Teddington Direct River Abstraction (DRA) Project Market Briefing

Thames Water Utilities Limited

Strategic Resource Options (SRO) Directorate

Contents

1. Introduction

1.1. Purpose of this Document

Thames Water is developing a new Procurement Strategy for the Teddington Direct River Abstraction (DRA) project, valued at circa £301M. The project forms part of the Ofwat PR19 strategic water resource solutions allocation for companies to investigate and develop integrated strategic regional water resource solutions, to be 'construction ready' for the 2025-2030 period, and that protect and enhance the environment and benefit wider society.

Further to the Periodic indicative notice dispatched by Thames Water on 11 December 2023 (ref. 2023/S 000-036442), and the Market Engagement Event hosted on 24 January 2024, this document sets out further background, Thames Water's draft outline Procurement Strategy for the Teddington DRA. Separately, we have prepared a Market Sounding questionnaire to gather market feedback, which can be found by following this link.

The market feedback gained from this consultation exercise is important to the development of an effective Procurement Strategy. All market feedback will be carefully considered and used by Thames Water to inform and further develop its new Procurement Strategy.

In order to analyse the responses, consider the feedback and incorporate suggestions into the ongoing process of developing our Procurement Strategy, we ask that you **complete the Market Sounding Questionnaire by Sunday, 18 February 2024**.

Should you have any queries of comments, please feel free to contact us at SRO.supplychain@thameswater.co.uk.

1.2. Important Notes

This preliminary market consultation relates to the future potential procurement of the Teddington DRA by Thames Water. This briefing and questionnaire are not a call for competition.

Thames Water welcomes feedback from any supplier interested in the Teddington DRA works. Suppliers of any type and size, and irrespective of whether your company has ever supplied Thames Water, are encouraged to consider and engage with this market consultation exercise.

All responses to this market consultation will be carefully considered but will not bind Thames Water to any approach.

Any expenditure, work or effort undertaken by your organisation in relation to this consultation exercise will not be reimbursed by Thames Water.

All aspects of the Teddington DRA Procurement Strategy remain under consideration by Thames Water, and the views of the market will assist in the further development of the strategy.

2. Background

2.1. Teddington DRA Scope and Requirements

The draft Water Resources South East regional plan and Thames Water's revised draft Water Resources Management Plan both include the proposed Teddington DRA project which would supply water to Thames customers during drought conditions. Thames Water is currently developing a design and build Procurement Strategy as part of its preparations for project procurement and delivery.

The project remains in the early stages and is still subject to change. Our dedicated project website provides details about the project.

The requirements to be procured for the Teddington DRA project include three main components shown in Figure 1 and described below.

