London Water Recycling Strategic Resource Option Site Appraisal Methodology

October 2023

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1. Introduction

1.1 This document sets out the methodology to be used to appraise potential sites for the delivery of infrastructure associated with Thames Water's (TW) London Water Recycling (LWR) Strategic Resource Options (SROs) and their associated conveyance routes (tunnel or pipeline).

1.2 This methodology document is structured as follows:

- Section 2 provides an overview of the appraisal methodology and identifies any key definitions or limitations
- Section 3 provides further detail relating to Stage 1 of the appraisal process: identification of the LWR SRO schemes via Water Resource Management Plan 2019 (WRMP19) and Regulators' Alliance for Progressing Infrastructure Development (RAPID) Gate 1
- Section 4 provides further detail relating to Stage 2 of the appraisal process: Preliminary Appraisal of the WRMP19 / RAPID Gate 1 sites and alignments for each LWR SRO scheme
- Section 5 provides further detail relating to Stage 3 of the appraisal process: Agreement of shortlisted sites (workshop) for each LWR SRO scheme being appraised
- Section 6 provides further detail relating to Stage 4 of the appraisal process: Detailed appraisal of sites for each LWR SRO scheme
- Section 7 provides further detail relating to Stage 5 of the appraisal process in respect of consideration (workshop), reporting and consultation upon the outcomes for each LWR SRO scheme that has been appraised.

2. Overview of Appraisal Methodology

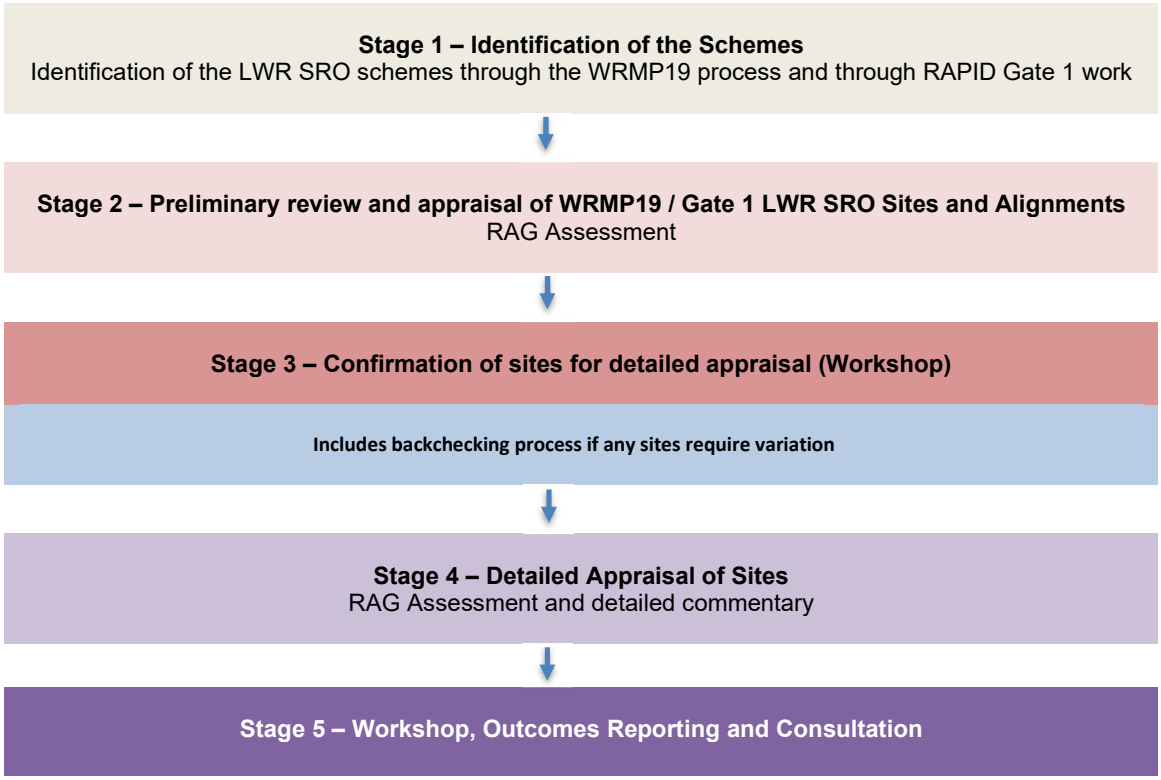
2.1 The purpose of this appraisal methodology is to consider the engineering, environment, planning and land assembly opportunities and constraints associated with all potential sites and, where applicable, their route corridors, for any given LWR SRO scheme.

2.2 This methodology has been prepared by a multi-disciplinary team comprised of project managers, engineers, environmental assessors, town planners, property consultants and transport consultants engaged by TW to support the concept design and appraisal work associated with progressing the LWR SROs through the RAPID gated process [1].

2.3 Whilst the methodology, its stages and the criteria that it addresses will share similarities with other SROs being progressed, both by TW and by other water companies, the method that is described in this report is specific to the characteristics of the LWR SRO schemes and so it will also contain measures and criteria that are not shared with or that are otherwise different to those contained in the site appraisal methodologies for other non-LWR SROs. This methodology is therefore specifically aimed at addressing the range of criteria identified by each disciplinary team as being of relevance to the progression of any of the potential LWR SRO schemes in their London contexts.

2.4 Figure 1 summarises the methodology that would be applied to each individual LWR SRO scheme.

Figure 1 Appraisal Methodology



2.5 To aid understanding of key terms and features to which repeated reference will be made throughout the appraisal process, the following definitions should be borne in mind. As the appraisal progresses the definitions will be kept under review.

[1] Regulatory Alliance for Progressing Infrastructure Development (RAPID) (https://www.ofwat.gov.uk/regulated-companies/rapid/)

Table 1 LWR Definitions

Item	Definition
Advanced Water Recycling Plant (AWRP)	A site containing plant and equipment used to filter and fully treat already treated effluent to make it ready for conveyance and discharge into clean water supply
Tertiary Treatment Facility (TTF)	An additional, final stage of the waste water treatment plant process. It uses physical and chemical methods to remove contaminants from final effluent
Pumping Station	A site containing pumps to transfer water through tunnels and / or pipelines
Screens	Equipment used to remove material within the water that might otherwise block recycling processes and to protect fish and other wildlife.
Discharge structure (outfall)	A site comprised of pipework interfacing with a receiving water course into which transferred flows can be discharged.
Abstraction structure (intake)	A site comprised of an inlet into which pre-determined rates of flow can be abstracted and directed to a recipient pipeline for onwards transfer
Tunnel	A below ground tunnel system used to convey raw or treated water constructed using a Tunnel Boring Machine (TBM) or other appropriate methods.
Drive shaft	A vertical below ground shaft from which a tunnel boring machine or pipejack machine is launched at the required depth to cut and construct a tunnel or pipeline
Intermediate shaft	Vertical below ground shafts along a tunnel or pipeline corridor route installed to provide construction or operational access, maintain health and safety protocols, and / or allow for air flow management.
Reception shaft	A vertical below ground shaft representing the terminus of a tunnel or pipeline and from which the associated tunnel boring or pipejack machine is removed
Pipeline	A (normally) below ground pipeline used to transfer raw or treated water, typical constructed by excavating into the ground, laying pipes and backfilling.
Trench	A shallow excavated cut into ground from surface level within which a pipeline can be laid
Trenchless / Pipejack	A section of buried pipeline delivered between two shafts cut to an appropriate depth. Sections typically constructed using pipejacking which is a tunnelling technique (see below).
Pipejacking	Technique for installing underground pipes, ducts and culverts by launching and pushing a pipe through the ground between two shafts.
Site (Infrastructure)	A location containing permanent above or below ground buildings, plant or equipment
Site (construction)	A location to be used temporarily during the construction of the permanent infrastructure.
Route alignment	Land identified for appraisal for its potential use as the alignment of a tunnel or pipeline

Limitations

2.6 Within any appraisal or assessment there will be limitations that affect the ability to identify all key issues or to draw full conclusions regarding the appropriateness or impact of a particular option under consideration.

