

17. Control of release of recycled effluent into the reservoir

SW propose that the pumping station for the recycling plant will be controlled by telemetry back to Otterbourne and will be integrated with PW's control system (Annex 3, Pg 41).

Surely any discharge into the reservoir should be controlled through PW's telemetry system as they will be responsible for the reservoir, water quality, any breach of the discharge consent, flood risk, health and safety etc.

18. Location of infrastructure – impossible to assess viability / issues

It is impossible for myself, other stakeholders, or the public, to assess the viability, or identify any issues, or concerns associated with the location of the raw sewage pipeline, Water Recycling Plant, two potential pipeline routes and the High Lift Pumping Station locations because all the maps showing the locations have been redacted. This is a significant concern as SW do not have the same intimate knowledge of these areas that PW, the stakeholders and the public have.

Work to date by SW for Gate 2 is at a high strategic level and is not likely to have picked up all of the issues of concern.

19. Risk associated with invasive species

The original reservoir proposal had an extremely low risk associated with invasive species as the water source was the existing catchment or groundwater spring water. With the addition of recycled effluent the risks associated with the potential introduction of invasive species have to be reconsidered. At present SW only appear to have considered the risk of invasive species such as Japanese knotweed along the pipeline route. At other reservoir sites invasive weeds, freshwater muscels and algae have all caused problems. The invasive species risk assessment should be reviewed.

This should include the risks associated with the reservoir and pipeline, including during emergency drawdown discharge testing, pipeline maintenance, flushing and bursts.

20. Risks associated with public perception

In addition to the concerns I have set out in item 10, SW have identified in Annex 3 a number of risks related to public perception that need to be taken very seriously. **The proposal for effluent recycling via Havant Thicket Reservoir could have a significant adverse impact on the public reaction to reserved matters applications for the reservoir, with a subsequent knock-on effect to the programme for delivery of the reservoir, which is time critical.**

Page 258: There is a risk that key stakeholders closely related to Havant Thicket classic (public, regulators, local authorities, etc.) may be negatively influenced by their perception of Option B4, causing delays or negative impacts to the delivery of the Havant thicket Reservoir and / or associated supporting infrastructure components, causing a negative reputational impact to SW and PW.

Page 260: Owing to the relatively novel technique of Water Recycling and the fact that this water will be placed in a reservoir previously fed by a natural source, there is a risk that public perception is negatively skewed against Water Recycling, leading to delays to during the planning process as the DWI expects public concerns are addressed, as well as reputational impact on PW and SW. (Perception driven by source, odour, hygiene, etc.).