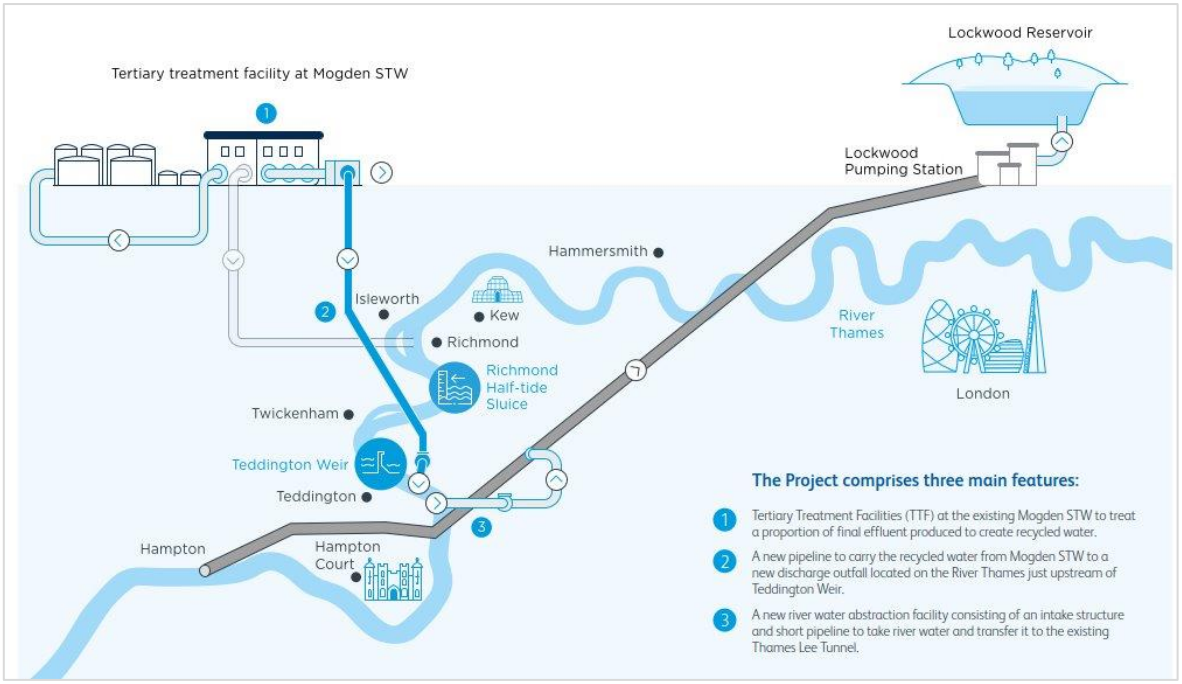

Figure 1 Teddington DRA Works Overview

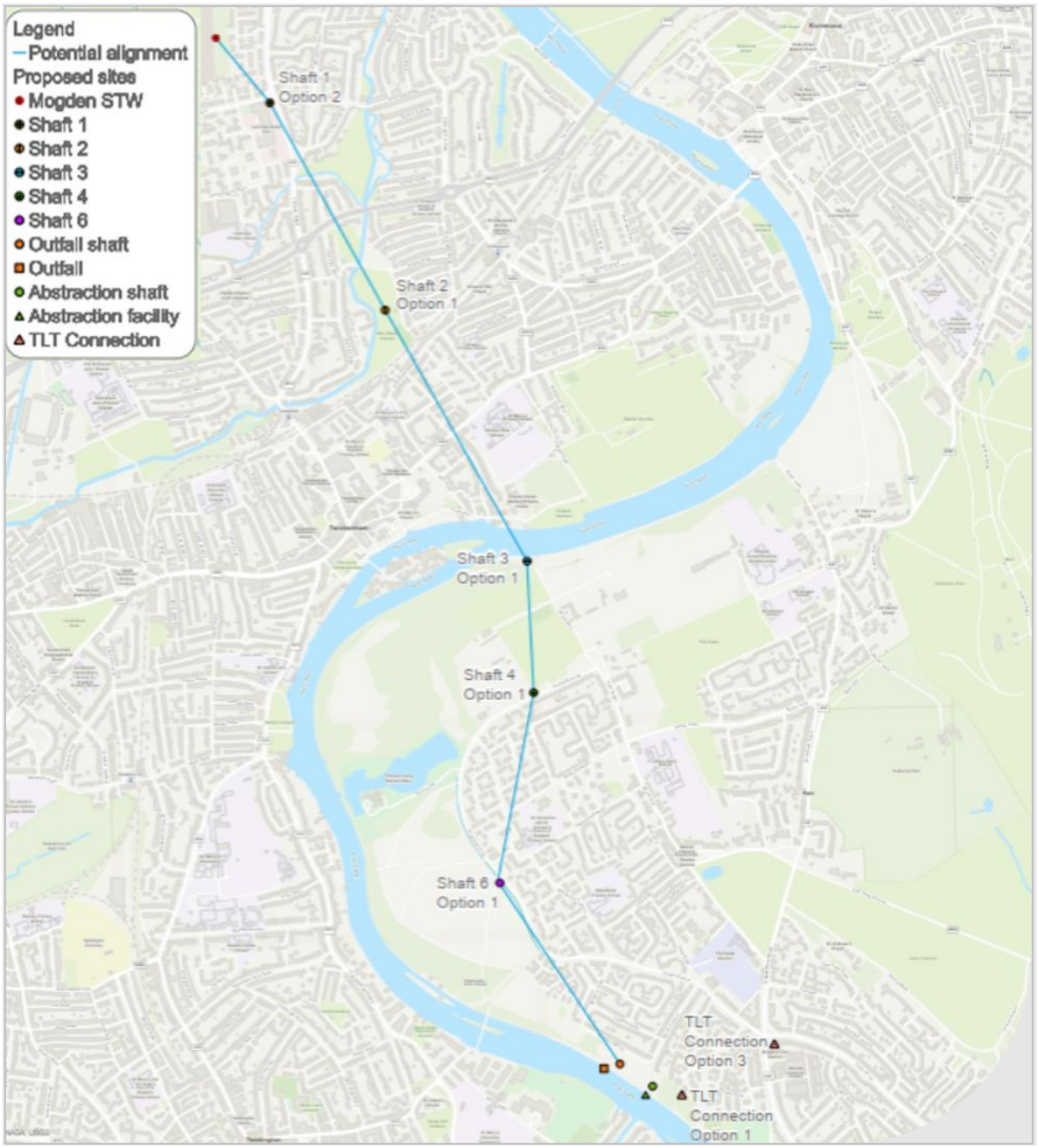

Figure 2 The route and sites shown in the figure is subject to the outcome of the initial site options consultation that closed on 8th December 2023.

The Scope[1] for the Teddington DRA project comprises:

Advance Enabling Works

The requirements for enabling works across the project will vary depending on the detailed design and activities being conducted at each site.

Main Works

The main works comprise three main elements:

[1] The project is subject to ongoing design development, engagement and consultation so some of these elements may change.

1. Tertiary Treatment Facility (TTF)

   The design and construction of a tertiary treatment facility to treat up to 75Ml/d of final effluent. The TTF will be located at Mogden Sewage Treatment Works (STW) and may require construction over or adjacent to existing facilities. Depending on the technology chosen, there may be a requirement for on-going specialist maintenance support or services after the main works are completed.

2. Conveyance and discharge tunnel/pipeline and associated shafts

   There is a conveyance route between the TTF and the proposed outfall south of Ham, above Teddington Weir to accommodate up to 75Ml/d flow of recycled water transfer from the TTF to the Teddington Discharge. This includes:

   i. Approx 4.7km of tunnel with internal diameter of 1.8m, including the provision of tunnelling plant and equipment, logistics and soil disposal.

   ii. Up to 8 shafts between 20-30m deep with an approximate internal diameter of 10.5m

   iii. Construction of an outfall

3. Abstraction facility and connection to the Thames Lee Tunnel (TLT)

   A new abstraction on the River Thames and connection to the existing TLT is proposed c.140m upstream of the outfall. Construction of pipework and the connection to the TLT. Provision of tunnelling plant and equipment, logistics and soil disposal.