2.7 The initial limitations associated with the LWR appraisal process are set out in Table 2 below. These will be reviewed and updated as the work is undertaken.

Table 2 LWR Appraisal Limitations

Item	Explanation	Action
Ancient Woodland	Only areas of ancient woodland above 1ha are reliably mapped. Areas of ancient woodland below 1ha will need to be identified through subsequent detailed survey.	By retaining alignment flexibility, particularly for trench or shallow trenchless routes, this reduces the risk of a <1ha area of ancient woodland subsequently 'blocking' a route corridor.
Veteran Trees	The potential for impacts on Veteran Trees is not considered at pipeline corridor stage	By retaining alignment flexibility, particularly for trench or shallow trenchless routes, this maintains the ability to avoid impacts on veteran trees in later more detailed feasibility work.
Deep ground contamination	Parts of the identified route corridors are known or suspected to pass through areas of previous heavy contamination, for example industrial use, gas works and landfills. Exact location and depth information on such contamination may not be available to the appraisal.	Desk based survey to be combined with site visits to establish location of suspected contaminated sites. Decisions on method of construction to retain flexibility as appraisal stages progress.
Below ground engineering, development, utilities and assets	Parts of the identified route corridors will encounter interfaces with known or suspected below ground engineering, development, utilities and assets. The exact location and depth information on such features may not be available to the appraisal.	Desk based survey to be combined with site visits to establish location of potential features. Decisions on method of construction or approaches for avoidance to retain flexibility as appraisal stages progress.
GIS datasets	Designation locations have been identified following a review of datasets produced and released in 2021. These datasets will change over time.	Each appraisal will seek to ensure any GIS or similar datasets are kept up to date.

2.8 The Stages of the appraisal process are explained in more detail in sections 3 to 7 of this report.

3. Stage 1: Identification of LWR SRO Schemes for Appraisal

3.1 **Stage 1** is represented by work undertaken through TW's WRMP19 and more recently as part of Gate 1 of the RAPID gated process for the LWR SRO.

3.2 WRMP19 and RAPID Gate 1 work established four potential schemes for the recycling of treated effluent to aid the development of drought resilience in London's drinking water supply system. In particular, as part of the RAPID Gate 1 process, sites and potential alignments were identified using an initial desk based assessment of designations and constraints for each discipline (engineering, environmental, planning and property).

3.3 The locations of the intake and outfalls associated with those initial schemes was driven by the need to be connected to existing TW wastewater treatment assets, to connect into existing water storage, treatment and supply infrastructure, and to be able to maximise resilience across the wider TW network. As part of identifying the key infrastructure and sites for each scheme at Gate 1 the associated hydrodynamic effects of the intake and outfall locations for each were modelled, including through consultation with the Environment Agency, in order to refine the locations and minimise environmental impacts.

3.4 In particular, the Gate 1 outcomes explored further the initial concepts for all identified LWR schemes, including their key start and end points, and potential means of conveyance from point to point, to identify via engineering feasibility testing, strategic environmental assessment, planning consent review, programme testing and key stakeholder dialogue the potential concept designs and options.

3.5 These were verified through the Gate 1 process for feasibility and confirmed for further investigation under Gate 2 of the RAPID process and beyond, where appropriate.

3.6 As shown on Figure 2 below, the schemes that made up the London Water Recycling SRO as considered under RAPID Gate 1 included:

- Beckton Water Recycling
- Mogden Water Recycling
- Mogden South Sewer STW and Recycling
- Teddington Direct River Abstraction (DRA)

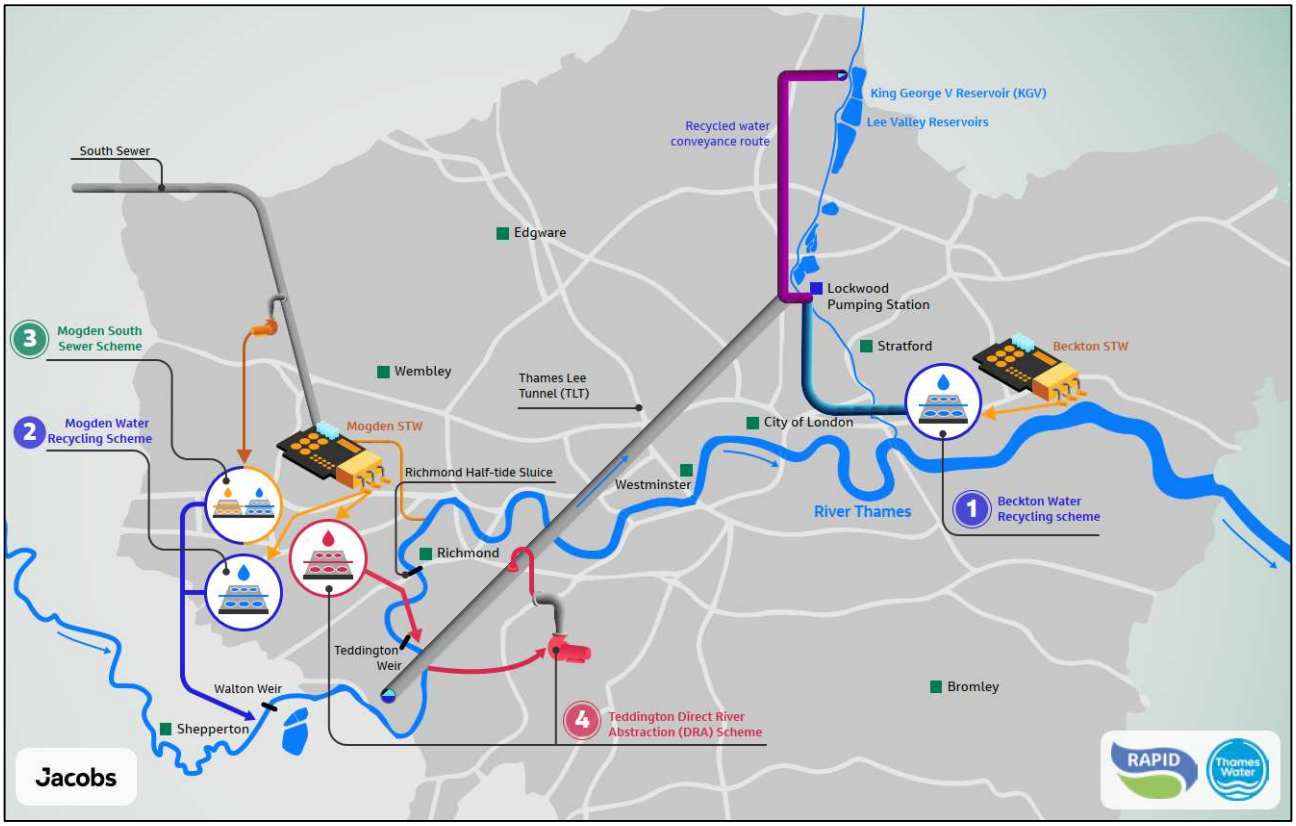
3.7 **Beckton Water Recycling scheme:** Final effluent from the Beckton Sewage Treatment Works (STW) in East London would be treated at a new AWRP within the Beckton site boundary. The recycled water would then be pumped via a conveyance tunnel to a proposed discharge location on the River Lee Diversion above the inlet for King George V (KGV) Reservoir to supplement the raw water supply to the Lee Valley reservoirs.

