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## Proposed rejection of Beckton sub-option: Beckton to KGV direct pipeline from the London Reuse SRO programme

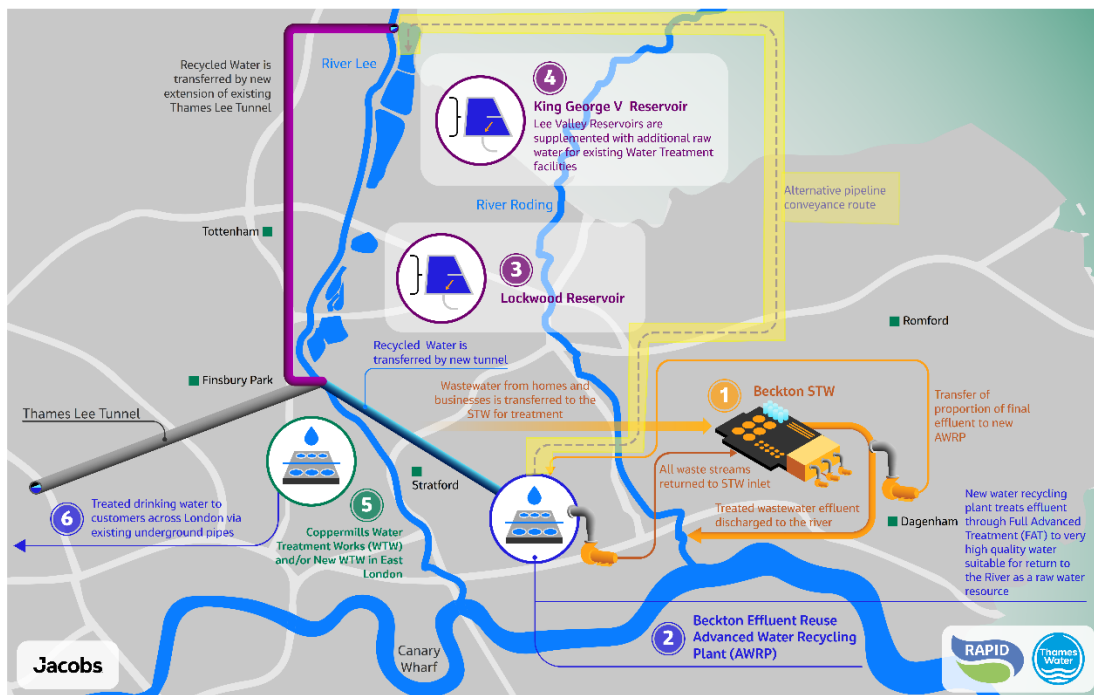
Dear Paul and Margaret

I am writing on behalf of Thames Water's London Reuse SRO regarding the proposed rejection of a Beckton sub-option; the Beckton to KGV direct pipeline from the London Reuse SRO programme.

As part of the London Reuse SRO, the Beckton Reuse scheme currently has two recycled water conveyance sub-options that have been formally submitted to WRSE and RAPID. The two options are:

1. A combination of a tunnel from the proposed Beckton Advanced Water Recycling Plant (AWRP) to Lockwood and a tunnel from Lockwood to the discharge into the River Lee Diversion, upstream of King George V Reservoir (KGV). Capacity of the tunnel would be sufficient to transfer up to 300 MI/d recycled water from Beckton AWRP (and allow transfer of Thames Lee Tunnel (TLT) flows from Lockwood up to KGV).
2. A pipeline option from the Beckton AWRP direct to the discharge into the River Lee Diversion upstream of KGV reservoir for a maximum recycled water transfer of up to 100 MI/d. There is no routing via Lockwood nor the option to provide additional capacity for TLT flows. See highlighted yellow route in the map schematic below.

### Beckton Effluent Reuse Schematic



The direct pipeline conveyance sub-option was introduced at Gate 1 to confirm whether a smaller and potentially cheaper capacity conveyance would make a smaller Beckton Reuse scheme (e.g. sub 100 Ml/d capacity) more cost viable, in comparison to a smaller Beckton Reuse scheme with a tunnel option. This alternative conveyance option was submitted for WRSE regional modelling and to date this modelling has chosen the tunnel conveyance instead of the pipeline conveyance under all scenarios. Therefore, it has been demonstrated that this sub-option is not cost effective when compared to the tunnel.

During Gate 2, engineering and environmental refinements have been carried out to further understand and develop the pipeline sub-option. Material changes have been identified over the last six months that when assessed through the WRMP19 feasibility screening criteria assessment results in the sub-option being deemed not viable on a number of grounds and not a cost-effective solution.

The key changes include:

- Additional planning constraints.