The Teddington DRA cost estimate is given in Table 1 (below).

Table 1 Estimated Costs

Category	Description	Value £M*
Main Works	A. Tertiary Treatment Facility (TTF)	139
	B. Conveyance and discharge tunnel and shafts	122
	C. Abstraction and connection to the Thames Lee Tunnel (TLT).	40
	Total	**301**

Source: Thames Water PR24 Submission

Notes:

(1) Costs are for the initial capex cost to develop and deliver the projects.

(2) Costs include risk and optimism bias.

(3) Costs exclude replacement capex and opex.

(4) Costs are based on a 75Ml/d Treatment Plant and tunnels have been sized for this capacity.

2.2. Schedule

The current 'earliest date' programme anticipates that the main milestones for the Teddington DRA project are:

- Approval to Tender Q1 2025
- Contract Notice Q2 2025
- Invitation to Negotiate (ITN) Q4 2025
- Submit Application for Development Consent Q2 2026
- Award Delivery Contract Q1 2027
- Development Consent Order (DCO) Granted Q4 2027
- Start on Site[2] Q1 2029
- Resource Available Q1 2033

The programme has been developed for the purposes of strategy development and market consultation. Milestone dates are dependent on the Water Resources Management Plan, Development Consent Order and RAPID Gated processes (see below). A detailed schedule will be developed as part of the finalisation of the Procurement Strategy.

In 2020, the Environment Agency published the first National Framework for Water Resources. This framework sets out how water companies and other large water users must work together in regional groups to understand and plan for the UK's future water needs whilst protecting the environment. The framework also established the Regulators Alliance for Progressing Infrastructure Development ("RAPID") to oversee regional planning and ensure efficient and effective delivery. RAPID has created a gated process to manage this and ensure companies are making progress on investigation and development of solutions.

2.3. TTF Works Issues and Risks

Ground Conditions

Works at Mogden Tertiary Treatment Facility (TTF) site will be built adjacent to or on top of the existing treatment facilities. The issues and risks associated with unexpected ground conditions and the condition of existing structures on which the new work may be founded will be important in the development of contract conditions which will be acceptable to the market and are discussed below.

The geotechnical risks will be quantified through 2024 by TW into a geotechnical baseline report through an appropriately scoped ground investigation (GI) undertaken to inform the tertiary treatment works design process.

A desk based geotechnical work undertaken for the site has identified the following anticipated risks:

A. Variable ground conditions associated with localised heterogeneity (including anomalous thickening) of Alluvium and River Terrace Deposits overlying the London Clay Formation (LCF).
B. The presence of buried services in the immediate vicinity of the existing treatment facilities.

[2] RAPID definition of "Start on Site" is the commencement of securing the site, beginning site clearance, and enabling works etc.

C. Contamination of the geological sequence overlying the LCF, due to the potential presence of Asbestos Containing Materials (ACMs) in Made Ground, where present, and localised contamination, including coliforms, resulting from Storm Tank leakage.
D. The presence of Unexploded Ordnance (UXO/UXB).

A detail structural condition survey of key existing assets will be undertaken by Thames Water and made available to bidders in the Invitation to Negotiate (ITN) stage.

Ground Investigations

For any future GI works, it is recommended that it shall generally be confined to level ground and no significant issues are anticipated. The exception is the need for vertical and horizontal cores within the eastern embankment of the Mogden Sewage Treatment Works site which will require vegetation clearance and therefore potential risk of localised slope slip; temporary works to eliminate this would be included within the GI Contractor's scope.

Access to all exploratory hole locations and comprehensive buried services information shall be made available to bidders in the Invitation to Negotiate (ITN) stage.

Planning Issues

As previously noted, the project is now deemed to be of national significance. As the Project progresses through its pre application process to application submission in early 2026 we will be continuing with our public consultation programme that seeks to ensure a continuous and open process of engagement with local communities, local authorities and technical stakeholders. We will continue to contact all who have expressed an interest in the Project, as well as all identified statutory consultees, to enable continued participation in future discussions and dialogue.

Thames Water aims to be a good neighbour and recognises there are communities living near the Mogden STW site. As expected, there is a significant amount of interest in any development planned at the site. Any works would need to be carried out in accordance with the Development Consent Order including any mitigation secured to reduce impact on our communities Thames Water supports innovation in the implementation of a Development Consent Order; however, innovations that may require a change to the Order would have to be considered very carefully. Other consents and licences may also be required, and works will need to be carried out in accordance with these.

Stakeholder engagement and environmental input to the design work around potential visual and noise issues are planned by Thames Water to further help mitigate potential programme delays. The bund and vegetation screening around the Mogden STW site along with the appropriate setting and direction of lighting will help to negate potential visual impacts.

Modern well-maintained equipment and controlled working hours may require implementation along with other noise abating measures during construction. Requirements will be incorporated into procurement documents as required. The knowledge of the site and close collaboration working between the design, consents, environmental and stakeholder teams will help mitigate impacts on programme.