3.8 **Mogden Water Recycling scheme:** Final effluent from Mogden STW would be pumped to a new AWRP located at a suitable site near to Kempton Water Treatment Works (WTW). The recycled water would be discharged into the River Thames upstream of the existing TW Walton intake.

3.9 **Mogden South Sewer STW and Recycling**: Untreated sewage would be sourced from within the Mogden South Sewer and diverted for wastewater treatment in a new sewage treatment plant to be sited alongside a new AWRP. Full recycled flows would then be transferred to the River Thames and all waste outputs requiring further treatment transferred to Mogden STW.

3.10 **Teddington DRA:** A proportion of Mogden STW final effluent would be subject to an additional 'tertiary' stage of treatment at a new plant on the STW site. The recycled water would be transferred to a discharge location on the River Thames upstream of Teddington Weir and would directly compensate flows taken from a new abstraction on the River Thames, upstream from the discharge. The abstracted water would be pumped into the nearby Thames Lee Tunnel (TLT) for transfer to the Lee Valley reservoirs.

Figure 2 London Water Recycling SRO Gate 1 Schemes



4. Stage 2: Preliminary Appraisal

4.1 **Stage 2** builds on Stage 1 by subjecting each of the RAPID Gate 1 LWR SRO schemes to a site level preliminary appraisal utilising core engineering, environmental, planning and property criteria to indicate whether potential site areas identified at Stage 1 should be retained, revised or removed, and whether the interconnecting conveyance routes for each scheme should be retained, revised or removed.

4.2 Stage 2 focusses on criteria drawn from overarching national policy objectives or derived from engineering requirements and known environmental limitations that could inform the design and deliverability of each LWR SRO scheme.

4.3 Whilst each scheme is technically different, they are all situated in very similar predominantly heavily developed urban areas within Greater London. At the same time, each scheme relies upon an ability to be delivered between certain predetermined fixed locations that limit the degree to which conveyance routes and associated development sites can be identified. Further detail is provided on each scheme below.

Beckton Water Recycling

4.4 Development must start at Beckton STW where treated effluent is to be intercepted for further treatment via a new AWRP within the STW prior to conveyance off site.

4.5 Conveyance will be routed from Beckton and connect with Lockwood Reservoir and Pumping Station in the Lee Valley via a conveyance bore.

4.6 Conveyance route to be completed from Lockwood Reservoir and Pumping Station to KGV storage reservoir via a discharge outfall to the River Lee upstream of an existing abstraction intake feeding the KGV reservoir.

4.7 A further Gate 1 option for Beckton Water Recycling utilising a pipeline (for a 100ml/d scheme) was removed from ongoing appraisal during Stage 2. Initial work during Gate 2 identified that a route via a pipeline would not be favourable due to the need for a substantial amount of that alignment to be constructed via pipejacking to avoid identified surface constraints and land uses (e.g. cemeteries, registered parks and gardens, complex road junctions, areas of nature conservation interest, former waste facilities, areas of built urban development and existing buildings) resulting in no cost benefits when compared to a larger tunnel option (for a scheme up to 300ml/d).

4.8 Accordingly, and following discussions with RAPID[2], this alternative pipejack option for Beckton Water Recycling was removed from further consideration, leaving only a tunnel option for further development.

Mogden Water Recycling

4.9 Development must start at Mogden STW where treated effluent is to be intercepted for conveyance and further treatment off site. In turn the conveyance must interface with a suitable site for the provision of a new AWRP and must terminate via a discharge to the River Thames at or in the vicinity of Walton Bridge to ensure flows are blended in the reach of the river between Sunbury and Shepperton to be upstream of the abstraction for Walton. This allows the recycled water to be available for abstraction at Walton for storage or direct feed to Walton WTW and at Hampton for intake to the TLT.

4.10 There were several different outfall site locations taken into consideration throughout the optioneering stage which factored in environmental, planning and engineering parameters. The environmental requirements included sufficient distance from the intake, and the river depth to ensure required level

[2] Letter-from-RAPID to TW-20-May_2022.pdf (ofwat.gov.uk)

of recycled water blend and dilution in the river. The engineering and planning requirements included availability of land suitable for a planning application, as well as construction requirements such as connection to the conveyance, sufficient land area, geometry, and access to site.

Mogden South Sewer STW and Recycling

4.11 Development must start at the South Sewer near Kempton Park WTW where a portion of untreated sewage would be abstracted and would be pumped to a new AWRP located near Kempton WTW. The internal diameter of the new pipeline would be 800mm with an approximate length of 1.8km.

4.12 As a result of treatment processes at the new AWRP, the Recycled Water would then be pumped by pipeline and discharged into the River Thames upstream of the existing Thames Water Walton WTW intake. The internal diameter of the new pipeline would be 700mm with an approximate length of 5.9km.

4.13 The waste stream from Reverse Osmosis (RO) concentrate from the AWRP treatment would be transferred to the existing Mogden STW outfall via a new 355mm internal diameter pipeline with an approximate length of 6.4km.

4.14 The waste stream return from the AWRP treatment process would be pumped to the South Sewer which discharges into Mogden STW inlet works. The internal diameter of this pipeline would be 100mm and an approximate length of 1.8km.

4.15 The Mogden South Sewer scheme was developed throughout Gate 1 and during part of Gate 2 in 2022, during which it was removed from further consideration. The scheme was not progressed further as it was established through sewer flow monitoring and evaluation that the dry weather flow in the South Sewer ranged between 33 and 36 Ml/d. This flow is substantially below the flow required to support a 50Ml/d scheme and would only have supported a significantly reduced capacity falling below the threshold for the SRO programme and required deployable output.

Teddington DRA

4.16 Development must start at Mogden STW where treated effluent is to be intercepted for further treatment via a new Tertiary Treatment Facility (TTF) within the STW, prior to conveyance off site.

4.17 Conveyance must terminate via a discharge to the River Thames, at or in the vicinity of, Teddington Weir and Lock to ensure the any flows abstracted from the river into the TLT are compensated in close proximity to the flow from Mogden. The TLT crosses under the River Thames at this point.

4.18 Abstraction must take place within close proximity of the potential area of discharge to ensure there is no detriment to the River Thames by depletion of flows in the gap between intake and discharge, and to keep within acceptable parameters, any effect on temperature and ecological impacts.

4.19 Conveyance of abstracted flows must terminate at and connect into the nearest available and acceptable site for connection to the TLT raw water main (to enable conveyance of abstracted flows to the River Lee Valley storage reservoir system). As the TLT is a critical element of London water resourcing the connection design is a critical element of the project.

4.20 The LWR SRO schemes to be individually subjected to the appraisal process are:

1. Beckton LWR SRO Scheme:
    - Beckton water recycling (AWRP) – tunnelled option
2. Mogden LWR SRO Scheme:
    - Mogden water recycling (AWRP) – twin pipeline / tunnel option
3. Teddington LWR SRO Scheme:
    - Teddington DRA (TTF) – pipeline option

4.21 Application of the appraisal methodology to each of the schemes is intended to identify within each scheme the most appropriate combination of sites and conveyance routes that would enable that scheme to progress as a viable development proposal.

4.22 The methodology, the appraisal process and its outcomes are not intended to enable a comparison to be made between each of the schemes, or to infer that this methodology aims to undertake such a comparison. Importantly, that none of the schemes is intended to be viewed through the appraisal as representing an alternative to those others under consideration.

4.23 Selection of a particular scheme for progression, subject to ongoing evidence of its viability and feasibility, is driven by water supply and management modelling, undertaken to inform the Water Resources South East (WRSE) Regional Plan, and Thames Water's Water Resources Management Plan 24 (WRMP24).