A number of planning conflicts have been identified between the proposed pipeline alignment and existing land uses, along with policy designation conflicts. This results in greater risks and affects the WRMP19 feasibility assessment criteria for: "Planning Policy Designations"; "Land take and land quality"; and "Non-traffic construction impacts". In several key areas it has been identified that trenched construction would not be appropriate due to these land use conflicts, for example:

- a considerable area of former landfill;
- areas of alignment interfacing with major roads and community facilities;
- areas of alignment affecting land in private leisure use;
- interfaces with pre-existing utilities assets and infrastructure;
- physical access concerns;
- conflicts with heritage and biodiversity designations and features, and
- the need to avoid conflict with sensitive uses including cemeteries.

The feasibility assessment criteria for the above three criteria results in a red RAG status. Some elements may be mitigatable through trenchless construction (pipe-jacking) but this then significantly increases the cost of the sub-option further. Some planning conflicts would still remain at intermediate shaft locations required for pipe-jacking and no alternative route corridors have been identified that can avoid all constraints.

- Significantly greater Average Incremental Cost (AIC - £/m<sup>3</sup>).

Through scheme refinement the AIC costs have increased by ca. 30% from Gate 1 and further refinement is likely to increase this further as a result of mitigating a number of the additional planning constraints identified above and considering the operational complexity of a pressurised pipeline.

Our current estimated AIC for the 100 Ml/d pipeline sub-option is £1.8/m<sup>3</sup> (up from £1.4/m<sup>3</sup> at Gate 1) This is significantly higher than for the 300 Ml/d tunnel conveyance sub-option at £1.6/m<sup>3</sup> and would result in a red RAG status scoring for "Normalised Cost/AIC" for the 100 Ml/d pipeline sub-option.

The key elements resulting in increasing costs include; a doubling of the length of pipe-jacking to address additional planning constraints; additional costs for road reinstatement, traffic management, road closures, landscaping and other temporary works; and additional OPEX costs by having a pressurised pipeline compared to a gravity tunnel in consideration of plant restarts and intermittent usage. This requires an addition of a drain-down pumping station and increased operational costs for the complex procedure to drain out the pipeline at every low point between usage out of and in service modes of operation.

- Greater construction complexity.

There is significant engineering complexity involved with the construction of a 32km, 1m diameter pipeline through urban, rural, environmentally-protected and recreational land areas. The pipeline design at Gate 1 was proposed to be largely trenched (open-cut) to save on costs of trenchless pipe-lay, but owing to the increase in trenchless construction combined with some remaining trenched construction in more rural areas the construction complexity has increased. The feasibility assessment criteria for the "Construction Complexity" would result in a red RAG status.

- Environmental mitigation

We have developed a greater understanding of the environmental issues for a pipeline sub-option. Additional mitigation measures, such as changes to the programme, or restrictions on construction activities, may be required when constructing in proximity to the Epping Forest Special Area of Conservation or the Lee Valley Special Protection Area. This has the potential to increase the construction programme of the project and potentially extend the duration of impacts, (although reduce the impacts to interest features of the designated sites) and serve to delay when a scheme could be operational. The feasibility assessment criteria for "Nature Conservation & Biodiversity" would result in a RAG status of amber.

In summary, the key parameters which reduce the viability of the pipeline conveyance sub-option are cost and deliverability risk following further refinement of the scheme sub-option.

The Gate 2 costs have significantly increased for the pipeline option and are expected to continue to rise with further refinement. The WRSE Regional Investment modelling (rev1), based on costs, did not select the pipeline sub-option at any Beckton Reuse scheme size within the planning horizons, it is therefore even less likely that the pipeline sub-option is a feasible option considering the key changes to costs, planning, engineering and environmental criteria identified above.

The pipeline sub-option was added at Gate 1 to ensure a smaller Beckton Reuse scheme (up to 100 Ml/d) was not being rejected solely due to the scale of cost of the tunnel conveyance. The assessments have demonstrated that it is not cost-preferable to the tunnel option, as well as scoring poorly on the other key metrics noted above.

We are therefore seeking agreement to formalise the removal of the Beckton pipeline sub-option from the London Reuse SRO Gate 2 scope based on the reasons enclosed. This would also serve to prevent further unnecessary Gate 2 expenditure progressing a sub-option deemed not viable or cost effective when compared to a tunnel option.

If RAPID agree for this sub-option to be removed all ongoing engineering and environmental work will stop from the date of confirmation. Within our Gate 2 submission we would provide the reasons for rejecting the sub-option.

If you require any further details, please do not hesitate to contact me.

Yours sincerely,

Rob Bromley

London Reuse PM on behalf of Thames Water