Design Approval by the Operator

The Mogden STW site is a Thames Water asset, and the design team is currently actively engaged with the Site and Catchment area leads to ensure the needs of the site and operational interfaces are considered fully in the design without putting additional risk on the operation of the site due to the new TTF. Thames Water will need to agree to the solution developed by its

designers prior to the development consent application and procurement for construction and follow Thames Water's internal governance and assurance processes.

Access Arrangement for Construction

Access to the construction area will be using existing roads on the site. Prior to construction works commencing, a temporary traffic management system will be implemented; this will form part of the enabling works. These works may include the removal of kerbs/pavements and the installation of temporary roads and vehicle waiting areas. Given that the site is currently accessed by HGVs, it is predicted that these works will be minimal.

The Contractor would take over as Temporary Controller of Premises for the actual TTF development whilst facilitating Thames Water Operational access as required for day-to-day operation and any essential or critical maintenance.

Risk of Damage During Construction

Structural surveys shall be completed prior to undertaking any work by Thames Water and information shall be made available to bidders in the Invitation to Negotiate (ITN) stage. A thorough inspection must also be undertaken to verify the performance of the structures and systems prior to any work being undertaken. Following the inspections and surveys, any remedial and/or strengthening work shall be undertaken, as required, to ensure the satisfactory performance of the systems and the safe support of the TTF structure.

Ground-penetrating Radar (GPR) survey shall also be performed by the Contractor during design phase and before excavation to avoid damage of existing underground utilities and facilities.

Should it be deemed necessary, standby equipment and redundancy will be incorporated into the system to ensure safe operation in the event of unintended damage or breakdown. This will include installing double isolations prior to entering tanks. Physical mitigations such as the ability to redirect effluent shall also be reviewed and implemented, as required.

Works shall be planned to be undertaken, where possible, during seasonal windows which allow the system to operate at a reduced capacity. For example, works which require tanks to be taken offline could be undertaken during the spring and summer months. Working constraints will be incorporated into procurement and contract documents as required.

During construction works, any loading by plant, equipment or structures will be managed to ensure it is within allowable limits. Additionally, the construction methodology and site layout will be managed to ensure zones are classified based on their ground-bearing capacity e.g., reduced loading areas over the culvert which runs along the perimeter of the tanks.

3D modelling shall be implemented into the design and planning to help avoid any clashes with existing structures. This will greatly reduce or eliminate the requirement for any unplanned work which may impact the existing structures.

Prior to any asset being returned to operation, they shall be inspected to ensure their condition is satisfactory.

2.4. Shaft Tunnels Issues and Risks

Shaft Construction Works

The shafts need to be constructed first as the Tunnel Boring Machine (TBM) will be launched from a shaft and received at the next shaft. The shafts would be delivered ahead of the TBM launch, which is expected to use one site compound and a team moving from site to site.

Utilities Protection or Diversion

Services information gathering has been undertaken at Gate 1 and Gate 2 stages of the RAPID Gated process, particularly focussing on larger infrastructure, though further, more detailed gathering is required to ensure all services have been identified.

At Teddington it has been identified that there are 33kV cables close to the shafts and at Mogden there are existing rising mains that may need to be relocated.

As part of the early design, the Project Team is discussing relocations with Thames Ops and utility providers.

Mechanical and Electrical Equipment in the Shafts

Mechanical and electrical equipment required in intermediate shafts. For the shafts at Mogden and at Teddington there will be the following:

A. Submersible pumps,
B. Rising main pipework,
C. Fixing steelwork,
D. Platforms and walkways, and
E. Associated cabling.

Highway Improvements to Facilitate Works to the Shaft Construction Sites

Due to the location of the proposed shafts, it is likely that localised highway improvement works will be required to facilitate construction works. It is anticipated that this will be predominantly to enable safe access to the site location using existing roads.

Where sites are located close to busy junctions, it may be necessary to introduce temporary traffic management plans; an example of this is at Site 2 (Ivybridge Retail Park). Additionally, there may be a requirement to strengthen existing road assets; an example of this is the Crane bridge used to access Site 3 which is not currently suitable for HGVs.

Many of the shaft locations are situated in residential areas and the roads leading to them are narrow with street-parked cars. Development Consent Order requirements relating to highways works and mitigation will need to be complied with. Discussions with the local authority will be necessary to devise a strategy for site deliveries; this may require temporary alternative parking to be made available to the residents to clear the roads leading to the sites.

The improvement works will form part of the enabling works and shall be bespoke to each shaft location.

Connection to the Thames Lee Tunnel (TLT)

The Project Team anticipates that the connection to the TLT would be part of the tunnelling contract due to the specialist nature of the works and the interaction between the tunnel and TLT connection.

A main works tunnelling contractor may employ a specialist contractor within its offering for the connection or may have the specialist capabilities in-house.

The TLT connection could potentially be let as an independent contract ahead of the main works contract (tunnelling element). This would be an option should programme and co-ordination of TLT outage for the connection dictate an early start on that element or a client desire to separate that risk from the main works contract.