4.24 In particular, both the revised Regional Plan and the revised draft WRMP24 documents (both August 2023) continue to identify that the Teddington DRA scheme is a key scheme for the delivery of water resilience in London in the short term, i.e. circa 2033 onwards. As these plans progress through to adoption, any adjustments that are relevant to the inclusion of any of the identified LWR SRO schemes will be integrated as necessary into the appraisal process.

4.25 Equally, to ensure that the development proposed is acceptable at the sites required to accommodate it, and in terms of achieving the most efficient and least impacting development footprint, the most direct route between the fixed locations for each scheme has been sought, then shaped and informed by the availability of land to support the delivery of the infrastructure required.

4.26 As a result, the appraisal methodology for the LWR SROs is necessarily limited to the consideration of criteria, features, characteristics, opportunities and constraints associated with the provision of major linear infrastructure development between predetermined points in a densely populated and developed urban context. In particular:

- for Beckton water recycling – consideration of available sites to serve a conveyance route from the London Borough (LB) of Newham, through the LB's of Barking and Dagenham, Redbridge, Waltham Forest, Haringey and Enfield;

- for Mogden water recycling – consideration of available sites to serve a conveyance route from the LB of Hounslow through the LB of Richmond Upon Thames, and terminating in the Borough of Spelthorne between Mogden STW and Walton Bridge, and the identification of a site for the provision of a new AWRP;

- for Teddington DRA – consideration of available sites to serve a conveyance route from the LB Hounslow, through the LB Richmond Upon Thames and into the Royal Borough of Kingston Upon Thames.

4.27 Land uses associated with each of the schemes and which are taken into consideration as part of Stage 2 include:

- for treatment and initial conveyance: the use of sites for the provision of AWRPs, TTFs; tunnel or pipeline drive shafts,
- for scheme route conveyance: the use of sites for the provision of intermediate shafts for the management of safe pipeline or tunnel bore lengths; sites for pipeline or tunnel spoil removal (during construction); routes for pipeline trenching; sites for the provision of pumping stations and for the provision of other above or below ground ancillary plant (if required);
- for conveyance reception, discharge and abstraction: the provision of a pipeline or tunnel reception shaft; site space for pumping stations and for the provision of other above or below ground ancillary plant (if required); the provision of sites for discharge outfalls; the provision of sites for abstraction including screens; the provision of any onward conveyance of abstracted flows or return conveyance of waste flows.

4.28 This stage appraises potential site areas identified through previously completed WRMP19 and RAPID

Gate 1 work to reach a view of whether those sites or areas should be progressed to the more detailed Stage 4 appraisal.

4.29 The appraisal process considers the use of any identified site or area of conveyance from both a construction and operational perspective. As part of that consideration, the appraisal team will exercise professional judgement to consider if that proposed use, and any impacts that might arise from it, would be capable of being mitigated through the assumed adoption of standard best practice measures, particularly during construction, or where new permanent development is proposed.

4.30 Examples of approaches to mitigation taken into account during Stage 2 include:

- Construction impacts would generally be managed though implementation of environmental mitigation and control documents by the construction contractor.
- Any vegetation clearance should be undertaken outside of the bird breeding season and would be supervised under an Ecological Clerk of Works (ECoW) arrangement. Root protection zones would be established to protect retained trees from works.
- Use of standard biosecurity measures (e.g. Defra Check, Clean, Dry https://secure.fera.defra.gov.uk/nonnativespecies/checkcleananddry/documents/check-clean-dry-england.pdf) particularly where works take place in or near water.
- Reference would be made to best practice construction methods to protect the environment, including 'Guidance for Pollution Prevention 5: Works and maintenance in or near water'.
- Night-time working should be avoided, and any new temporary or permanent lighting would be directional to avoid impacts.

4.31 Table 3 sets out the key criteria that will be used during the Preliminary Appraisal to establish if the site areas and areas of conveyance identified through Stage 1 for each LWR SRO should either be retained, adjusted and retained, or discounted from the process.

4.32 The criteria identified in Table 3 will be applied to each scheme using a Red-Amber-Green ('RAG') grading system. At this preliminary stage the judgments given for each grade are 'high level', meaning that the appraisal is seeking to identify the initial severity of any issues identified with each site and area of conveyance, but not necessarily to identify a detailed review of those issues and how they might be overcome: this will be undertaken at Stage 4 of the process following confirmation of the sites to be appraised under Stage 3.

4.33 To assign a RAG grade to each site and conveyance area, professional engineering, environment, planning, and land advisors within the project team will evaluate each scheme through desk top surveys applying professional judgement to the data and information collected for each site in relation to the criteria set out in Table 3.

4.34 The appraisal will be completed using publicly available GIS datasets to establish spatially constrained receptors, and assessing risk, based on proximity of the scheme. Where resources and time allows, site visits to the area in which potential sites or conveyance areas are located may be undertaken, although at this stage the appraisal is not reliant upon such visits being completed.

4.35 Where the appraisal identifies substantial adverse impacts, then alternative sections or sites in the vicinity will be investigated, again using desk top methods. Whilst it will be preferrable for such alternatives to be located in close proximity to the last acceptable section of route alignment or affected site, these investigations may necessitate consideration of alternative land some distance from the area of concern, and so necessitate a back check and further adjustment of preceding route sections to maintain an appropriate scheme or option. Accordingly, the scope of searching for such alternatives has not been quantified for the preliminary stage of appraisal.

4.36 For sections that include trenchless techniques, for example to pass below natural features or existing assets, the location of that trenchless section and its performance against the preliminary criteria will be considered alongside the construction requirements associated with that component, such as launch and reception sites (based on advice from the engineering team).

4.37 The results will be recorded in a matrix which will identify the RAG outcome from the application of the criteria to each alignment and its respective sites, and will provide a brief commentary on the appraisal of each criteria and an overall indication of the RAG status of each site by discipline. Where new issues are noted by the appraisal team that could impact on the outcomes for a given site, or that need to be applied to all sites, these will be applied through a process of backchecking the appraisal work, both whilst being undertaken and through Stage 3 of the process.

4.38 None of these RAG classifications will necessarily automatically exclude an option or its alignments and sites, indicating instead the potential presence or absence of important constraints and / or project risks relating to that option. This then informs the shortlisting process (Stage 3).

Table 3 Criteria for the Preliminary Appraisal

Criteria Name	Indicative Values			Derived from
	Red	Amber	Green	
Engineering				
Geotechnical conditions Impact on choice of alignment, constructing shafts, selecting appropriate depths. Difficulty ground conditions, e.g. running sands, significant ground movement, contaminated land	Significant geotechnical issues which may mean changing alignment is required. Significant impact on construction of tunnels or shafts. Significantly pipelaying difficulty. Potential for settlement and damage of existing structures.	Mitigation or additional measures required for construction. Extra investigations required to confirm solution.	No or limited constraints.	N/A
Impact of adjacent services/ infrastructure. High voltage (HV) overhead cables Buried pipes including gas & water. Telecoms Other tunnels Disruption to other infrastructure.	New infrastructure is within 5m of hazardous or critical existing buried services (i.e. high-pressure gas main, HV cable lines). Infrastructure cannot be diverted and any impact during construction would have significant detrimental &/or H&S impact.	Infrastructure crosses / is within 5m of medium to low-risk existing buried services. Within 20m of hazardous or critical existing infra but can be mitigated or diverted Mitigation/ diversion measures are straightforward.	No nearby services/ infrastructure. Works do not impact on other infrastructure	The Construction (Design and Management) Regulations 2015
Working Site –access and vehicle movements	Significant difficulties achieving access,, will impact construction and has severe detrimental third party impact.	Access can be achieved but compromise/ mitigation required and some impact during construction to third parties	Good access to site with low impact to 3rd parties	N/A
Ease of tunnel launch & recovery and removal of spoil	Significant difficulties launching tunnel due to site restrictions.	Will require compromise/ mitigation in order to be workable.	Tunnel launch can be easily achieved.	Tunnels and Pipejacking, guide for Designers, HSE.
Shaft and access spacing. General – maximum distance between shafts and access points during construction and for operation.	Safety is compromised due to lack of shafts over distance. Risk of lack of ventilation and / or insufficient access / egress points. In excess of current technology	Will require compromise between risks and costs. Increase in shafts can reduce risks but increase costs. Manageable increase in H&S risk. Within current acceptable technological limits.	Good balance between costs and risks.	Tunnels and Pipejacking, guide for Designers, HSE.
Operational- drain down and restart	Significant operational difficulties and costs in shutdown and restart of the scheme.	Will require planning and operational input to shutdown and restart the scheme when on standby.	No difficulties of shutdown and restart of scheme.	N/A