The existing TLT tunnel is constructed from Donseq wedge block therefore the connection into the TLT needs careful planning. The most suitable connection is likely to be Wedge Block Segment Propping of the existing tunnel to undertake the connection. The type of propping would need to be established. Potentially temporary internal propping or the bolting of segments together may be feasible.

The connection onto the tunnel would be via a drop shaft. This is likely to be a jacked caisson shaft through the competent London Clay. If located offline to the existing TLT, then this gives more flexibility on the location allowing the shaft construction to be kept away from residential properties.

The following stages of design, all within the tunnelling contract, are required to validate the form of connection:

A. Identification of planned shutdowns of the TLT to enable inspections, survey and schedule planning for propping installation.
B. Ground Investigation (GI) desk top study and further supplementary GI recommendation report.
C. Instrumentation and Monitoring (I&M) proposal. A thorough I&M strategy is required to ensure that the Wedge block segments are protected during the works to maintain stability.
D. Full understanding of the operational requirements of the abstraction process, including flow calculations enabling the best tunnel and connection arrangement to be selected.
E. The utilisation of the methods proposed in the Technical Note if utilised should follow industry guidance, which includes the consideration of the following points:
    i. Precedent methods (Refer to Traditional Timbering in Soft Ground Tunnelling – A Historical Review, British Tunnelling Society, C N P Mackenzie BSc (CE) FICE, September 2014). https://britishtunnelling.com/pages/timbering-in-soft-ground
    ii. Mechanise the solution where possible.
    iii. Undertake the detail design in collaboration with miner and engineer to ensure buildability.
    iv. Fully detail and sequence a systematic progression, opening up small areas as work progresses providing adequate support before progressing further.
    v. Breaking up – work to the high point, break up to the roof and then work down.
    vi. Ensure that continuous monitoring, reviewing and reporting is undertaken throughout the project delivery.

<u>Mechanical and Electrical Equipment required in the Tunnels.</u>

There is no M&E equipment required in the tunnel. Periodic condition inspections would be required every 10 years. This would be facilitated by Thames tunnels team with associated temporary access and lighting arrangements brought in.

Risk of Settlement Above the Line of the Tunnel

The proposed route has been selected to limit tunnelling under buildings, especially buildings likely to be piled, to follow highways to limit wayleaves, and passes under greenfield sites to limit issues of potential settlement. Furthermore, the tunnel is expected be situated within the London Clay Formation and it is not envisaged that the tunnel and shaft construction will present any significant risks associated with ground movement.

An initial assessment of settlement has been undertaken at RAPID Gate 2 using high level parameters however this will be developed further.

A first phase settlement analysis will be undertaken at the next stage of design to provide predicted settlements for short term excavation-induced movements, together with identifying all buildings and infrastructure within the likely zone of influence.

Tunnel Diameter

To hydraulically transfer 75MLD, the tunnel diameter required is at least 1.2m.

For a jack length of 1km between shafts the HSE guidance needs a 1.8m diameter tunnel. For diameters below this would need shafts every 300-400m which would be unfeasible due to the urban nature around Twickenham.

The connection from the river to TLT is only a few hundred metres whereas the run from Mogden to river is c. 4.5km with only limited areas where a shaft can be positioned.

To position shafts at more than 1km would require a 3.8m diameter TBM which would greatly reduce the number of shafts but would increase the capital cost and the amount of spoil to handle. However, further work is ongoing to investigate the possibility of using bigger tunnel sizes to limit construction impacts at shaft locations.

3. Draft Outline Procurement Strategy

3.1. Overview

The draft outline Procurement Strategy described in this section is for consultation purposes. It will be further developed with input from stakeholders, including the feedback obtained from this market sounding exercise.

3.2. Packaging Strategy

The main works elements[3] that were considered for packaging are:

A. Tertiary Treatment Facility (TTF).
B. Conveyance/Discharge/Outfall - Shafts 10.5m diameter (20-27m deep) and 1.8m diameter tunnel.
C. Abstraction Pipework/Connection - Shaft 7.5m diameter to connect to the 2.6m diameter TLT (invert 40m) and 1.2m diameter pipe.

From these main works elements, the following packaging options were considered:

Option 1: One Package = [A + B + C]

Option 2: Two Packages = [A] and [B + C]

Option 3: Two Packages = [A + B] and [C]

Option 4: Three Packages = [A] + [B] + [C]

An appraisal of the packaging options 1 to 4 (above) has been undertaken against a range of desired packaging outcomes. For each option, an evaluation of High (H), Medium (M) and Low (L) has been undertaken per packaging outcome. H represents a high likelihood that the desired packaging outcome will be achieved; L represents a low likelihood that the desired packaging outcome will be achieved; and M represents a moderate likelihood that the desired packaging outcome will be achieved.

Thames Water Preferred Packaging Approach

Based on the appraisal in Table 2, Packaging Option 2 is the preferred approach of Thames Water. Option 2 comprises two main works packages as follows:

Work Package 1	Tertiary Treatment Facility (TTF).
Work Package 2	Conveyance, discharge and outfall works, plus the abstraction pipework and connection to the TLT.

[3] The project is subject to ongoing design development, engagement and consultation so some of these elements may change.

Table 2
Packaging Appraisal

Packaging Outcome	Assessment of the Packaging Options Against the Desired Packaging Outcomes							
	Option 1		Option 2		Option 3		Option 4	
Capacity & Capability *The market can deliver the selected type and size of work packages without needing to form bespoke joint ventures.*	L	One large package including different works types would need contractors with different skills, experience and capabilities to work together.	H	This option keeps together works of the same type in two separate packages (TTF and tunnels/shafts), avoiding the need for bespoke joint ventures.	M	One of the packages includes different work types that would need contractors with different skills, experience and capabilities to work together. However, specialist tunnelling contractors can bid for package C, so this approach is considered to be better than Option 1.	H	Separate packages should avoid the need for bespoke JVs and the smaller packages may allow a wider range of tunnelling companies to tender.
Attractiveness *The packaging is attractive to suppliers within the relevant markets and will drive a strong competition.*	L	Packaging together the TTF and tunnelling seems likely to be less attractive contractors that specialise in either type of work, which would reduce attractiveness and may impact on competition.	H	Separate packages for TTF and tunnelling seems likely to be attractive to more of the market for each type of work, which should help to increase competition.	M	Retaining a TTF and tunnelling package seems likely to reduce the attractiveness of that package, although the separate tunnelling package should be attractive.	H	Three separate packages should be highly attractive as it presents the maximum number of opportunities, including two tunnelling contracts.
Ability to Manage *The Thames Water client team can effectively and efficiently procure and manage the number and type of work packages.*	H	There would be one procurement and contract to manage, which strongly supports effective and efficient contract management. However, two key technical requirements will split the focus of the procurement creating some potential issues for effectiveness.	H	Two procurement exercises and contracts to manage, supports effective and efficient procurement and contract management. The focus on the key technical requirements in each procurement will help support the effectiveness of each procurement.	M	Two procurement exercises and contracts, but the procurement of the combined TTF and tunnelling package will split the focus of the procurement.	L	Three procurement exercises and contracts create an unnecessarily high workload in both procurement and contract management.
Interface Complexity *The interfaces (physical, technical, and contractual) between packages that must be managed by Thames Water are simplified*	H	The single contractor will be responsible for managing the physical and technical interfaces (although oversight will be required) and there are no contractual interfaces between main	H	Definition of the key physical and technical interfaces between the TTF and tunnelling packages will need to be clear in the respective contracts. Thames Water will need to be involved the management of the interfaces as	H	The key interface between the TTF and the conveyance tunnelling is included within a single contract package, which provides the benefits of option 1. There is a slight disbenefit as the still could be contractual	M	This option creates the greatest number of physical, technical and contractual interfaces to be managed by Thames Water.

Table 2 Packaging Appraisal								
Packaging Outcome	Assessment of the Packaging Options Against the Desired Packaging Outcomes							
	Option 1		Option 2		Option 3		Option 4	
and risks minimised.		contracts awarded by Thames Water.		the two contracts will have the potential to disrupt one another.		interfaces and the potential for disruption of one contract by another.		
Best in Class *The work packages allow Thames Water to attain the best-in-class skills and expertise to deliver the different elements of the project.*	L	There is a risk with this packaging option that the winning contractor has strong skills and experience in one key technical area, e.g., TTF, but not the other, e.g., tunnelling.	H	Allows the appointment of best in class for the key technical areas of TTF and tunnelling.	M	There is a risk with this packaging option that the winning contractor for the TTF/conveyance tunnelling package has strong skills and experience in one key technical area, e.g., TTF, but not the other, e.g., tunnelling. However, it will allow the appointment of a high-quality tunnelling supplier for the abstraction package.	H	Allows the appointment of best in class for the key technical areas of TTF and tunnelling.
Cost effectiveness *The work packages support cost effectiveness across the project, e.g., site establishment, logistics, productivity, materials purchase, etc.*	H	One contract. Allows the contractor to plan the entire project and optimise site establishment, logistics and materials purchase, etc.	H	Two contracts. Allows each contractor to optimise site establishment, logistics, etc for each key technical requirements, i.e., TTF and tunnelling/shafts.	M	Two contracts. Creates some inefficiencies by dividing responsibility for tunnelling/shafts.	L	Three contracts. Least cost effective as involves three sets of site establishment and the opportunities for planning the project as a whole are diminished.

3.3. Contracting Strategy

Table 3 sets out the Contracting Options considered and discusses the pros and cons of each contracting option as an approach to delivering the Teddington DRA main works.

Thames Water Preferred Contracting Approach

Based on the discussion in Table 3, Pre-Consent Contractor Involvement (Option 3C) is the preferred approach of Thames Water for the following reasons:

A. It involves integrated and collaborative working with all parties incentivised to deliver common objectives.
B. A target cost will be obtained at the tender stage, removing a key risk of two-stage contracts, which is agreeing the target cost.
C. The two-stage contract allows each contractor an opportunity to optimise the delivery plans in the first stage.

D. The approach can be structured to align with Project 13 principles which are considered to represent best practice.
E. The two-stage contract allows the contractors for both packages to look at opportunities for working together to delivery efficiencies and cost savings; and
F. Any efficiencies found in the first stage of the contract would not reduce the target cost but would de-risk delivery and result in both parties sharing any savings that are delivered during the second stage.

In the Pre-Consent Contractor Involvement approach, sufficient design will be completed prior to inviting tenders to support the submission of a tendered target cost.