Criteria Name	Indicative Values			Derived from
	Red	Amber	Green	
Pipeline & tunnel operational and future access constraints	Significant operational issues. Difficult in access, shutdown and maintenance. Scheme cannot be upgraded and adapted.	Manageable operational issues. Operational access needs input and planning. Scheme may be upgraded but with additional costs and operational impacts	Easy access for future maintenance. Scheme can be adapted in upgraded easily	The Construction (Design and Management) Regulations 2015
Tunnel shafts – construction issues	Large site required. Significant constraints in terms of land availability, disruption, costs. Poor geology	Will require compromise/ mitigation in order to be workable. Potential ground condition issues. Access or egress issues	No or limited constraints.	N/A
Construction working width/ site compound size. Area within which the pipeline constructions will take place.	Insufficient working area leading to significant difficulties in construction and potential health and safety impact. Impossible to undertake construction safely.	Working width and site compound is constrained but mitigation measures and staging of works would ensure construction is feasible.	Sufficient working width. Site compound has adequate space. No or limited constraints.	N/A
Hydraulics design, sizing & operation Hydraulic grade line (HGL) – ideally minimise pumping and ongoing operation costs.	Significant head loss. Water conveyance severely disrupted. Scheme hampered by hydraulic constraints	There is head loss but mitigation measures (i.e. pumping stations) can ensure acceptability. Increased project costs.	Hydraulics work and future growth, expansion and operational costs minimised.	N/A
Site previous land use	Site requires significant and costly advance works to remove previous use features/ assets	Site requires some advance works to remove previous use features/ assets	Site has no previous use assets to remove	N/A
Site connection to utilities	Site has significant difficulties in providing utilities required and/or costs are very high	Site has some difficulties in providing utilities required and/or costs are moderate	Site has good potential for low cost provision of utilities required	N/A
Carbon impact	High carbon construction impact, ongoing high carbon operational impact	Medium carbon construction impact of solution, ongoing medium carbon operational impact	Low carbon construction impact of solution, ongoing low carbon operational impact	ACWG Design Principles, Process and Interim Guidance [Climate]
Capital cost	High capital cost of solution (relative to other options)	Medium capital cost of solution (relative to other options)	Low capital cost of solution (relative to other options)	N/A
Environment and Social				
Biodiversity, flora and fauna – designated sites	Within a Statutory International / National designated site for nature conservation	Within 100m of, or otherwise with the potential to affect the integrity of, a Statutory International / National designated site for nature conservation	Minor, neutral or positive impact	National Policy Statement for Water Resources Infrastructure paragraphs

Criteria Name	Indicative Values			Derived from
	Red	Amber	Green	
		OR Within a Statutory Local designated site for nature conservation		3.3.1-3.3.5, 4.3.7 and 4.3.13 NPPF paragraphs 180 – 182 ACWG Design Principles, Process and Interim Guidance [Place]
Biodiversity, flora and fauna – Ancient Woodland	Within 15m of an area of mapped Ancient Woodland	Within 100m of, or otherwise with the potential to affect the integrity of, an area of mapped Ancient Woodland	Minor, neutral or positive impact	National Policy Statement for Water Resources Infrastructure paragraphs 4.3.7 and 4.3.1 NPPF paragraph 180 ACWG Design Principles, Process and Interim Guidance [Place]
Soils – agricultural land	Infrastructure results in permanent loss of Grade 1 or 2 agricultural land	Infrastructure results in permanent loss of Grade 3a agricultural land	Infrastructure is on agricultural grades 3b or lower or non-agricultural land	National Policy Statement for Water Resources Infrastructure paragraph 4.10.14
Soils – landfill / contaminated sites	Within an active or historic landfill or recorded area of contamination	Within 250m of an active landfill or a historic landfill / recorded area of contamination	Over 250m from an active landfill or from a historic landfill / recorded area of contamination	National Policy Statement for Water Resources Infrastructure paragraph 4.10.9 NPPF paragraph 188
Water - Flood Zone	Within Flood Zone 3, or an area at High Risk of Surface Water Flooding	Within Flood Zone 2, or an area at Medium Risk of Surface Water Flooding	Within Flood Zone 1, or an area at Low Risk of Surface Water Flooding	National Policy Statement for Water Resources Infrastructure paragraphs 4.7.4-4.7.8 NPPF paragraph 167
Landscape	Within areas of outstanding natural beauty (AONB)	Within 100m of, or otherwise with the potential to affect the setting of an AONB	Minor, neutral or positive impact	National Policy Statement for Water Resources Infrastructure paragraph 4.9.2-4.9.6 NPPF – paragraphs 176 – 178

Criteria Name	Indicative Values			Derived from
	Red	Amber	Green	
				ACWG Design Principles, Process and Interim Guidance [Place]
Historic environment	Within a heritage designation (Listed buildings (all grades), conservation areas, Registered Parks and Gardens, Registered Battlefields, Scheduled Monuments, World Heritage Sites)	Within 100m of, or otherwise with the potential to affect the setting of, a heritage designation	Minor, neutral or positive impact	National Policy Statement for Water Resources Infrastructure paragraphs 4.8.7-4.8.10 NPPF paragraphs 199 – 208 ACWG Design Principles, Process and Interim Guidance [Place]
Population and human health – property and community assets	Permanent loss of property and community assets (schools, medical facilities, allotments, bowling green, cemetery, golf course, sports facility, play space, playing field, public park or garden, religious grounds, tennis courts)	Temporary loss / disruption to community assets during construction.	No permanent loss of property and community assets.	National Policy Statement for Water Resources Infrastructure paragraphs 4.10.10 and 4.13.3-4.13.5 NPPF paragraphs 92-95 ACWG Design Principles, Process and Interim Guidance [Place]
Residential property - construction impacts	More than 100 residential receptors, and ecological receptors, within 50m of scheme which could be affected by construction dust. Pipeline route predominantly through built up areas and / or likely to have substantial impacts on local traffic.	Between 10 - 100 residential receptors, and ecological receptors, within 50m of scheme which could be affected by construction dust. Pipeline route partly through built up areas and / or likely to have moderate impacts on local traffic. Impacts can be mitigated.	Less than 10 residential receptors, and no ecological receptors within 50m of scheme which could be affected by construction dust. Pipeline route largely not through built up areas and / or likely to have limited impacts on local traffic.	National Policy Statement for Water Resources Infrastructure paragraphs 3.9.2 and 4.2.3-4.2.4
Residential property - operation impacts	More than 300 residential properties likely to be affected during operation.	Between 100 and 299 residential properties likely to be affected during operation.	Less than 100 residential properties likely to be affected during operation.	ACWG Design Principles, Process and Interim Guidance [Place]
Planning				
Existing or designated use of site	Existing/designated land use within corridor section likely to preclude development	Existing/ designated use not ideal but mitigation measures would ensure acceptability	Existing/ designated use does not-conflict with use of site	Adopted Development Plan