Table 3
Contracting Options Discussion

Option	Discussion	
	Pros	Cons
1. Traditional works contracting	a) A fully completed design provides a more robust and consistent basis for tender prices. b) The contract can include value engineering clauses to allow the contractor limited scope for improving the design and saving costs. c) Clients may consider it desirable to keep control of the design during the planning and construction stages, but this does result in the risk of the design being less than optimal in terms of value for money. d) The Client's designer would supervise the construction of the works to give the Client a high level of confidence in the quality of the built works.	a) Historically, tender prices have not provided a reliable estimate of the outturn cost, particularly when there is a focus on the lowest price for tender award. b) The opportunity for early contractor input into the design and scope for innovation is largely lost. c) The late appointment of the contractor restricts the time available for resource planning, risk planning, stakeholder engagement, mobilisation, etc. d) The client normally has to provide substantial resources for supervision of the works to ensure compliance with the design. e) The traditional approach fell into disrepute in the mid-1990's due to the very adversarial approach and substantial cost and time overruns that occurred on many contracts.
2. Traditional design and build	a) Design responsibility would transfer from the Client to the Contractor at planning approval stage or thereabouts allowing the Contractor some input into the final detailed design with some scope for innovation and efficiencies. There is more potential than the traditional works contractor approach for contractor input. b) Client requires less resource for supervision during construction. c) Contractor has an ongoing incentive to find better ways of improving the design and delivering the works. d) D&B approach normally achieves better price and time certainty than traditional works contracting.	a) Contractor appointed too late to input into the design for planning approval purposes. Lost opportunity for innovation, buildability and efficiencies. b) Transfer of design responsibility requires allowance for due diligence or the Client carrying the risk of any errors. c) Client design changes during construction can result in substantial costs and delays. d) The robustness of the Contractor's quality procedures can be threatened by commercial pressures. The level of supervision is not normally under the Client's control.
3A. Early Contractor Involvement **(with contractor**	a) It focusses the delivery team on the Client's objectives from the outset, including requirements, time and budget. Delivery within budget can be a key incentive.	a) The early appointment would not allow the submission of a price at the tender stage. There is a risk that a lack of competitive tension during the first phase of the ECI contract may result in target price proposals that are not

Table 3
Contracting Options Discussion

Option	Discussion	
	Pros	Cons
design responsibility)	b) A dedicated construction planning and design stage allows the Contractor more time to plan the delivery of the Client's key objectives. c) Creates opportunities to integrate design and construction planning to optimise buildability. d) Allows substantially more time to identify, avoid or manage construction risks. e) Provides more time for the proposed construction methodologies, programme and cost estimate to be reviewed and tested before construction. f) Helps to remove procurement from the critical path by procuring in parallel with other project activities. g) Contractor can explain how the works will be constructed at the planning stage.	acceptable to the Client (although various processes can be developed to reduce this risk). b) Any incentive to deliver within budget is undermined if the Client's budget is insufficient to deliver the works. c) Relies on close, collaborative working, which is not suited to some clients or contractors. d) The contractor's designer may not be the best in class for leading through the planning process (award processes tend to focus most on the contractor). e) Less Client control over the development of the design. f) The robustness of the Contractor's quality procedures can be threatened by commercial pressures. The level of supervision is not normally under the Client's control.
3B. Early Contractor Involvement **(with Thames Water having design responsibility)**	As 3A except: a) A separate Thames Water designer in the planning stage more easily allows multiple contract packages as Thames Water's single designer will lead through the planning process.	As 3A except: a) A separate Thames Water designer reduces the opportunities to integrate design and construction planning. b) Time required for handover a design to the ECI contractor at the end of ECI stage one and risk of errors being found.
3C. Pre-Consent Contractor Involvement **(with contractor design responsibility)**	As 3A except: a) Later involvement of the Contractor allows the planning approval to be completed by Thames Water and the requirements to be sufficiently fixed for a target price to be tendered. Significantly reducing the risk of failing to agree the target price at the end of the first stage of ECI. b) The first stage of the contract is shorter than normal ECI methods but still provides the opportunity for the Contractor and the supply chain to contribute ideas for better value designs and ways of working to reduce costs and carbon.	As 3A except: a) Later appointment reduces some of the ECI benefits by reducing the time available for the contractor to plan construction, integrate design and construction, and identify and mitigate or manage risks.
4. Management Contractor	Note: This is similar to the traditional main works contractor approach, but the Management Contractor would procure nearly all of the requirements from the supply chain. a) Works contracts would be between the suppliers and the Management Contractor meaning that the Client does	a) There can be limited competition for projects delivered using this approach due to the limited opportunity to undertake construction work themselves. b) Smaller suppliers in the supply chain can be reluctant to work in direct contracts to a Management Contractor due to concerns about fair and prompt payment.