Criteria Name	Indicative Values			Derived from
	Red	Amber	Green	
Emerging potential designated use, or evidence of land being promoted for development	Potential designated use or land promotion indicates high risk that development for alternative uses likely to preclude development	Potential designated use or land promotion indicates low risk that development for alternative uses likely to preclude development	No known emerging designations or land promotion	Emerging Development Plan
Mineral extraction	Route section intersects with an allocated minerals site	Intersects with a safeguarded site or zone	No minerals site or safeguarding zone	NPS W-R paragraph 4.10.16 and 4.10.28 NPPF paragraphs 210.c and 212
Green belt	Within the green belt	Adjacent to and affecting the setting of green belt	No or positive impact	NPS W-R paragraphs 4.10.13 and 4.10.26 NPPF paragraphs 147 - 151
Metropolitan Open Land (MOL)	Within MOL	Within MOL but situated on operational / developed land, or adjacent to and affecting the setting of MOL	No or positive impact	Development plan policy
Neighbouring land uses	Nature of surrounding land use likely to-preclude development	Nature of surrounding land use not ideal, but mitigation measures would ensure acceptability	Minor, neutral or positive impact	N/A
Planning Applications Granted (in last 3 years)	Permission granted and implemented/ pre commencement details approved and permission due to be implemented	Permission granted but not implemented / pre commencement details not approved	No permissions granted or applied for	Local Planning Authority planning registers
Property				
Special Category Land (commons/ parks and open spaces/ PRoW/ Allotments/ National Trust), **Defence Estates**, and Crown Land	Land comprises special land for the purposes of the Acquisition of Land Act 1981 or Crown Land	Land includes some special land for the purposes of the Acquisition of Land Act 1981 or Crown Land	Land does not include any 'special land' for the purposes of the Acquisition of Land Act 1981 or Crown Land	Planning Act 2008 CROW Act 2000
Acquisition costs	Acquisition costs likely to be relatively high. Due to land use type and number of 3rd party interests within the site.	Acquisition costs likely to be moderate. Based on land use and number of third-party interests	Acquisition costs likely to be relatively low. Based on land use and number of third-party interests	N/A

Criteria Name	Indicative Values			Derived from
	Red	Amber	Green	
Land ownership	Land purchase required of third-party land and high level uncertainty over acquisition likelihood OR complex leaseholds / tenancies / rights / occupation associated with the land holding	Land owned by Thames Water but some leaseholds / tenancies / rights / occupation may restrict development OR Land purchase required of third party land with fairly certain acquisition potential	Land is fully owned by Thames Water with no leaseholds / tenancies / rights / occupation that cannot be terminated	N/A

5. Stage 3: Confirmation of Sites for Detailed Appraisal

5.1 The Project Team will hold a workshop to review each of the LWR SRO scheme appraisal outcomes once the appraisal of that SRO has been completed under Stage 2. The outcomes of the Stage 2 appraisal for that SRO will be used to reach a decision as to whether or not site areas, and where applicable, areas of conveyance within each scheme, should be retained, or discounted from further consideration. This workshop will be attended by all contributors to the project appraisal process, including specialists from each of the following disciplines:

- Project lead
- Engineering
- Environment
- Planning
- Property

5.2 This stage will include consideration of possible alternatives where information obtained during Stage 2 indicates that a scheme may be generally feasible whilst also containing sites that are very constrained.

5.3 Adjustments to take into account either the removal of sites, where applicable, or identification of alternative sites may also lead to some changes to either the anticipated alignment for that scheme or the creation of alternative sub-sections for that alignment. Where this occurs and both alternatives are considered feasible both will be appraised further under Stage 4.

6. Stage 4: Detailed Appraisal of Sites

6.1 Taking as its starting point the outcomes from Stages 2 and 3, Stage 4 represents a more detailed appraisal of the retained sites and any newly identified sites within each LWR SRO scheme.

6.2 The clarity provided through Stage 3 enables Stage 4 to build on the initial criteria and outcomes gradings presented in Stage 2 by investigating in more detail how impacts might be addressed, possible points of mitigation, and possible adjustments to sites and their indicative layouts and / or use. Where possible benefits can be identified these will also be listed.

6.3 Whilst the criteria for Stage 4 will incorporate the key issues addressed under Stage 2, they will be expanded where appropriate by type, e.g. to consider issues such as air quality or noise, and also by range, i.e. to include consideration of transport criteria. These additional criteria reflect a wider range of issues that may be applicable to sites which have been judged by the appraisal team as meriting further consideration following the initial higher level appraisal at Stage 2 and which may, if selected for consideration beyond the appraisal process, go on to be the subject of environmental assessment and policy led assessment.

6.4 To inform the appraisal, the following information will be used:

- Publicly available datasets for example Natural England Sites of Special Scientific Interest GIS layer, Environment Agency flood mapping.
- NBN Atlas for protected species and Invasive Non-Native Species records.
- Borough Local Plan mapping tools
- RAPID Gate 2 Initial Environmental Appraisal (including initial assessments of water, aquatic and terrestrial ecology, historic environment, noise and air quality)
- RAPID Gate 2 Habitats Regulations Assessment.
- Preliminary Ecological Appraisal surveys undertaken by the project team at potential sites.
- Reference to technical guidance documents e.g. Institute of Air Quality Management Guidance on the assessment of dust from demolition and construction v1.1.
- Other webpages e.g. recreational facilities, 'Friends of' groups.

6.5 The appraisal of each criterion will, where relevant, summarise all key characteristics relevant to the site and criteria in question ('Description of Site Characteristics') and assess in sufficient detail any anticipated impacts likely to arise when that site is judged against that criteria ('Assessment Against Criteria').

6.6 Each assessor will also grade the significance of that relationship to help guide the project team's understanding of the significance of the range of issues identified for any site that might be delivered as part of the LWR schemes.

6.7 The grading for Stage 4 continues to use a 'RAG" process, with additional qualification against each grade in respect of the ability to manage and mitigate identified issues, as set out below:

RED	Mitigation can be achieved / policy or other land use / environmental issues can be overcome, but will be very challenging.
AMBER	Mitigation can be achieved / policy or other land use / environmental issues can be overcome.
GREEN	Criterion has no implications for site or mitigation can be achieved using good practice measures.

6.8 As with Stage 2 of the process the results of the appraisal process will be contained within a matrix and will be informed by the professional judgement of the team. As before, the presence of a 'red' grade or a number of such grades within the matrix is not an automatic indicator that a site should be excluded from the process.

6.9 Equally, as with Stage 2 of the process, the outcomes of Stage 4 of the process are not intended to

be quantitative whereby sites with a high combination of red or amber grades are ‘added up’ to indicate that a site should be removed from further consideration.

6.10 The use of the grading process is instead a means to illustrate those criteria for which beneficial, neutral, adverse and significantly challenging issues have been identified and which will require careful design, assessment and mitigation to ensure they are appropriate for delivery as part of any given LWR SRO scheme.

6.11 For example, it is possible that a site may have a number of red grades identified within its Stage 4 appraisal matrix indicating that delivery of works on that site will require very careful design and mitigation of impacts, yet it remains the most favoured or potentially the only available site option to deliver the infrastructure necessary for that part of the scheme being appraised.

6.12 Each site will be provided with a summary of the appraisal undertaken for each discipline, along with any noted recommendations that inform the final grade assigned to that site and how that judgment has been reached. If new matters or issues for consideration arise for sites or within disciplines as work progresses, these will be reviewed by that discipline and applied to the appraisal outcomes revised as appropriate. If necessary, such issues will also be backchecked against other Stage 4 sites to ensure consistency of appraisal.

6.13 The appraisal criteria for Stage 4 are set out below in Table 4.

Table 4 Criteria for the Detailed Appraisal

Appraisal Issue	Appraisal Criteria	Derived From
Engineering		
Geotechnical conditions	• Impact on choice of alignment, constructing shafts, selecting appropriate depths. • Difficulty of ground conditions, e.g. running sands, significant ground movement, Contaminated land • Site levels • Previous land use	British Geological Survey Web Portal LIDAR Data
Impact of adjacent services/ infrastructure.	• HV overhead cables • Buried pipes including gas & water. • Telecoms • Other tunnels • Disruption to other infrastructure.	Requested services data from local service providers Approach to local DNO providers
Working site (access)(all types of sites)	• Availability of rail connection/practicability of accessing rail connection • Suitability of road links to site and river • Ability for site to handle abnormal indivisible loads • Jetty / wharfage facilities available • Jetty / wharfage facilities can be created • Availability of any other means of access • Worker transport considerations	BS6164:2019 Health and Safety in Tunnelling in the Construction Industry - Code of Practice Construction (Design and Management) Regulations 2015 (CDM 2015)
Working site (construction) (all types of sites)	• Ability to accommodate all requirements on one site and if not describe how facilities can be achieved via a combination of sites. • Assessment of potential for effects from development upon existing site or adjacent services e.g., power supply/communications/other • Site size – suitable for intended use and construction of that use? • Site geometry – suitable for intended use and construction of that use?	TBM manufacturer (typical) site layout guidance Thames Water standard practice guidance Construction (Design and Management) Regulations 2015 (CDM 2015)
Shaft and access spacing.	• Maximum distance between shafts and access points during construction and for operation	Pipe Jacking Association Guidance (http://pipejacking.org/) Thames Water Codes of Adoptions - AM-DES-CIV-C03-SEC1
Construction compound	• Size • Working width	TBM manufacturer (typical) site layout guidance Thames Water standard practice guidance Construction (Design and Management) Regulations 2015 (CDM 2015)

Appraisal Issue	Appraisal Criteria	Derived From
Conveyance construction	• Ease of TBM launch • Ease of TBM reception • Ease of materials import • Ease of TBM removal • Ease of spoil removal • Ease of pipeline construction • Ease of trench construction	British Tunnelling Society. (2010). *Specification for Tunnelling Third Edition*. ICE Publishing Thames Water Codes of Adoptions - AM-DES-CIV-C03-SEC1 Thames Water Safety Standards Management of process arisings from tunnels and other earthworks – The Pipe Jacking & Tunnelling Research Group BS 6164:2019 Health and safety in tunnelling in the construction industry – code of practice Construction (Design and Management) Regulations 2015 (CDM 2015)
Operational	• Drain down and restart	Thames Water Specifications
Pipeline & tunnel	• Operational and future access constraints	Thames Water Specifications
Hydraulics design, sizing & operation	• Hydraulic grade line (HGL) – ideally minimise pumping and ongoing operation costs. Ensure head losses are appropriate.	Hydraulics and pump sizing calculations based on • Thames Water standard practice guidance • BS EN 752:2017 Drain and sewer systems outside buildings - sewer system management (Incorporating corrigenda October 2019 and February 2022)
Site connection to utilities	• Ability to provide all utilities required during operation	Utilities searches Approaches to local DNO
Carbon impact	• carbon impact of appraised option relative to alternatives.	RAPID Gate 2 carbon calculations. ACWG Design Principles, Process and Interim Guidance [Climate]
Capital cost	• Capital cost impact of appraised option relative to alternatives • Operation and whole life cost impact of appraised option relative to alternatives.	Thames Water F909 Estimation Tool
Environment		
Biodiversity, flora and fauna:	• European sites (e.g. SAC, SPA and Ramsar) and functionally linked habitat • National designated sites (SSSI, NNR) • Irreplaceable priority habitats e.g. ancient woodland • Priority habitats and protected species (terrestrial and aquatic) • Local (LNR) and non-statutory designated sites (SINCs) • Invasive and Non-Native Species (INNS)	Conservation of Habitats and Species Regulations 2017 (as amended) Conservation on Wetlands of International Importance (1971) (Ramsar Convention) Wildlife and Countryside Act 1981 (as amended) Environment Act 2021 The Protection of Badgers Act 1992 The Natural Environment and Rural Communities (NERC) Act 2006 – Section 41 Environment Act 2021

Appraisal Issue	Appraisal Criteria	Derived From
		The Eels (England and Wales) Regulations 2009 Salmon and Freshwater Fisheries Act 1975 (as amended); Water Resources Act 1991 The Countryside Right of Way Act 2000 UK Environment Bill 2020 Hedgerows Regulations 1997 The EU Regulation 1143/2014 on the prevention and management of the introduction and spread of invasive alien species. National Policy Statement for Water Resources Infrastructure paragraph 3.6.9, 4.3.5, 4.3.7, 4.3.9, 4.3.17, 4.15.18 National Planning Policy Framework paragraph 179, 180 - 182. CIEEM Guidelines from ecological impact assessment
Flood risk:	• Active floodplain, flood risk zones 2 & 3	National Policy Statement for Water Resources Infrastructure paragraphs 4.7.4-4.7.8 National Planning Policy Framework Paragraph 167 Application of the Sequential Test.
Water resource:	• Water features (surface, groundwater) • Water quality	Water Resources Act 1991 The Water Framework Directive (Standards and Classification) Directions (England and Wales) 2015 The Water Environment (Water Framework Directive) (England and Wales) Regulations 2003. National Policy Statement for Water Resources Infrastructure paragraphs 4.15.5-4.15.7. Conservation on Wetlands of International Importance (1971) (Ramsar Convention) Environment Act 2021 National Planning Policy Framework paragraphs 180 – 182.
Historic environment:	• Scheduled Ancient Monuments • Historic Parks and Gardens • Listed Buildings • Conservation Areas • Archaeology priority areas • Non-statutory assets	Ancient Monuments and Archaeological Areas Act 1979 Planning (Listed Buildings and Conservation Areas) Act 1990 National Policy Statement for Water Resources Infrastructure paragraphs 4.8.7-4.8.10 National Planning Policy Framework paragraphs 189-208
Soils:	• Agricultural land, farm buildings and enterprises • Landfill/contaminated sites	Environmental Protection Act 1990 Part 2A Town and Country Planning (development management Procedure (England) order) 2015 schedule 4(y)

Appraisal Issue	Appraisal Criteria	Derived From
		A green Future: 25-year plan to improve the environment (2018) National Policy Statement for Water Resources Infrastructure paragraph 4.10.9, 4.10.14 National Planning Policy Framework Paragraph 84, 174 and 183 Planning Practice Guidance for the Natural Environment Paras 001 and 002.
Landscape:	• National designations (AONB, National Park) • Local landscape designations and character • Visually sensitive viewpoints • TPOs and tree planting allocations	National Policy Statement for Water Resources Infrastructure paragraph 4.9.2-4.9.6 National Planning Policy Framework paragraphs 131 and 174-177 UK Government standing advice on TPOs.
Air quality:	• Air quality management areas (AQMAs) • Proximity to sensitive receptors	National Planning Policy Framework paragraph 185 and 186 GOV.UK Air Quality Guidance IAQM Planning Guidance National Policy Statement for Water Resources Infrastructure paragraphs 3.9.2 and 4.2.3-4.2.4
Noise:	• Proximity of sensitive receptors	National Planning Policy Framework paragraph 185 National Policy Statement for Water Resources Infrastructure paragraphs 4.11.7-4.11.2
Population and human health:	• Residential property • Community wellbeing, local resources and infrastructure[3]	National Policy Statement for Water Resources Infrastructure paragraphs 4.10.10 and 4.13.3-4.13.5 National Planning Policy Framework paragraphs 84 – 85, 92 – 97 and 98 – 102 IEMA (2020) Effective Scoping of Human Health In EIA.
Socio-economics:	• Local businesses, local employment opportunities	National Policy Statement for Water Resources Infrastructure paragraphs 4.10.10 and 4.13.3-4.13.5 National Planning Policy Framework paragraphs 84 – 85, 92 – 97 and 98 – 102 IEMA (2020) Effective Scoping of Human Health In EIA.
Recreation:	• Recreational and leisure facilities[4]	National Policy Statement for Water Resources Infrastructure paragraph 4.10.6 and 4.13.3-4.13.5 National Planning Policy Framework paragraphs 93 and 98 – 102 IEMA (2020) Effective Scoping of Human Health In EIA.