Table 3
Contracting Options Discussion

Option	Discussion	
	Pros	Cons
	not have to resource the procurement procedures. b) The Management Contractor may be able to use its leverage as a major contractor with long-term supply chain arrangements to get better value for money. c) Value for money is demonstrated by the Management Contractor being required to appoint works contractors through competitive procedures. The Management Contractor can be allowed to undertake some works subject to demonstrating value for money. d) Design is normally undertaken by the Client's designer, but the work is coordinated and managed by the Management Contractor who can also provide contractor input into the buildability of the design and value engineering ideas. e) Construction can commence before the design is complete leading to programme savings.	c) The management fee charged by Management Contractors can be high compared to fees charged under other approaches. d) There can be problems with the resolution of disputes (the Client does not have a clear route to pursuing damages with subcontractors) as a Management Contractor operating on a cost-plus fee arrangement may have difficulty in demonstrating losses if a subcontractor fails to perform. e) The ability to start construction before the design is fully complete can lead to abortive works and extra costs if the Client decides to make changes as the design is finalised. f) The Client may wish to retain overall responsibility for stakeholder engagement which can result in unclear liability where changes become necessary to design or working methods.
5. Construction Management	a) Allows the Client to have direct contracts with best-in-class specialists rather than an indirect sub-contract with a supplier selected by the main contractor. b) Reduces 'fee-on-fee' costs in the supply chain. c) Greater opportunity for specialists to input innovation into the design, planning and construction methods. d) Allows construction to commence before design is fully complete. e) The Client appoints a competent Construction Manager who should be able to provide all the resources needed for programme management, project controls, contract management etc. f) Construction management tends to minimise conflicts and disputes without resorting to formal legal processes. g) Suppliers are paid more promptly direct by the Client making it less likely that a key supplier will suffer financial collapse.	a) Specialist contractors not always geared up to resource large tendering opportunities. b) Specialist divisions of larger main contractors often win tenders due to access to greater resources. c) Specialists do not always have the systems and experienced resources to act as a lead contractor. d) Construction management works better when there is a long-term programme of work, rather than an individual project, allowing long-term relationships to be developed. e) Smaller companies will have more difficulty in accepting contractual risks due to the potential financial exposure. f) Performance failure by a single key specialist could undermine the contract programme and seriously impact adversely on the work of other specialists. g) Requires a high number of public procurement exercises (although the construction manager can provide resources to help).
6. Alliance Models	a) Successful alliances have delivered successful outcomes for clients based on strong collaborative working with common and incentivised objectives. They are in line with latest best practice advice such as Project 13.	a) Alliance models and contracts tend to be quite complex and can be difficult for Clients to adopt due to their normal governance arrangements. b) There are standard industry contracts for alliance models such as the NEC4 Alliance Contract but in practice there

Table 3 Contracting Options Discussion		
Option	Discussion	
	Pros	Cons
	b) Alliance arrangements incentivise all parties to contribute ideas to deliver better value solutions.	are limited examples of their use in practice. c) The procurement of alliance partners can be more complex for Clients. They have to decide whether to procure the different partners required and then bring them together in an alliance, or to leave the formation of alliances to the market with the client procuring a pre-formed alliance. d) In a true alliance all project decisions would be taken jointly by the alliance, but in practice the Client's governance arrangements would require it to have the final decision on matters such as budgets and technical standards. e) The Client may not have appropriately experienced resources available to act as its representatives within an alliance. Training and/or recruitment could resolve this but there would be a risk that the alliance would not be well served by inappropriate or inadequate client resources.
7. Engineering, procurement, and construction (EPC) contracts	a) EPC approaches can be good where clear outcomes can be specified and the EPC Co can be given a free hand to go away and deliver with minimal oversight by the Client. b) The procurement should produce a robust fixed price albeit it will contain a high risk-premium to cover the risks carried by the EPC Co.	a) The approach is less suitable when the Client needs to keep control of the design for the purposes of planning approval and stakeholder requirements. b) The approach may carry greater certainty of price but not necessarily better value for money due to the risk premiums required by the EPC Co to cover the risks transferred by the Client. c) The Client will have less control of the development and delivery of the project. If it wishes to intervene and make changes to requirements or to give instructions that affect the approach being taken, then it can expect to pay significantly greater costs.

3.4. Contract Form

Thames Water is keen to use a contract form that is recommended by the Construction Playbook and to ensure that the contract facilitates an allocation of risk that is perceived by the market to be fair and is sufficiently attractive to generate strong competition among the best companies.

Preferred approach to Contract Form

The NEC 4 Option C approach is proposed for each contract package. This will result in a shared risk approach (with both parties sharing savings and cost overruns). The NEC4 will also help to support:

- a strong level of competition by being attractive to the market and the best suppliers.

- a fair allocation of risk to support best value.
- terms and conditions that are familiar and acceptable to the market.
- collaborative working relationships between the parties.
- incentivised delivery of the client's objectives; and
- efficient contract administration, and dispute avoidance.

An incentivised performance management approach is being considered by Thames Water to incentivise the delivery of key Government, Corporate and Project objectives. It is also proposed that the use of X12 Multiparty Collaboration will be developed to allow joint incentivisation of the main contractors.

3.5. Procurement Route

Thames Water's preference is to procure the main works packages using a competitive procedure, as per the Procurement Act 2023. This procurement route will introduce some flexibility on the terms that can be agreed by Thames Water.

At the tender stage, a minimum Quality/Price ratio of 70/30 is preferred by Thames Water. Quality factors that Thames Water will be interested in are:

- collaboration,
- innovation,
- productivity,
- net-zero / carbon and sustainability,
- social value, and
- health and safety excellence.

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