[3] For example Public open space, religious and cultural centres, town and retail centres, social clubs, healthcare facilities and services.
[4] For example sports fields, parks, cycle networks, national trails, children play areas, golf courses, skate parks, water activities, community gardens, allotments, PRoW, museums, amusement parks, zoos and wildlife sites, country parks.

Appraisal Issue	Appraisal Criteria	Derived From
Planning		
Land use	• Existing use • Designated use	Adopted Development Plan
Emerging use	• Emerging designation • Evidence of land being promoted for development	Emerging Development Plan
Mineral extraction	• Minerals safeguarding area • Minerals site allocation • Application for mineral extraction • In use for mineral extraction	NPS W-R paragraph 4.10.16 and 4.10.28 NPPF paragraphs 210.c and 212
Metropolitan Open Land (MOL) / Green belt	• Assessment against green belt and Metropolitan Open Land Policy	NPS W-R paragraphs 4.10.13 and 4.10.26 NPPF paragraphs 147 - 151 Development plan policy
Neighbouring land uses	• Sensitivity of adjacent land use • Proximity of neighbouring use • Amount	N/A
Planning applications / permissions granted (in last 3 years)	• Application expected • Awaiting determination • Unimplemented but granted in last 3 years	Local Planning Authority planning registers
Property		
Parks and open spaces	• Ownership status • Presence or absence? • Potential for acquisition or rights to develop • Operational access / status	HM Land Registry Section 131 and 132 Planning Act 2008 Local Authority Data DEFRA Magic Maps
Public rights of way	• Ownership status • Presence or absence? • Potential for acquisition or rights to develop • Operational access / status	Local Authority Data Section 136 Planning Act 2008
Allotments	• Ownership status • Presence or absence? • Potential for acquisition or rights to develop • Operational access / status	HM Land Registry Local Authority Data Section 131 and 132 Planning Act 2008
National Trust land	• Ownership status	HM Land Registry

Appraisal Issue	Appraisal Criteria	Derived From
	• Presence or absence? • Potential for acquisition or rights to develop • Operational access / status	Section 130 Planning Act 2008 National Trust Open Data
Common land	• Ownership status • Presence or absence? • Potential for acquisition or rights to develop • Operational access / status	HM Land Registry Section 131 and 132 Planning Act 2008 Natural England Records DEFRA Magic Maps
Crown Land and Special Land	• Ownership status • Presence or absence? • Potential for acquisition or rights to develop • Operational access / status	HM Land Registry Section 135 Planning Act 2008 Crown Estate Records
Defence Estates	• Ownership status • Presence or absence? • Potential for acquisition or rights to develop • Operational access / status	HM Land Registry Section 135 Planning Act 2008 MoD Land Holdings
Estimated acquisition costs	• Is the site owned by TWUL • In single 3rd Party ownership • Multiple 3rd Party ownerships? • Compensation requirements?	HM Land Registry
Land ownership	• Is the site owned by TWUL • In single 3rd Party ownership • Multiple 3rd Party ownerships?	HM Land Registry
Transport		
Connection to rail network during construction	• Connection to railway siding • Suitability of interconnecting access route	N/A
Water freight practicability during construction	• Location of wharf • Suitability of interconnecting access route to wharf	N/A
Suitability of road / interconnecting road access during construction	• Road layout / width • Junction geometry suitability for Heavy Goods Vehicles	N/A
Sensitivity of access route during construction	• Residential streets • Shopping streets	N/A

Appraisal Issue	Appraisal Criteria	Derived From
	• Tourist areas, schools • Play areas • Hospitals • Bus route	
Operational transport and access requirements	• Is permanent and regular access needed after completion of construction? • Location of site suitable for future operational and maintenance access.	Thames Water Standard practice guidance

7. Stage 5: Workshop, Outcomes Reporting and Consultation

Workshop

7.1 The detailed outcomes from Stage 4 of the appraisal for each LWR SRO scheme will be reviewed by the appraisal team through an inter-disciplinary workshop. The outcomes of that workshop discussion will in turn inform the recommendations of the appraisal team as to whether a site could continue to play a role in the scheme being appraised, or whether a site should be removed from further consideration.

7.2 Where a site is one of a number of alternatives for a particular identified purpose, the workshop will aim to identify if a particular alternative site performs sufficiently more strongly than its counterparts to enable it to be recommended as being the optimal site for that use.

7.3 Regard will be had to the engineering and design requirements of any recommendations, particularly where a change to a site in one location may influence the ability to maintain appropriate pipeline construction to a shaft or asset site in another location.

7.4 As with the Stage 4 appraisal process which generates the initial summaries to be presented at the workshop, the inter-disciplinary review undertaken at the workshop will be informed by the professional judgment of the appraisal team and its consideration of all appraisal outcomes site by site, discipline by discipline.

7.5 As explained in section 6 above, it is not the case that sites will be weighted by the number of red, amber or green outcomes assigned to them, but instead by the nature of the issues that have informed any given grading and the collective opinion of the appraisal team in respect of that site's suitability to proceed further.

7.6 Where indecision arises through the workshop process further technical meetings may be needed, e.g. to discuss further a particular characteristic of a site, or the implications of changes to site locations and alignments. These discussions will be tailored to include those disciplines relevant to the issues raised and any adjustments to the appraisal outcomes will be made within the appraisal matrix for that site. The matrix for each site will therefore remain 'live' until the appraisal team concludes its discussions through this process.

Outcomes Reporting

7.7 The outcomes of the appraisal process across all stages will be presented in a site appraisal report for each LWR SRO scheme being appraised.

7.8 The report will identify those sites that have performed sufficiently strongly against the appraisal criteria, particularly through Stage 4, to remain as possible site options for the scheme being appraised. It will also identify those sites considered to represent an optimal option where they relate to a group of alternatives for a particular use.

7.9 Reserve sites, those that perform sufficiently well against the appraisal criteria to not be recommended for removal from the process whilst not representing the optimal location for the site purpose in question, will also be identified and retained for ongoing consideration for each scheme.

7.10 The site appraisal report will also identify those sites that have not been identified as feasible or representing the most appropriate means for the delivery of the scheme appraised and that are recommended for removal, explaining the key judgments made in that regard.

7.11 From these potential site combinations, alignments may be able to be identified and presented for

consideration, including through consultation as outlined below.

7.12 The report will be produced and peer reviewed by all members of the appraisal team to ensure that the outcomes of the process from each appraisal stage have been correctly represented.

Consultation

7.13 The outcomes of the appraisal process for any LWR SRO scheme appraised will be made available for consultation with technical stakeholders and local communities as part of the process of developing the proposals and associated design and assessment work for that scheme.

7.14 In particular, where feedback is received for any scheme being progressed, this will be reviewed and where necessary revisions made, or further appraisal checks undertaken.

7.15 The outcomes from the appraisal process for each LWR SRO scheme will inform the initial shaping of the proposed scheme and its potential impacts and effects.

7.16 In turn, this will be used to inform and guide any necessary screening and / or scoping to be carried out under the relevant Environmental Impact Assessment Regulations, as well as relevant topics and issues to be addressed in further detail by the design, engineering, environment, planning, land assembly and transport teams in preparing the technical evidence base that is necessary to support a future application for planning consent.